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The MEADOW Guidelines

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The MEADOW Guidelines

The MEADOW Guidelines propose a measurement framework for collecting and interpreting internationally harmonised data on organisational change and its economic and social impacts for both private and public sector organisations. Reliable harmonised statistics on organisational change would provide the basis for effective benchmarking through the exchange of information on best practices across EU-member states and in this way could contribute directly to the success of European policy initiatives aimed at increasing the flexibility and adaptability of organisations and employees while simultaneously improving the quality of jobs during economic booms as well as downturns.

The MEADOW project (MEAsuring the Dynamics of Organisations and Work) is a European Commission funded Coordinating Action that brought together a multi-disciplinary consortium of 14 partners from 9 European countries. The Meadow consortium has been actively supported by a number of key European and international institutions with central responsibilities for data collection and dissemination, including the OECD, EUROSTAT, the European Foundation for the Improvement of Living and Working Conditions, the European Agency for Safety and Health at Work, and DG Employment. MEADOW has been funded by the European Commission under priority 7 (Citizens and Governance) of the 6th RTD Framework Program.

<http://www.meadow-project.eu/>

The MEADOW Guidelines

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Introduction: objectives and scope of the Meadow Guidelines

There is a growing consensus among policy makers all over the world that knowledge has become of great importance for wealth creation and that innovation is a key driver of economic growth. The reasons for this are varied, including the perception that the rapid diffusion of ICT has increased the knowledge intensity of production and the view that processes of globalisation have resulted in a more rapid pace of innovation requiring a more continuous renewal of the knowledge base.

The knowledge-based perspective is now widely accepted as providing a broad framework for the design of economic policies and has been adopted by the European Commission and by such international organisations as the OECD. Knowledge policies have traditionally recognised the key role of research and development (R&D) and skilled scientists and engineers in successful knowledge development and international benchmarking exercises comparing the performance of Europe with the economies of the United States and Japan have typically focussed on lags in terms of these science and technology indicators. A similar focus on science and technology development can be seen in such rapidly developing nations as China, Korea and India, where policies are being put in place to promote an indigenous innovation capacity.

Alongside the traditional emphasis on research and development and investments in third-level science and technology education within the European Union knowledge policies have been cast in a broader social framework giving recognition both to the importance of developing skills at all levels of the enterprise and to the impact of knowledge development and use on social cohesion and inequality. This broader social perspective was the starting point for the 2000 Lisbon agenda which set the goal for Europe *'to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion'* (Lisbon European Council Conclusions, March 2000).

This goal of combining economic and social objectives is central to the European Strategy for Growth and Job. The Integrated Guidelines for Growth and Jobs (2008–2010) which set policy targets and benchmarks place emphasis on “tapping synergies” between economic, social and environmental policy goals. Policy objectives in the areas of R&D, innovation and ICT are formulated in an explicitly transversal manner with respect to those in the areas of labour markets, work organisation, the quality of jobs, and education and training. Lifelong learning is seen as integral to a wide range of economic and social objectives and in particular, it is a cornerstone of the revised Lisbon's strategy on achieving 'flexicurity' where the goals of flexible and adaptable enterprises and employees are combined with those of employment security and reduced labour market segmentation.

Knowledge-based policies depend critically on having the information to construct relevant indicators as a basis for analysis and for monitoring nations' progress in achieving specific objectives. Within Europe, where many key areas of policy fall under the competence of individual Members States, jointly established measuring instruments play a crucial role in coordinating national policies around common European goals in a manner that respects the principle of subsidiarity. The European 'open-method of coordination' depends on having harmonised data and indicators as a basis for comparing Member States progress in translating European guidelines into national and regional policies that take into account national and regional differences. This underlies the considerable investments made by the EU in infrastructure for the development of harmonised data and measures over a wide range of policy fields including labour markets, living conditions and welfare, information society statistics, and science and technology.

The MEADOW Guidelines take as their starting point the need for guidelines for collecting and interpreting data on the dynamics of organisations and work that are complementary to the standards of existing harmonised surveys that provide relevant information on the characteristics of organisations. At present, however, there exist no harmonised survey instruments specifically designed to collect information on organisations and organisational change. Our knowledge, especially from a comparative perspective, about the internal organisation of firms and organisations is fragmentary and incomplete and at present we lack the information needed to deepen our understanding of the impact of the use of different organisational practices or processes of change on enterprise performance and employee outcomes. Reliable harmonised statistics on organisations and organisational change could contribute directly to the quality of EU policy initiatives aiming at increasing the flexibility and adaptability of enterprises and employees while simultaneously improving the quality of jobs.

The Scope of the Guidelines

Organisational states and organisational change

The MEADOW Guidelines set out guidelines for collecting and interpreting information on both organisational states and organisational change. The Guidelines are concerned with collecting data at the workplace and employee levels. In practice, by aggregating individual data, it will be possible to construct relevant sector or national-level indicators of states and change.

The objective of providing information both on organisational states and on processes of change is dictated by the information needs of both policy makers and analysts. A central issue in organisational theory is the relation between the internal organisation of the enterprise or workplace and its economic performance. A basic question concerns the relative merits of more or less decentralised organisational structures in different environmental settings. Further, as discussed in more detail in Chapter I, there is an important literature focusing on the performance effects of adopting 'new' organisational practices. Here, implicitly or explicitly, the interest is on assessing whether the adoption of management practices and forms of work organisation corresponding to well iden-

tified organisational types (e.g. ‘taylorist’ vs. ‘learning organisation’) can be associated with different performance outcomes. The MEADOW Guidelines provide relevant definitions and indicators for capturing general characteristics of organisations such as the nature of authority relations and the method of coordination and control. It also provides relevant definitions of new business practices designed to increase flexibility, employee commitment and performance.

Knowledge-based theories emphasise the way changes in the economic and institutional context require firms to be more adaptable and innovative than in the past. Globalisation, deregulation and intensified competition require firms to innovate new products and processes more continuously and they require firms to adapt to changes in the geographical location of markets. During economic downturns, this pressure becomes even stronger as the survival of the organisation is at stake. This is why observers sometimes emphasise the virtues of bad times. But organisational changes also occur in prosperous times, backed up by the availability of slack resources. Such dynamic or adaptive capabilities at the levels of technology, product development and markets often require complementary change in organisational practices and methods, and for this reason there is great theoretical interest in the extent and nature of organisational changes and their relation to economic fluctuation. Here, the objectives of the MEADOW Guidelines are complementary to those of the 3rd version of the Oslo Manual which proposes indicators for collecting data on organisational innovation. The MEADOW Guidelines provide the basis for capturing much needed detail on the direction of organisational change. They also consider the advantages and drawbacks of retrospective questions versus panel surveys as methods for measuring change and providing recommendations for fruitfully combining these methods in a cost effective manner allowing to cover adequately the time line.

Capturing organisational states is of paramount importance for policy-makers and measures of organisational change that are not linked to measures of initial states can lead to mistaken policy evaluations. Measures of rates of change unconnected to initial states can give the impression of stagnation or inertia when in fact the relevant changes were implemented prior to the survey reference period. Policy-makers are often interested in identifying best-practices or a set of best practices as a basis for setting targets and for judging the progress of nations and regions in achieving them. Such targets can be quite general and can serve as basis for national or regional specific policies that take into account particular features of the local context. Achieving greater flexibility or adaptability of enterprises and employees is a general target of this nature and the MEADOW Guidelines provide definitions as a basis for constructing relevant indicators.

Linked employer/employee surveys

The MEADOW Guidelines consider a survey that links the interview of an employer with the interviews of his or her employees as the richest survey setting for measuring organisational change and its social and economic impacts. Some aspects, such as the way existing organisational arrangements or processes of change are experienced and felt by employees, can only be captured with accuracy by directly interviewing the employees concerned. Other aspects, including general information about the organisation’s choice of policies and practices affecting the internal division of labour or relations with external suppliers or subcontractors are best measured at the employer-level.

Linked surveys can provide different and complementary information on the same organisational characteristics or processes. For example, at the theoretical level, there is great interest in the type of mechanisms used by enterprises to coordinate decision-making in distributed tasks; and typologies of organisational designs are often based on differences in the type of coordination mechanism. At the employer level, it is very difficult to measure the use of different coordinating mechanisms directly, though indirectly one can learn much by collecting information on the degree to which decision-making authority is delegated to operators or on the relations of authority between different departments and services. At the employee level, it is possible to collect information directly on the use of different types of coordinating mechanisms, notably by asking employees to indicate whether their work pace is directly determined by such factors as their boss or supervisor, or to indicate the need to respect quantitative production norms, or the automatic movement of machinery and materials.

The research and policy relevance of linked employer/employee survey data are discussed in more detail in Chapter I. At the same time, it is important to consider ways of reducing the costs associated with the increased complexity of data collection that linked surveys entail, and Chapter II of the Guidelines makes recommendations in this respect.

Economic and social performance outcomes

Linked employer/employee surveys also provide a means of collecting different and complementary information on the outcomes associated with different organisational states and processes of organisational change. At the policy level the *performance effects* of adopting specific organisational forms and practices is of central concern and there is an important theoretical and empirical literature on organisational complementarities focusing on the *performance effects* of combining set of organisational and human resource practices. A wide range of performance related outcomes are of interest including financial performance, productivity growth, growth in sales and employment and innovative performance. Indicators of performance can be collected through organisational surveys both by means of quantitative and qualitative information. General data pertaining to turnover and employment and their change over the reference period can be collected at the employer-level. Innovation data on the development of new products and processes can similarly be collected for the reference period at the employer-level. Productivity measures may require the use of other sources such as matched register data.

Employee-level surveys are clearly well-placed to collect information on the *quality of working life*. The quality of work is a multi-dimensional concept and while the MEADOW Guidelines do not address these outcomes exhaustively they do propose standards for measuring employees’ experiences and outcomes at the workplace such as job satisfaction and well-being, physical and cognitive demands of work, job security and careers, skills development, pay and work-life balance. The Guidelines do not provide guidance for collecting data on health and safety issues.

The European Strategy for Growth and Jobs places emphasis on benefiting from potential synergies between economic and social policy objectives and a central question raised at the level of both policy and theory is whether organisational practices and methods that are beneficial in terms of enterprise performance may also prove beneficial in terms of employee satisfaction and well-being. Knowledge-based economies thrive on the capacity of firms and employees to learn and adapt to changes in technology, products and markets. As further discussed in Chapter I, the empirical literature focusing on issues of extrinsic and intrinsic motivation of employees provides evidence that work settings combining high learning and problem-solving with high levels of employee autonomy are perceived as intrinsically rewarding. Karasek's (1979) job demand and control model comes up with a related conclusion in arguing that high cognitive demands at work tend to be stress producing when they are not combined with high levels of employee control. This points to a complex set of interactions, where under certain circumstances enterprise performance and good outcomes for employees prove mutually reinforcing. To identify such patterns is of crucial importance for the realisation of European policy objectives where emphasis is given to both growth and social cohesion. Linked employer/employee surveys are well suited to collecting data on these issues and thus respond to the information needs of policy makers and researchers.

Organisational context and drivers of change

Organisations operate in particular economic and institutional contexts and one of the principal conclusions of organisational design theory is that good practice is conditioned by context. A common view is that current changes associated with globalisation, intensified competition and the diffusion of new information technology drive organisational change in the direction of more flexible organisational arrangements designed to promote competence building and innovation. These micro-responses in turn contribute to more volatility in markets and greater diversification of products. While organisational surveys provide the means for collecting information on how firms are responding to changes in markets and technology they cannot measure macro or sector-level changes except as they are experienced by the respondents.

Work on national innovation systems and on the varieties of capitalism points to the way common changes at the global level are mediated by nationally specific institutions and arrangements resulting in considerable diversity in firm behaviours. This resonates with the emphasis on subsidiarity and local diversity in the European 'open method of coordination.'¹ National differences in education systems, labour markets, industrial relations and financial institutions can result in different capacities for adapting to change and lead to preferences for particular organisational solutions. These context conditions are of central importance for correctly interpreting observed disparities in the adoption of different business practices across nations. The Guidelines set out standards for collecting basic information on the characteristics of markets, technical change and policy regulations in the areas of health and safety and the environment.

The public sector

There is a growing focus on how to reform public sector organisations so that they become more market oriented, assuming that this leads to more efficiency in terms of serving the needs of citizens, customers and clients at low costs. This is related to the modernisation agenda in the public sector, influenced by New Public Management (NPM) which advocates performance measures for the efficient use of resources and personnel in public sector organisations comparable to those in the private sector. The common objectives of many management practices, the use of Information and Communication Technologies (ICTs) and the aging of the workforce in both public and private sector organisations mean that a common survey instrument can provide relevant information on organisational changes for the entire economy and this is the approach adopted in the MEADOW guidelines. At the same time, organisations in the public sector are exposed to a transformation pressure emanating from the political system; as well as to pressures from the changing demands of citizens around such issues as access to education and training and work-life balance. These differences in context and drivers will give public sector organisations distinct characteristics which could be the focus of a specialised survey module applied on a periodic basis.

The gender dimension

Gender issues have been the focus of international agreements and policies, for example in the World Trade Organisation and the European Union. Gender equality is both a fundamental right and a common value of the European Union, and a necessary condition for achieving EU objectives in the areas of growth, employment and social cohesion. The *Roadmap for Equality between Women and Men*, adopted by the European Commission in March of 2006, focuses on several aspects of gender in working life.

The MEADOW Guidelines propose indicators for collecting data on the share of women in the workforce and the share of managers that are women. This information can be used to measure differences in forms of work organisation according to the gender composition of the workforce and it can be used to explore differences in the extent to which men and women are exposed to specific types of changes with consequences for the quality of working life, including pay and work-life balance. Power relations between men and women and gendering processes are central aspects in gender theory. While both these aspects are relevant in empirical studies of organisational change, it is very difficult to ask employers and employees directly about these phenomena as they are more or less immanent. The analysis of gender processes and power relations can best be pursued through the use of complementary case study methods designed to facilitate the discovery of structures and processes in the organisation that have an impact on work practices and the individual behaviour of men and women.

Complementarities with other international standards and harmonised survey instruments

The MEADOW Guidelines are complementary to other existing manuals that provide guidelines for internationally harmonised survey instruments. These include the Oslo

Manual, which provides guidelines for collecting innovation data, the EU Continuing Vocational Training Manual, and the Methodological Manual for Statistics on the Information Society.

The *Oslo Manual* prepared jointly by Eurostat and the OECD provides guidelines for the collection and interpretation of data on innovation. The first and second versions of the Manual focused on technological product and process (TPP) innovation. The perception that this focus was inadequate for capturing innovation processes in the service sector resulted in an expanded definition of innovation in the third version of the Manual to include non-technological innovation. Definitions were provided of two additional types of innovation: marketing innovations and organisational innovations. An organisational innovation is defined as, “the implementation of a new organisational method in the firm’s business practices, workplace organisation or external relations.” The Manual provides examples of innovations in business practices, workplace organisation and external relations. The 2008 wave of the Community Innovation Survey asks whether the enterprise introduced any of these types of organisational innovations over the previous three years and it collects information on the objectives for the enterprises’ organisational innovation.

A limitation with the Oslo Manual framework for measuring organisational innovation is that it doesn’t provide the basis for capturing organisational states in terms of such key elements as the degree of centralisation of decision-making, the specialisation of tasks, or the system of coordination and control. Consequently, the data cannot be used to identify best practices across EU-member nations as a basis for benchmarking or setting targets. Moreover, since the measures of change are not accompanied by measures of the initial state, the results may give a misleading impression of stagnation or non-innovativeness in cases where the organisation introduced changes prior to the reference period. The indicators and questions proposed in the MEADOW Guidelines respond to these limitations.

The *Methodological Manual for Statistics on the Information Society* provides guidelines for conducting enterprise and household ICT surveys. The enterprise survey included measures of computer usage, internet access, e-commerce via internet or non-internet computer network, employment of ICT specialist and training provided to ICT specialist and users. The household survey proposes separate modules with indicators measuring access to the internet, different possible uses of the internet, barriers to a more extensive use of the internet, use of computer and mobile phones, participation in e-commerce, training for ICT use and the level of e-skills.

There is an extensive literature on organisational complementarities demonstrating that the effective use of information and communication technologies in enterprises is dependent on complementary investments in new forms of work organisation and training. While the existing Community enterprise ICT survey captures the provision of ICT related training and the level of ICT skills, the organisational dimension is missing. The MEADOW Guidelines provide the means for opening up the black box of ICT use in the firm by relating types of ICTs and ICT skills to the business practices implemented and to the nature of work organisation.

The *EU Continuing Vocational Training (CVT) Manual* proposes indicators for measuring the vocational training provided by enterprises for their employees. The Manual distinguishes between CVT course and other forms of CVT. Two types of CVT courses are distinguished: internal courses and external courses. These refer to relatively formal forms of CVT that are based on formal curricula. Other less formal forms of CVT include on-the-job training, job rotation and exchanges, participation in quality circles, attendance at workshop and trade fares, and a category referred to as “self-directed learning”. Self-directed learning occurs when an individual engages in a planned learning initiative where he or she manages the training time and the place at which the training takes place. Self directed learning means planned individual learning activities using one or more learning media. Such learning can take place in private, public or job-related settings and might be arranged using open and distance learning methods.

The focus in the CVT Manual is on planned training activities. However, the literature on organisational learning emphasises that many relevant skills are acquired through practical work experience rather than through structured and planned training activities. The MEADOW employee-level survey includes questions that can be used to capture learning and skills development through daily work activity and combined with questions on the use of specific management practices in the employer questionnaire these questions can be used to build-up measures for the use of learning organisations.

Structure of the MEADOW Guidelines

The goal of the first chapter of the MEADOW Guidelines is to set out a framework for the design of surveys on organisations and organisational change resulting in data that are relevant for both theory and policy. It develops a *measurement framework* on the basis of a systematic study of both existing surveys and a broad set of theories, which then serves as the MEADOW Guidelines’ basis for selecting relevant indicators for questionnaire design. Chapter II then proposes and justifies a *general survey framework* for measuring the dynamics of organisations and work based on the experiences accumulated at an international level over the past twenty years. As proposed in chapter I, a survey that links the interview of an employer with the interviews of his or her employees is considered as the richest survey setting for evidence based policy and research purposes. Chapters III and IV develop indicators for the employer and employee level survey instruments respectively on the basis of the concepts developed in Chapter 1. Core employer and employee questionnaires are presented in the appendices to these chapters. Finally, the practicalities of administering the *general framework* for a linked survey of employers and employees are discussed thoroughly in chapter V. The appendix of the MEADOW Guidelines synthesises the main results of the cognitive testing of the employer and employee level questionnaires that took place in eight European countries.

Chapter I

Organisational theory and measurement framework

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I. Introduction

Organisations and organisational change in the private and public sectors are central to the welfare of citizens. This holds whether we think of business firms, health agencies or educational institutions. In this context the management of organisations and organisational change is of paramount interest as regards both sustainable economic growth and improvements of working conditions. In a policy perspective this means that it is essential for policy makers to learn about the drivers of organisational change and how to distinguish between different organisational designs in order to promote those with a positive impact upon productivity, competitive strength, and the quality of jobs.

Effective policy making depends on theory to identify the relevant variables and the causal relations between them. The development of indicators on the basis of surveys is crucial to carrying out empirical tests that can legitimise particular policy objectives and targets. Policy outcomes and related empirical information can then feedback to theory by raising new problems and questions. This chapter presents an overview of a broad range of theories of organisations and organisational change that have been drawn upon in constructing a measurement framework to guide the choice of indicators in the MEADOW survey design. The chapter identifies areas that are appropriate for investigation through survey data and it concludes by highlighting the research and policy relevance of a linked employer-employee survey setting for capturing the dynamics of organisations and work.

II. The Basic Measurement Framework

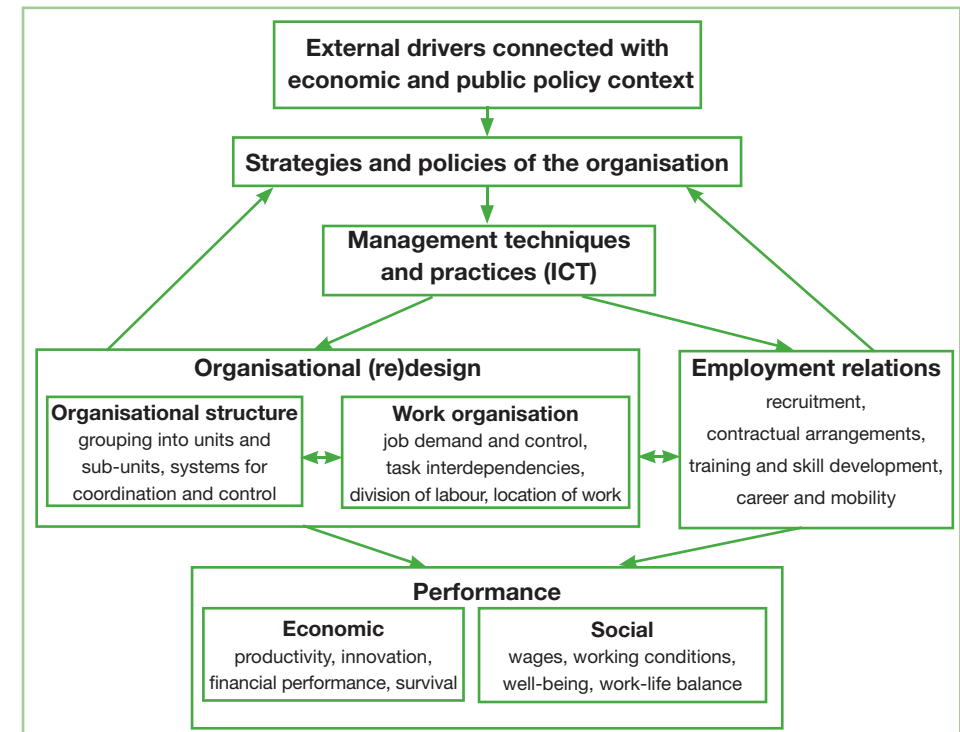
Figure 1 presents the basic measurement framework used in the MEADOW Guidelines. The framework is based on an overview of major theories of structure and change in public and private organisations¹ as well as a background report on the state of art in surveys of organisational change². The framework draws attention to the driving forces behind organisation change, the way management policies, practices and techniques shape the organisational design which in turn affects performance and employee outcomes. The figure can be interpreted from two perspectives: (1) From the perspective of the individual organisation, the target of an employer survey, and (2) from the perspective of the employees as members of the organisation and living with the social consequences of it, the target of an employee survey.

Organisations must for all practical purposes be seen as open systems functioning in a more or less complex and dynamic environment. The top box of figure 1 highlights the **external** forces that affect the internal policies of the organisation that shape its structure and work organisation. Key aspects of the external context to be addressed in accounting for changes in organisations are those connected to change in global *competition and technology* as well as changes in public policy regulations, notably in the areas of labour markets, education, health and safety, and the environment.

¹ See: "Multilevel theoretical framework", Meadow background document n°1, http://www.meadow-project.eu/images/docmeadow/backdocument_mtf.pdf

² See: "Grid Report: State of the art in surveys of organisational change", MEADOW background document n°2, http://www.meadow-project.eu/images/docmeadow/back_gridreport.pdf

Figure 1: Basic Measurement Framework



The relationship between context and organisation is not an automatic one regardless of whether the focus is primarily on the context as an opportunity for, or a constraint on, management's policy choices. The **policies of the organisation** will determine how external influences are mediated into the organisation and to what extent there are feedbacks to the environment. Organisational policies in the areas of interfirm collaboration, technical change, job design, and human resource development lead to the adoption of specific **management practices and techniques** understood as models of organised decision making, used by managers to rationalise their actions. Employee participation in management's decision making and the state and development of information and communication technologies (ICT) play significant roles in this set of relationships. ICTs are tools (equipment or software) used to produce, process, transmit and store information.

Management's practices in turn shape the **organisational design** and the system of **employment relations**. Organisational design is understood as the interconnected elements of organisational structure and the organisation of work. The system of employment relations defines the kind of membership to the organisation that employers offer to employees. The redesign of these components has feedbacks to organisational policies and interacts with the environment. The MEADOW Guidelines are designed to measure both organisational states and changes and this results in an emphasis on such concepts as 'dynamic capabilities', flexibility and 'learning organisations'.

Organisational structure refers to the grouping of people, tasks and objects (like equipment or buildings) into sub-units and business functions, and the systems to ensure coordination and control both horizontally and vertically within the boundaries of the organisation and outside these boundaries, with suppliers, customers and other business partners. The key features comprise the division of labour, coordination mechanisms, authority relationships and control. They are central to how management governs and changes the organisation and how the employees experience their working conditions and possibilities for personal development. The research literature shows that key elements of the organisation can be combined in various ways, leading to different types of organisational designs and related outcomes.

Work organisation refers to how work is actually divided into tasks, the bundling of tasks into jobs and assignments, the interdependencies between workers in performing the job, the job demands and the degree of control over the work done. Complementary to these work arrangements are found elements defining a system of **employment relations** which identify the kind of membership to the organisation that employers offer to employees. This includes choices to be made regarding recruitment, contractual arrangements, skill development and training, and careers and mobility.

The elements of organisational structure and work organisation in combination with various aspects of employment relations determine the organisation's **social and economic** performance. Economic performance is here defined in terms of increases in the competitive advantage of *private organisations* on markets. Resource use, quality of services delivered to the citizen and innovation are three important dimensions of economic performance in *public organisations*. The social performance of organisations, whether public or private, contributes to securing employment, as well as the quality of jobs, health and work-life balance and not least how organisations shape gender relations. Economic and social performance may then feedback into the external context and the public policy context.

In the following, the elements of the MEADOW measurement framework are further de-veloped in relation with theories.

III. Theories of organisations and organisational change

Our current understanding of organisations and organisational change draws on research from many disciplines, including economics, industrial sociology, psychology, organisation studies, management science and labour studies. Similarly, our knowledge is based on different paradigmatic approaches for gaining knowledge (see e.g. Ackroyd, Batt, Thompson, and Tolbert, 2005). The MEADOW Guidelines aim to be theoretically pluralist in the sense that surveys designed on the basis of the Guidelines should result in data relevant to testing hypotheses from a range of theoretical approaches. At the same time, the selection of theories discussed in this chapter reflects the intention to create a basis for public policy through survey data on organisational characteristics and organisational change. This is reflected in a certain bias in favour of theories that assume that organisations can be planned and managed in order to realise goals and

objectives. Little weight has been given to theories describing organisations as social-psychological phenomena, cultures, shared meanings or arenas for sense-making.

The theories and theoretical approaches addressed include the following levels and dimensions of organisations and organisational change :

- Organisational context and socioeconomic drivers of change
- Management practices and techniques
- Organisational structure and work organisation
- Organisational design and redesign
- Employment relations
- Organisational performance: Economic and social

III.1 Organisational context and socioeconomic drivers of change

There are many theoretical contributions arguing that the environmental context and external drivers of change are crucially important to organisations. *Contingency theory*, *open system theory* and *organisational design theory*, for example, suggest that structural aspects of organisations are related to the environmental context of organisations (March, 1976; Nystrom and Starbuck, 1981; Scott and Davis, 2007). There is no universal best way of organising, instead successful organisation is contingent on, and should be in compliance with, the external environment (Lawrence and Lorsch, 1967; Hofer, 1975; Pennings, 1992). In keeping with this view, changes in contingent environmental factors such as competition, resources and technology call for organisational changes and adjustments. It has been suggested that in rapidly changing environments some organisations elaborate designs allowing them to be more adaptive to changes in external factors (Burns and Stalker, 1961).

Building on prior theoretical contributions such as the *behavioural theory of the firm* (March and Simon, 1958; Cyert and March, 1963) and *Schumpeterian economics* (Schumpeter, 1934), **evolutionary economics** has a strong focus on the environmental context of organisations. Here, competition constitutes the major mechanism that selects some firms and deselects other firms (Nelson and Winter, 1982), and the competition context shapes organisational forms and changes in these forms. This competitive pressure on organisations is arguably reinforced in a globalising and technologically developing economic setting, and more recently evolutionary economics has been an important building block in the *literature on dynamic capabilities*. Central in this literature is that organisations must develop dynamic capabilities to create, extend and modify the ways in which they operate if they are to survive and prosper in a dynamic and competitive context (Helfat et al., 2007). In fact, there is a interaction between organisations and their environment. Organisations are not only shaped by their environment, they also affect the socioeconomic environment, especially when they move at the competitive edge on the basis of practices of continuous learning and adaptation (Armbruster et al., 2006).

The competitive context is, however, merely one dimension of the external environment surrounding and shaping organisations. **Institutional approaches** show that other di-

mensions of the institutional context of organisations are also important for organisations and organisational change. First, competition and economic development are not abstract phenomena constituting an abstract, universal context of organisations. It has been stated that *social systems of production* (Hollingworth and Boyer, 1997; Gjerding, 2008) and *varieties of capitalism* (Hall and Soskice, 2001) can explain national differences in social and economic structures, performances and policies. This is related to the fact that competitive forces are embedded in different types of welfare states, including social welfare systems; national educational and learning systems; systems of labour and industrial relations; and national governments imposing rules on the economic systems and on businesses. With a focus on innovation and economic development, Lundvall (1992), Nelson (1993) and others have argued that we have *national innovation systems* in which institutional setups are critically important for innovation and economic development among firms and other organisations.

The fact that competitive forces are embedded in welfare states and affected by political systems raises another important issue related to organisations and organisational changes. A large fraction of today's organisations are **public organisations** serving public goals. Further, the grey zone between public and private sector organisations has increased. Especially, public organisations are situated in a context where political decision-making is a major source of transformation pressure for the adoption of desired types of management practices, ICT and work systems, strategies and performance criteria. An important paradigm behind reforms in the public sector since the 1980s has been what Christopher Hood (1991) baptised, *New Public Management (NPM)*. Another perspective on public organisations has concentrated on *Human Service Organisations (HSO)* (Hasenfeld, 1983; Sarri and Hasenfeld, 1978). Such organisations are mandated to protect and promote the welfare of people and they work directly with the people they are intended to protect, maintain or enhance. To some extent the two viewpoints on public sector organisations counterbalance each other. Whereas NPM gives priority to market orientation and efficiency based schemes (Hood, 1991, 2004), HSO underlines the moral foundations of public sector organisations' work and their social welfare implications. NPM and HSO exhaust in no way the strategies of public management but the two perspectives highlight important choices which have to be made. The adoption of e-government is also central to the modernisation agenda in the public sector. Other choices concern the active involvement of civil society and network relationships but they are not developed here.

To sum up, the organisational context and socioeconomic drivers of change are arguably important for studying and measuring organisations and organisational change. The theoretical perspectives dealt with in this section call for investigating how competitive pressures on organisations affect their structure and change, as well as for how other institutional dimensions and political decision-making affect organisations. Finally, it has been pointed out that organisations differ, and that public sector organisations in some respects should be studied on their own merits.

III.2 Management practices and techniques

Confronted with external pressures, organisations may take a more or less active stance in accordance with their policies. The **policies** of an organisation are defined as main lines of the strategy adopted by the management to fulfil the identified needs and goals of the organisation. Research results point to the importance of flexible and adaptable management strategies defining new external possibilities and the development of a corresponding internal organisational structure securing communication and learning processes backed by employee commitment and the development of employee competences and resources. This does not mean that there is only one successful way of managing organisations, but it does mean that given internal and external circumstances, some ways of organising produce better results. The best strategy at times may be to secure a steady state, whereas under other circumstances structural change is necessary. In what follows we discuss some of the more important practices and techniques currently used by management to further their strategic goals.

Management practices and techniques can be understood as models used by managers to organise activities and to rationalise their decision-making. Research on techniques and practices has deepened our understanding of their impact on enterprise performance and employee outcomes. Here, we focus on those practices and techniques that form part of strategies for greater organisational flexibility and innovativeness and which are relevant for understanding the direction of organisational change: Total Quality Management, Lean Production, ICTs and Knowledge Management.

Total Quality Management (TQM) covers a broad field of management practices. Important aspects include underlying values of the nature of quality and limits to quality, focus upon the nature of customer – supplier relationships and structures, and processes securing the chosen quality level. A TQM strategy is expected to revise, improve and optimise each of the internal procedures and processes of an enterprise. Quality is assumed to arise from optimal process design. There is emphasis on the importance of everyone in the organisation being involved, as every step or job process is seen as an opportunity to eliminate error or waste, and to improve the output of the organisation (Morgan and Murgatroyd, 1994). Thus, the management concept of continuous improvement processes (CIP) is often seen as an essential part of the implementation of a quality management system (ISO certification). The aim of CIP as a management concept is to improve the quality of both the products and the technical and organisational processes of an organisation in small continuous steps. It is understood as an organisation-wide, on-going learning process of focused and sustained incremental innovation (Bessant and Caffyn 1997, Bessant et al. 2001).

Closely linked to those dimensions of TQM focusing on eliminating errors and waste are systems of **lean production** which have made their headway in many countries since the 1990s. The aim has been improved performance measured by profits and/or new product development. Lean production may be defined as applying a number of principles or seen as taking a series of practical steps. Drawing upon Womack and Jones, who initiated the 'lean wave', the lean principles can be condensed to "precisely specifying value by specific product, identify the value stream for each product, make

value flow without interruptions, let the customer pull value from the producer, and pursue perfection” (Womack and Jones 2003, p. 10). The practical use of lean strategies includes issues of cost reductions, employee empowerment, value chain orientation, customer focus and product innovation.

The introduction of modern **Information and Communication Technologies (ICT)** is an important choice for both private and public sector organisations as underlined by the Kok report (2004). ICTs are tools (equipment and software) that are used to produce, process, transmit and store information. The use of ICT implies the gathering and storing of data and the diffusion of information and knowledge of importance for production and services as well as innovation and learning. An important strand of literature focuses on complementarities between ICT and management practices (Bresnahan *et al.*, 2002; Caroli and Van Reenen, 2001; and Greenan and Walkowiak, 2005). This literature emphasises that the effective use of ICT depends on appropriate forms of training and on forms of work organisation which make use of ICT’s potential for diffusion and storing information and knowledge. Bresnahan *et al.* (2002), for example, find that ICT use is complementary to a new workplace organisation which includes broader job responsibilities for line workers, more decentralised decision-making and more self-managing teams.

Knowledge Management (KM) tackles the integrative problems of data accumulation, diffusion, and implementation. A fundamental problem in knowledge management is to transfer and transform knowledge from one form to another one (e.g. from tacit skills to codified information) and between different levels, notably from the individual level to the collective level. As with HRM, it is possible to identify ‘hard’ and ‘soft’ approaches to KM. The hard approaches emphasise the use of formal systems often involving use of ICT to centralise and manage the use of codified knowledge. In the softer approaches the emphasis is more on the social processes whereby new practices based on largely tacit knowledge emerge and are accepted by the actors. The focus here is on learning processes at the individual and group levels and how these dynamics are linked to the internal enterprise governance mechanisms regulating training, careers and compensation.

Many of the management practices discussed above are elements for achieving greater **organisational flexibility**. Organisational flexibility may take various forms and a number of studies emphasise the distinction between functional and numerical flexibility. *Functional flexibility* is designed to increase the possibilities to redeploy employees between activities and tasks by empowering workers with greater decision-making responsibility and assigning them a greater scope of different activities. This form of flexibility is generally associated with team work, autonomous work teams and flatter hierarchies (Chadwick and Cappelli, 2002). Organisations aiming at achieving a high degree of functional flexibility, however, need to offer incentives to the employees to mobilise their tacit knowledge. Thus, functionally flexible firms often employ financial incentives based on group performance (Macduffie, 1995). A number of empirical studies have found that functionally flexible firms are both more productive (Black and Lynch, 2004; Zwick, 2004) and more innovative (Hujer and Radic, 2003). *Numerical flexibility* concerns quantitative regulation of labour by means of 1) hiring and firing and use of instruments such

as temporary contracts (external numerical flexibility) 2) regulating working hours among the workforce (internal numerical flexibility). Numerical flexibility aims at a reduction of fixed costs, for example by contracting out jobs (Gramm and Schnell, 2001).

A strategic use of combinations of flexibility measures gives the possibility of continuous organisational adjustment in relation to changes in the environment. Especially the use of functional flexibility may be expected to enhance learning and firm specific competencies among the involved employees.

To sum up, the treatment of firm management practices and techniques has pointed to the importance of a flexible management strategy as part of its policy. Common features of these practices have been an increasing importance of knowledge, learning and innovation mirrored by flatter hierarchies and intensified communication and task coordination. Such changes have been founded on management initiatives towards greater employee involvement through delegation of responsibility. While such practices are an important feature of contemporary organisational change, it is important to take into account the continued use of more traditional or bureaucratic organisational forms based on high levels of standardisation of tasks and skills. The Guidelines will provide the basis for capturing the existing diversity of organisational types.

III.3 Organisational structure and work organisation

Management policies and practices determine a number of organisational elements given certain internal and external constraints. It is management’s role to design and redesign these. From a theoretical point of view the elements which define an organisation differ between schools of thought, including the extent to which they are treated as objective as opposed to subjective. In keeping with the goal of providing a policy relevant measurement framework, the MEADOW Guidelines define the organisation’s design in terms of those elements of the *organisational structure and work organisation which can be objectively measured and are subject to management planning*.

Organisational structure refers to the groupings of people, tasks and objects into sub-units and business functions, and the systems to ensure coordination and control both horizontally and vertically within boundaries of the organisation and outside these boundaries, in relation to suppliers, customers and other business partners. Organisational studies have defined a number of different organisational structures based *inter alia* on different coordinating mechanisms, design parameters and activity flows. The internal structure can be characterised by the extent of horizontal and vertical differentiation. The horizontal dimension expresses the division of labour, whereas the vertical one shows the authority relationships between managers and employees. Together they define the extent of organisational complexity. Both along the horizontal and vertical lines will be found various coordination mechanisms and control. The division of labour, coordination mechanisms, authority relationships and control are central to how management governs and changes the organisation and how the employees experience their working conditions and possibilities for personal development.

With respect to public organisations more information is required on the effects of public policies stressing more market orientation, competition between public and private organisations and decentralisation in the perspective of *New Public Management* (NPM). Similarly, it is necessary to monitor value issues and human relationships as presented by the *Human Service Organisations* (HSO) perspective. In the following, major types of modern management are highlighted with the aim of crystallising important structures and the related processes and human factors of value for future studies.

Closely linked to the organisational structure is the *organisation of work*. The concept of work organisation refers to how work is actually divided into tasks, the bundling of tasks into jobs and assignments and the skills required, the interdependencies between workers in performing the job, the job demands, the degree of control over the work done and the support possibilities. Complementary to these work arrangements are elements defining a system of employment relations which identify the kind of membership to the organisation that employers offer to employees. This system is comprised of such elements as recruitment, contractual arrangements, training and competence development, career and mobility (Nielsen 2006 p.9). As treated by industrial sociology, labour studies and related disciplines within psychology and economics, the work system and employment relations must be seen as the result of management's decisions and employees' participation in the decision making within the constraints of national and international regulations regarding working conditions and employee representation. The previously mentioned drivers of organisational change set more or less clear imprints upon the organisation of work and the complementary employment relations and their economic and social impacts. The MEADOW Guidelines give priority to the measurement of work organisation but such employment relation issues as competence development, training, employee participation, motivation and rewards are also treated in close connection with work organisational arrangements. Wider industrial relations issues such as agreements on wages and the extent of industrial conflict are not addressed.

III.4 Organisational design and redesign

The literature describes various ways in which the key features of organisational structure and work organisation can be combined leading to different types of organisational designs and related outcomes. The history of the change from bureaucratic and/or authoritarian types to more organic and human oriented organisations has often been told, but the more exact content of the changes and their implications still present puzzles that demand further investigation. An example could be the 'adhocracy' (Mintzberg 1979). This type is characterised by specialists deployed in project teams, much training, little formalisation and coordination by mutual adjustment. While this design is seen as a strong form in a complex and dynamic environment, it has the drawback of low internal efficiency because of high costs of communication.

An important strand of research dealing with the transition to more flexible organisational designs is the *High Performance Work Systems* (HPWS) literature. In HPWS, management focuses upon extensive employee involvement in operational decision making as a means to harness the potential of people and improve the performance of the orga-

nisation. Employees in a HPWS are expected to experience greater autonomy over their job tasks and methods of work and have more control over communication about work matters with other employees, functional specialists, managers, and in some instances with suppliers and/or customers. In addition, human resource practices are also important (Appelbaum et al., 2000). Employees in a HPWS require more skills to do their job successfully and many of these are firm-specific. In sum, effective HPWS require three basic components: opportunity for substantive participation in decisions, appropriate incentives and training, and selection policies that guarantee an appropriately skilled workforce.

In *Socio-technical systems design* (STSD) attention shifts from working groups to the organisation as a whole (De Sitter 1982). STSD formulates a set of design rules for a structure of the division of labour that has a positive effect on the performance of the organisation as well as on the quality of working life. In modern STSD, coping with the complexity of the organisation occupies an important position. A central design principle that builds upon system theory (Ashby 1969) holds that organisations must create a number of variation options equal to those present in their environment. The more complex the environment, the more complex must be the organisation.

Evolutionary and resource-based perspectives focus on the relation between the organisation's design and its *dynamic capabilities* defined as learning abilities and integrative abilities which are cardinal to adaptation and innovation. In a broader sense, "dynamic capabilities relate to the enterprise's ability to sense, seize, and adapt, in order to generate and exploit internal and external *enterprise specific competences* and to address the enterprise's *changing environment*" (Augier and Teece, 2008 p. 1190).

The notion of dynamic capabilities brings processes of information exchange, knowledge development, and mutual learning to the fore. These processes are central to the notion of *Learning Organisations*. While organisational learning theory focuses on the informal situated and collective learning processes based on experience in so called 'communities of practice' (Lave and Wenger 1991), the theory of learning organisations identifies structural and cultural traits promoting learning and establishing relations between individual, group and organisational levels (Elkjær B. 2000). Both theories include some general traits, possible to capture through survey instruments, which have in common that they speed up both adaptation and innovation. The first trait is a limited number of levels in the vertical hierarchy. The second is vertical and horizontal communication supported by interdivisional teams and/or by job rotation across division borders. The third related trait is the delegation of responsibility and situated learning. A fourth trait relates to external interaction and a network positioning balancing bonding (long term relationships) and bridging (repositioning and fluid relationships).

The development of dynamic capabilities may depend on introducing changes in the existing organisation or on organisational redesign. Changes in structures and processes may be referred to as *organisational innovations* in so far as they are used for the first time by the organisation and express significant changes. Obstacles to both innovative and non-innovative changes are found in the actors' attitudes and behaviour, in the lack of human resources, or financial resources and in time pressure. In an organisational

context, individuals may display inertial behaviour because organisational changes tend to disrupt the “organisational truce” (Nelson and Winter 1982) on the one hand, and reduce the discretionary power they hold within the organisation, on the other. Another barrier is difficulties of learning new work methods and ‘unlearning’ old ones (Lazarc 2007). Here, the presence of *learning capabilities* would express skills and proficiencies that enable people to consistently enhance their capacity to produce re-sults (Senge et al. 1999)

III.5 Employment relations

A vast literature shows that both economic and social performance are affected not only by the organisational design but also by the system of employment relations which identify the kind of membership to the organisation that employers offer to employees, including elements such as recruitment, contractual arrangements, training and competence development, and career and mobility. Employment relations are highly complementary to the organisation of work and they have an impact on job quality and hence on work-related stress and job satisfaction. Payment systems and careers impact on employee morale and motivation and one of the insights of the work on HRM complementarities is that incentive systems need to be designed to be complementary to the physical and cognitive demands of the system of work organisation.

1) Human Resource Management

Human Resource Management (HRM) is a concept that treats the human factor as the most important element in creating competitiveness, efficiency and quality. HRM has been developed for more than fifty years, drawing on psychological, social psychological and organisational theories concerned with the relationship between the individual and the organisation. Important dimensions of HRM comprise employee commitment, development of human resources and restructuring and job redesign to allow devolved responsibility and empowerment. It is part of the theory that management has to involve itself and that there is a need to ‘manage the managers’. From the start both ‘hard’ and ‘soft’ models have been developed. The ‘hard’ models emphasise the strategic and rational approach to managing resources, while the ‘soft’ models emphasise the development of humans, based on consensus and commitment (Storey 1992). A recent strand of literature has focused on identifying the positive performance effects involved in combining specific HRM practices with managerial practices designed to enhance employee discretion and more fully involve employees in problem-solving activities. In the organisational behaviour literature, this issue is conceptualised as one of **HRM complementarities** (Ichniowski, Shaw and Prensushi, 1997; Laursen and Mahnke, 2001; Lorenz et al. 2004; Michie and Sheehan, 1999).

2) Motivation and reward systems

Work is an important factor in individuals’ self identification and desire for social relationships (Graversen 1992). Therefore, it is not difficult to understand that motivation to

work is built upon these elements. Yet, in recent years more focus has been directed towards the important balance between work and family life, including the negative side of unemployment.

Monetary rewards or compensation systems are an important part of motivation theories. From an employee perspective it is important to secure internal equity in pay. Furthermore, achieving an equitable outcome will depend on mutual understanding between employer and employee regardless of whether pay scales are set through job analysis, job evaluation schemes, or employee appraisal. The various types of reward systems and forms of pay forms are based in individual or group level pay and a mix of fixed and performance pay. Most often, the reward and pay system will have three elements: a fixed base pay, performance pay and non cash benefits. At the same time, it is important to note that the introduction of such systems within firms is often dependent of collective agreements and it is important to arrive to a better understanding of how organisational change impacts on the bargaining process.

3) Skill requirements, skill utilisation and training

The extension of new management practices and the role of employee participation point to a number of skill which are seen as necessary for these developments. They comprise various social skills combined with technical ones. Examples comprise taking responsibility, being involved and becoming multi-skilled. The necessary acquisition and upgrading of such skills are based on both formal training supplied by external agencies and on-the-job learning. The specific advantages and disadvantages of different ways of learning under given circumstances are in need of more research.

Contrary to this development, downgrading of skills requirements can be seen as emanating from the fragmentation of jobs. Such a development should not be seen as a purely technical necessity but is closely connected to the choice of work structuring and division of labour. Firm flexibility and labour market developments may require that employees work in another field than the one corresponding to their original education and vocational training.

The difference between skills and competence also needs to be stressed. The latter has been defined as an “underlying characteristic of an individual which is causally related to effective or superior performance in a job” (Mansfield, 2004). Competence building has a broader perspective than skill development and is a central element in Human Resources Management’s approaches.

4) Job security and employment status

The contractual arrangements offered to employees can vary between full-time and part-time work, and between permanent contracts and temporary contracts. The contracts may contain more or less strict dismissal rules. In connection with organisational change, it is important to gain a better understanding of the social and economic effects of these different employment statuses and corresponding job security or insecurity. Recent research has suggested that flexible non-standard employment may have adverse

effects on the health of workers (Benach 2004). Nevertheless the empirical evidence linking non-standard work and health is extremely limited and the results are mixed.

To sum up, the treatment of work organisation and employment relations has pointed to the importance of changes in work tasks, job demands, skills requirements, and systems of pay and motivation. But it has also been emphasised that much remains to be done to get a clearer picture of the content and implications of change. The Guidelines propose a series of indicators that can be used to capture the existing diversity in employment relations across firms and nations and how it is connected to changes in organisational structure and work organisation.

III.6 Organisational performance: economic and social

The strategies and policies of the organisation, the management practices implemented, the structure of work organisation and the way in which an organisation adapts to its environment are all perceived to affect organisational performance. In this section we classify writings and perspectives on organisational performance into two broad categories: (1) economic performance and (2) social performance, each category containing different subcategories.

Economic performance is closely related to the competitive performance of private business firms measured in terms of productivity, financial performance, firm survival and innovation performance. These generally accepted measures are developed in a range of literatures concerned with the economic performance of organisations, for example in the aforementioned literature on Human Resource Management where bundles of new HRM practices have been found to positively affect productivity and financial performance (Huselid, 1995; Huselid, Jackson, and Schuler, 1997; Macduffie, 1995). Firm survival as a performance criterion is developed in evolutionary economics (Nelson and Winter, 1982), and given today's dynamic economic setting, innovation and innovative performance have received increased attention in the literature (Fagerberg, Mowery, and Nelson, 2005). With respect to innovation as an outcome and as a measure of economic performance, Arundel et al. (2007) find a link between the organisation of work and innovation performance.

Transformation pressures and reforms related to the New Public Management are meant to increase economic performance orientation and promote efficiency based schemes in the public sector (see e.g. Hood, 1991, 2004). Performance measurements focussing on the efficient use of resources and personnel in public sector organisations may be compared with private sector performance measures. However, public sector organisations also have to include issues of legitimacy and human welfare as major performance criteria. From this perspective the performance of the Human Service Organisation is judged in terms of the ability of organisations to work directly with the citizens they are mandated to protect, maintain or enhance.

Social performance is defined as good employment and working conditions, including decent wages, safety at work, potentials for competence development and work-life balance. Issues of social performance are dealt with in the literature on the

introduction of new management practices. For example, if work intensifies in the context of the introduction of new management practices (Burchell, Lapido, and Wilkinson, 2002; Green, 2001), then it may influence employee stress, psychological health and family tension negatively, especially if the work intensification is not handled appropriately (Green, 2004). This is in accordance with the Job Demand and Control (JD-C) model (Karasek, 1979; Karasek and Theorell, 1990), focusing on problems of job stress. The JD-C model is based on two dimensions: job demands and job control, or decision latitude. The expectation is that neither high demands nor low control causes job stress. It is rather the combination of high demands and low control that is detrimental to health. Healthy work is defined by situations where workers have opportunities to use their skills and to control their activities in order to balance the demands of the job. In such situations, employees have opportunities to learn and they are motivated to develop coping strategies resulting in new behavioural patterns.

From another perspective stress is bound to the breach of a norm of distributive justice. This idea is mirrored by the *model of effort – reward imbalance* (ERI). Recurrent violation of the norm of reciprocity may elicit a sense of being treated unfairly and suffering injustice which afflicts the workers' self-esteem. Conversely, adequate approval and esteem, whether experienced in terms of money or recognition, job promotion or job stability, enhances self-esteem and satisfaction.

How organisational change affects job demand, job control, efforts and rewards might be contingent both upon the starting point and the direction of change. Stress levels may be high for workers that have been engaged in standardised work for many years and suddenly have to learn to make more decisions by themselves. Other factors that mediate the effect of organisational change upon stress are employment and unemployment security. Stress is to be expected if the risk of losing one's job is high and if the individual carries most of the economic risks of becoming unemployed. For instance, recent organisational changes have exposed middle managers to high risks of job loss and this may contribute to their stress level.

Parts of the organisational literature dealing with social performance focus upon the **gender dimension**. Kanter (1977) and Acker (1999) are two contributions arguing that structures and processes in organisations are important for gender biases and divisions like those related to division of work, wages and hierarchies. According to Kanter, structures and processes in organisations are important for understanding women's and men's behaviour, as different structures shape men's and women's actions and possibilities in organisations. According to Acker, organisations should be regarded as processes and practices. Changes in work processes and practices often follow from organisational change and this means that members of organisations undergoing change are also 'doing gender'. Organisational change may alter power relations between women and men but empirical studies indicate that the traditional gender order is very resistant to change (Abrahamsson 2000, Bergman 2004). However, in some countries women have on average a higher level of education than men, and organisations in their policies to increase gender equality may change the division of work tasks and employ more women in higher positions (Härenstam et al. 2004).

To sum up, the structure of organisations and organisational change result in differences in economic and social performances. Economic performance can be measured in terms of productivity, financial performance and firm survival, whereas social performance is related to good employment and working conditions. Depending on how organisational goals are specified, both performance categories can be seen as important and, thus, call for further investigation and collection of empirical data.

IV. Areas for investigation and the relevance of linked data

The MEADOW Guidelines are based on the premise that policy initiatives related to economic efficiency, growth and social goals will benefit from reliable survey data on organisations and organisational change. Ideally, a comprehensive information system should provide data on all factors relevant to organisation research, analysis and policy. In practice, surveys will only provide us with some relevant data, and these data will then be complementary to other sources of qualitative and quantitative information collected on organisations and organisational change.

IV.1 What can be measured?

Organisational surveys can provide a wide range of information on organisations and organisational change. Surveys can provide relevant measures of the structure of organisations including information on the way decision-making is coordinated between different levels of the hierarchy and across different services and divisions. Surveys can also provide measures of inter-firm relations and the nature of the dependencies that may exist between an organisation and external suppliers or partners. Surveys are also able to provide a breadth of information on management policies and techniques in the areas of human resources management, work organisation, working time and the quality of work. As discussed in further detail in Chapter II of the Guidelines, change in these elements can be captured both through the use of retrospective questions in cross-section surveys and through the use of panel surveys.

There are clear limitations to what can be reliably measured with surveys. Much of the literature on organisational change and innovation makes a distinction between planned changes with identifiable and significant impacts on the organisation and smaller more incremental changes. The informal nature of these incremental changes and the fact that they often go unrecognised by management or even by the actors directly involved means that such changes are difficult to measure. This difficulty is reflected in the emphasis on theories which assume that organisations can be planned and managed to achieve goals and objectives. The Guidelines define organisational changes in terms of intended changes in the organisational design which is understood as being composed of the organisational structure and the organisation of work.

While organisational surveys can provide some information on the context or drivers of change, this information will necessarily be limited to the perceptions of respondents concerning how these economic or institutional factors are experienced. Other complementary methods can then be used to assess the impact of macro-level variables or

institutional framework conditions on the organisation. The progressive harmonisation at the European level of macro-level indicators of the economic context and of policies affecting labour markets and educational systems makes multi-level analysis an attractive approach to investigating these effects.

Surveys can provide relevant information on the performance of organisations including both economic and social performance. As discussed in greater detail in Chapter III, surveys face a number of challenges in measuring performance. These are related to the different claims of stakeholders of the organisation, time lags between 'stimulus' and 'reaction', and difficulties in identifying distinct cause and effect relations between organisational change and performance outcomes. Surveys can be designed to provide both objective and subjective measures of economic performance. These tend to capture different and complementary types information about economic performance and are more or less suited to different types of interviewing methods. Requests for quantitative data on performance such as turnover, profits or value added tend to generate high non-response rates in the case of telephone interviewing. In some nations it will be possible to link survey data with register data on enterprise performance and linking in this way can supplement the information provided through subjective questions. Official registers and administrative files can also be used in some nations to provide information on enterprise or establishment demographics and on workforce composition.

IV.2 The research and policy relevance of linked data on the dynamics of organisations and work

Both employer-level and employee-level surveys can provide at least some relevant information on most of the organisational elements discussed above. However, there are obvious differences in what can be best captured through surveys carried out at the different levels. For this reason the Guidelines consider a survey that links the interview of an employer with the interviews of his or her employees as the richest survey setting for measuring organisational change and its social and economic impacts.

1) Research relevance

First, a linked survey can enrich information derived from one level with information from the other. For example, employer-level information provides useful contextualisation to the description of work provided by employees, whilst employee-level information can be used to compute indicators at the employer-level on topics that cannot be easily observed by an employer, such as the nature of intrinsic rewards or work-related stress. Developing a linked survey also allows to choose the most informed and relevant respondent for each topic of the survey. For example, an employer will be better informed about the organisation's strategy while an employee can more easily describe his or her job characteristics, such as whether colleagues can provide assistance in carrying out a job. Developing both an employer-level and an employee-level set of measures can therefore bring about an improvement in the measurement strategy for each level, which can also feed-back into conceptual considerations.

Second, a richer set of information allows one to go further in opening the “black box” of the organisation. Box 1 gives examples of questions that can be analysed with a linked survey. In such a survey setting, fewer characteristics remain unobserved and one can obtain a better overall understanding of a phenomenon. This might lead to better estimates, for example, of what human resource practices affect an employee outcome or of the productivity effects of such practices (Hamermesh, 2008).

Third, linked data can provide new sets of instruments to identify endogenous mechanisms, which are not unusual when analysing companies’ strategic decisions about work organisation. When there is a longitudinal dimension to the data, it is possible to approach the way employers and employees are selected as well as antecedents to practice adoption by employers, allowing for a more rigorous analysis of causal processes.

Box 1: Examples of questions that can be analysed with a linked survey

How do work organisational practices and HR policy influence job characteristics and the performance of employees?
 Does innovation at the organisational level have an impact on employees’ well-being?
 How are organisational changes communicated and made visible to employees?
 How do employees react to and cope with different types of changes?
 What is the effect of trade unions on employee awareness of changes?
 What is the indirect effect of trade unions on employer and employee change-related outcomes ?

In general, more rigorous studies can be conducted when the diversity of contexts or circumstances in which employers and employees are involved is taken into account. Current theories suggest that returns to particular practices may be heterogeneous along with such dimensions as product market competition or level of trust between employers and employees. It is thus important to assess to what extent good practices identified in one context may be generalised to other contexts. (Bryson and Forth, 2006).

2) Policy relevance

The Introduction of the MEADOW Guidelines stressed the importance of harmonised data on organisations and organisational change for both economic and social policy. Especially in the European policy context, with the emphasis on combining increased flexibility of enterprises with better quality jobs, there are strong arguments for developing the infrastructure to provide harmonised data on organisational change and its impacts. The MEADOW Guidelines propose a linked employer/employee survey at the richest survey setting for collecting this data and this relates in part to the development of relevant policy indicators and insight.

First, a linked survey could provide useful indicators for policy making that cannot be constructed with single-level survey instruments. For example, adding an employee questionnaire to the Community Innovation Survey (CIS, Eurostat) would allow scoring

the share of employees with innovative behaviour or specific further training and computing this score in the population of innovative employers and non innovative employers across European countries. The European Working Conditions Survey (EWCS, EFILWC) can be taken as another example. It is an employee level survey which is used to assess job quality across Europe through key working condition indicators (EFILWC, 2007). However, the employer is only characterised through its size and sector as it is declared by employees. And if the employee gives his views on how his own work is organised, the management policy and the practices implemented at the employer level remain the hidden face of the coin. Adding an employer questionnaire to the EWCS would allow scoring for example the share of employers with High Performance Work Organisations (HPWO) and then computing working conditions indicators in the population of employers with and without HPWO across European countries.

Linked surveys are also policy relevant because they can provide analytical insights that set hard facts into context. For example, they may contribute to evaluating the policies and management practices of private and public employers. The first linked datasets that have become available for researchers are longitudinal and derive from administrative linked registers tracking employers and employees over time and linking workplace fortune (productivity, employment growth, survival) to worker flows and worker progression in terms of tenure and wages (Bryson and Forth, 2006). Many results have been obtained from these datasets, showing that employers’ activities have a strong influence on wages and other labour outcomes and thus implying that most policy issues on the labour market have an employer angle (Groschen, 1991; Abowd, Kramarz and Margolis, 1999). Linked surveys on organisational practices allow going beyond the analysis of wage and employment practices to tackle other important area of employers’ behaviour.

Linked surveys could also be used in monitoring the impact of labour market or industrial government intervention. An example is active ageing which is moving up the policy agenda. The maintenance of work ability among ageing workers and their efficient utilisation by employers is becoming crucial to increase participation rates of older workers. Analysis based on linked surveys of organisations could contribute to identifying the flexible working arrangements, the type of further training or the job design characteristics that are best suited to maintain older workers in employment. The effect of employer incentives to keep older workers in employment could also be assessed on the basis of temporal and spatial variations in policies across European countries. More generally, a linked survey on the dynamics of organisations and work should aim at reflecting on the design of policies to help employers and employees succeed in an increasingly global economy.

This chapter has started from a very basic measurement framework to capture the core dimensions of the dynamics of organisations and work. Areas for investigations that are relevant both from research and policy perspectives have been identified. These areas can be covered from an employer or an employee perspective instrumented respectively by an organisational level survey or an employee level survey. In the following chapter the elements of a general survey framework for measuring the dynamics of organisation and work are presented including an assessment of linking methods and options for collecting longitudinal information in order to measure change.

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Chapter II

From existing surveys to a general survey framework

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I. Introduction

The aim of this chapter is to propose and justify a general survey framework for measuring the dynamics of organisations and work. The framework is based on the experiences accumulated at an international level over the past twenty years. The Meadow project has produced an overview of these experiences in the Grid Report¹ - a background document to this chapter. Surveys on changes in work and organisations can be of three types: employer-level surveys, employee-level surveys or linked employer-employee surveys. The Grid report has focused on employer and linked employer-employee surveys. Among other sources, an overview study by Weiler (2007), published by the European Foundation for the Improvement of Living and Working Conditions (EFILWC), complements the Grid report through its coverage of employee-level surveys.

In order to achieve the objectives of this chapter, twenty four surveys have been selected for examination on the basis of two main criteria : (1) they allow organisational change to be measured in at least one of its dimensions; and/or (2) they are methodologically innovative. In particular, we have extensively selected linked employer-employee surveys because of their novelty and rich measurement potential. Although each of the selected surveys tackles organisational issues, the topics they cover are diverse, comprising innovation, employment relationships, industrial relations and collective bargaining, wage structures, production management and working conditions. They are carried out variously in national or international contexts. They embed a wide range of methodological designs, among which we identify four major approaches: employer only; employee only; linked employer/employee where the employer is sampled first; and linked employee/employer where the employee is sampled first. Another important methodological choice is between a cross section survey, measuring change by retrospective questions, and a panel survey, measuring change through repeated measurements. Table 1 classifies the selected surveys according to these main methodological characteristics.

Table 1: A set of possible survey designs

	Time dimension	Example of existing survey
Employer only	Cross section	<u>CIS</u> , <u>ECS</u> , <u>ESWT</u> , <u>EMS</u>
	Panel option	DISKO, OSA Er, NUTEK, PASO
Employee only	Cross section	<u>EWCS</u> , <u>ESS</u> , <u>BSS</u>
	Panel option	NWCS, OSA Ee
Linked employer/employee (or employer first approach)	Cross section	COI, <u>ESES</u> , MOA, TNO/WIS
	Panel option	LIAB, REPOSE, WES, WERS,
Linked employee/employer (or employee first approach)	Cross section	AES-CVTS, EFE, NOS,
	Panel option	

Note: underlined surveys are cross-national, NOS and WES are national (North America), PASO is regional national (Flemish region) and the other surveys are national (European countries). The full name of each survey and the names of its producers and sponsors are in the annex to this chapter.

¹ Meadow Background document N°2, available at <http://www.meadow-project.eu/index.php?/Article-du-site/Background-documents.html>.

Taking into account the policy need to build a better understanding of the flexibility of enterprises and its consequences in terms of performance and job quality, as well as the theoretical perspectives drawn out in chapter I, this chapter will draw upon the methodological experiences derived from the selected surveys in order to propose a general survey framework. The surveys offer a base from which it is possible to assess the advantages and drawbacks of different types of survey design in terms of data quality and in terms of research goals. The surveys also illustrate methodological issues on which the Guidelines make recommendations. As a result, the MEADOW Guidelines have a solid foundation built on national and international experiences.

European harmonisation in the design of the proposed survey is a clear priority of the MEADOW project. The Guidelines recommend a survey which can be administered in different national contexts within Europe in a way that nonetheless allows international comparability. This brings some challenges, because most of the surveys listed in Table 1 have been conducted solely at the national level, while only a few have addressed the challenging methodological issue of establishing relevant, valid and reliable international comparisons.

Currently, one major difficulty which has to be faced is the lack of a unified employer database at the European level which would allow one to draw a representative sample of employer units in a straightforward manner. Thus, we have had to investigate alternative methods which are conditional upon the existence of statistical infrastructure at the national or European level, such as official registers of employers. Special attention should therefore be given to the limited number of surveys which cover more than one country. Among the twenty-four surveys we have reviewed, seven are international. However, while eleven of the national surveys are linked employer-employee surveys, only one international survey is linked and this is the case only for some of the participating countries. This constitutes a major challenge for the MEADOW project which has, from the beginning, acknowledged the complementarity of employer and employee-level surveys in measuring changes in organisations and work.

When seeking to implement the survey in practice, two different approaches can be followed: a centrally-coordinated approach or a decentralised approach. In a centrally-coordinated approach, one organisation is in charge of developing and translating a questionnaire and of prescribing the survey methodology. The European Working Conditions Survey (EWCS) and the European Social Survey (ESS) are centrally coordinated. In the first case, an international organisation coordinates the implementation of the survey (EFILWC); in the second case, a central coordinating consortium of institutions is responsible for the design and coordination of the survey under the lead of the Centre for Comparative Social Surveys in City University (UK). In both cases, the fieldwork is carried out by a network of contractors. The Community Innovation Survey (CIS) and the European Structure of Earnings Survey (ESES) have been carried out in a decentralised mode. These surveys are covered by European regulations which require each Member State to participate. Eurostat is responsible for coordination and quality issues and, in close cooperation with EU Member States, develops a standard core questionnaire in English and an accompanying set of definitions and methodological recommendations.

The responsibility for the survey at the national level lies in most cases with the national statistical office. Pilot surveys are also often carried out in a decentralised approach, with a number of statistical organisations or offices volunteering to implement a survey instrument following a set of guidelines. The means by which comparability is built into the development of the survey partly depends on the strategy for survey implementation. In particular, a centrally coordinated survey ought to lead to a fully harmonised survey. This goal will be more difficult to achieve under a decentralised approach.

However, the following general harmonisation principles can be proposed:

- Key elements of the survey design, such as the method for linking employers and employees, or the choice of panel observation and retrospective questions, must be identical in all countries.
- The sampled units and population covered also need to be identical: all surveys must define the employer units and their employees similarly, making the same exclusions and inclusions.
- The sampling frame used in each country should offer an exhaustive listing of survey units.
- In all countries, sampling procedures should be based on the principle of random selection, although it should also be possible to adjust the achieved samples within each country to account for differential non-response across some key structural variables (for example size of employer unit and industry sector).
- Each country sample should meet some accepted minimum criteria regarding the statistical precision of the estimates.
- One should aim for an identical data collection period across countries.
- The survey can comprise a core of identical and well-translated questions, complemented by a set of more specific national questions and, if such data exist, may be enriched by national administrative data.

Given these principles for international harmonisation, the next sections of the chapter discuss core aspects of survey design: the method of linking employer and employee observations (section II), the method for measuring change (section III) and other key elements of survey design (section IV) including the choice of employer unit to survey, the population coverage of the survey and methods of data collection. The concluding Guidelines from each of these sections set the general survey framework for MEADOW. The practicalities of administering this general framework are discussed thoroughly in chapter V.

II. Linked employer/employee survey versus linked employee/employer survey

A linked employer-employee survey which aims to analyse organisational change, adds complexity to the practical side of data collection. Indeed, a linked survey may increase costs, for it adds a new survey if the employer or the employee survey already exists, and it also requires that the two survey levels are coordinated. The sampling, contact and response procedures are also more complex as there are now two potential sources of non-response bias and the added difficulty of optimising the sampling methods at both levels. Despite this, more information is available to identify and correct for non-response biases. These technical difficulties must be weighed up against the novelty and richness of the information that is gathered and their consequent value to evidence-based policy-making, and by the new field of research in social sciences which such a dataset opens up on the interactions between employers and employees.

Of course, within these Guidelines, one possibility would be to conceive separate employer or employee-level surveys. However, we stress that linking is a practical and interesting solution. In some countries, it will just amount to the coordination of samples for two existing surveys. For example, in France two separate European harmonised surveys on training have been linked recently: the Adult Education Survey (AES) among employees and the Continuous Vocational Training Survey (CVTS) among employers. Linked surveys can also rest on an existing linked employer-employee register, such as the LIAB in Germany, or they can be successfully administered from first principles as in the case of the WERS survey in the UK.

There are two possible methods for administering linked employer and employee level surveys. The employer can be sampled first, while the employee is sampled later in a second stage (linked employer/employee survey). Or, the opposite procedure may be adopted, with the employee sampled and interviewed first, and the interviewed sample of employers being derived from this employee sample (linked employee/employer survey). These two different ways of linking are not equivalent in terms of advantages and drawbacks.

GUIDELINE:

A survey that links the interview of an employer with the interviews of his/her employees is the richest survey setting for measuring the dynamics of organisations and work because of its policy and research relevance.

II.1 Linked employer/employee survey

When linked employer and employee surveys are administered, the most common practice at present is for the employer to be designated as the primary sampling unit. Table 2 gives basic information about six linked employer/employee surveys².

A linked employer/employee survey has many advantages. First, taking the employer as the primary sampling unit (PSU) makes it easier to survey the various employees who are linked to it. A clustered sample is obtained, which is both simpler and cheaper to administer than a simple random sample as fewer contacts are needed overall. Second, in the absence of linked employer/employee registers, the unit which is sampled first will be easier to follow-up in the case of a longitudinal survey. Consequently, if employees are the PSU it will be more difficult to obtain a panel of employer units. Section III will show that a panel design is an interesting solution for measuring organisational change. Third, the representativeness of the sample of employers should be easier to guarantee in a setting where the employer is the PSU. As a matter of fact, in linked employer-employee surveys, the dispersion of sampling rates is always higher within the sample for the second-stage. There are also two sources of non-response bias in the second-stage sample. Both effects result in estimates with a higher variance (Ernst *et al.*, 1989). Moreover, at the employee-level there are already a number of longstanding employee surveys which are harmonised at the European level. Two well-known examples are the Community Labour Force Surveys (LFS) and the EWCS. Background statistics from such surveys would allow one to check the validity of estimates at the employee-level. At the employer-level, the knowledge base around harmonised surveys is not as solid as it is more recent, making the control of the sampling frame more critical. All of these reasons imply that a linked employer/employee survey makes better use of a fixed budget, as has been documented for the Canadian WES survey (Krebs *et al.*, 1999).

Table 2: Linked employer/employee surveys

	Sampling procedure	Net sample size of linked samples and response rate
COI (France) 1997, 2006 http://www.enquetecoi.net	Sample of firms: stratified by size and industry from a business register, 10 or more employees, private sector and exploration in public sector in 2006 Sample of employees: random samples of 2 to 15 employees with at least one year of seniority from a social contribution register.	In 2006: 7,700 private firms, 85% 15,000 employees, 72%

² Some of the surveys have technical documentation from which we have extracted the information in table 2. Greenan and Hamon-Cholet (2001) provide further information on the COI survey; Eurostat, unit F2 (2006) summarises the ESES 2002 quality reports from each participating country; Alda *et al.* (2005) give further details about the LIAB; Chaplin *et al.* (2005) give technical insights into WERS 2004; and Krebs *et al.* (1999) describe the WES.

ESES (European) 1995, 2002, 2006 http://epp.eurostat.ec.europa.eu/ http://cep.lse.ac.uk/leed/	The European Union Structure of Earnings Survey was conducted in 2006 in the 27 Member States of the European Union and Norway. Sample of establishments: stratified by firm size, sector and region, 10 or more employees, in private and public sector in 2006 (sections C-K, M-O of NACE Rev.1.1), coverage of smaller size firms is optional. Sample of employees: the management of establishments collects detailed information on employees and/or a random sample of employees is drawn to collect information in a questionnaire sent at the employee address. The average number of employees per workplace ranges between 9 (Portugal) and 1,000. (Slovakia).	In 2002: largest employee sample: Czech Republic: 2,300 establishments 1 million employees smallest employee sample: Portugal: 6,600 establishments 60,000 employees
LIAB (Germany) since 1993 http://fdz.iab.de/	Sample of establishment: with at least one employee covered by social security, stratified by sector, size and region from a business register, private and public sectors Sample of employees: information from the social security register; there is a lag of two years due to the Social Security System, for example: 2006 employee information is available by 2008). A first employee survey was conducted in 2007.	In 2006: 15,449 establishments, 80% exhaustive register information for employees
REPOSE (France) 1998, 2004 http://www.travail-solidarite.gouv.fr/	Sample of establishments: stratified by size and industry from a business register, private sector, 20 or more employees Sample of employees: random samples of 8 to 12 employees per establishment from a register in 2004 (Third sample of employee representatives)	In 2004: 2,677 establishments, 62% 7,940 employees, 32% (1,970 employee representatives, 88%)

<p>WERS (UK) 2004 http://www.wers2004.info/</p>	<p>Sample of workplaces: stratified by size and industry from a business register, private and public sectors, 5 or more employees in 2004 Sample of employees: random samples of 25 employees per workplace (census in workplaces with 5 to 25 employees) from a list given by the employer (Third sample of employee representatives)</p>	<p>In 2004: 1,733 workplaces, 64% 22,451 employees, 60% (1,000 employee representatives, 77%)</p>
<p>WES (Canada) from 1999 to 2005 http://www.statcan.gc.ca/</p>	<p>Sample of workplaces: stratified by size, industry and region from a business register, private and public sectors, more than 1 employee, Sample of employees: random samples of 4 to 24 employees from a list given by the employer</p>	<p>In 2005: 6,693 workplaces, 78% 24,197 employees, 81%</p>

At a European level, foundations were set in respect of the development of employer-level surveys in the mid 1990s. The CIS and the CVTS are examples of employer-surveys for which harmonisation efforts were stimulated and followed up by Eurostat. The recent European Company Survey (ECS) (Box 1) is another example of a European cross-national, harmonised, survey conducted by a European institution.

Box 1: The European Company Survey

The European Company Survey is managed by the European Foundation for the Improvement of Living and Working Conditions (EFILWC). It is not a linked survey but a European harmonised establishment survey. In 1996, a first cross-national establishment survey (EPOC) was carried out by the EFILWC on employee participation. A second one, the European Survey on Working Time and Work-life Balance (ESWT), was carried out in 2004-2005. Recently, the EFILWC has decided to conduct an establishment survey on a regular basis, called the European Company Survey (ECS). This survey could provide the primary sampling units for a linked employer/employee survey at the European level. Early in 2009, this new wave of regular surveys started with a focus on flexibility practices and social dialogue structures.

The ESES provides another important example from the perspective of the MEADOW Guidelines. The ESES is covered by Council Regulation N°530/1999 and is coordinated by Eurostat. ESES is the only harmonised European linked employer/employee survey. This survey has been carried out in 1995, 2002 and 2006 and progressively extended to all 27 Member States of the European Union. It provides a strong knowledge base in respect of the implementation of a linked employer/employee MEADOW survey. Flexibility in data collection is a central feature of ESES: information can be obtained from “tailor-made” questionnaires, existing surveys, administrative data or from a combination of these sources. The structure of earnings is the central topic of ESES. In some

countries, participating organisations provide general information about their wage policy and then assemble information from their own files about the individual earnings of a sample of employees or, in some cases, their whole workforce. In other countries, employer-provided information about wage policies is enriched by administrative data on the earnings of all employees working for the participating employer units. Some countries, such as France, survey a random sample of establishments and a random sample of employees within these establishments using a linked employer/employee register. However, whilst flexibility is central to the existence of ESES, it has some drawbacks as it creates certain barriers to comparability (Desai, 2008): at the most basic level, the definition of the survey unit can be variable. Thus, European-wide results obtained from the data sometimes fall below the standards applied at a national level due to differences in the units of observation, sampling frames and classifications. The consequences of these differences are difficult to assess, since much of the knowledge about them remains tacit, and is related to the routines and practices of national statistical offices in each country. However, Eurostat’s coordination of the survey promotes further convergence in these practices and progressively improves the documentation of cross-country differences through a series of quality reports (Eurostat Unit F2, 2006).

Another reason for choosing the employer as the PSU is that it seems obvious to explore the employer-level first in a survey focusing on organisational change, as it can be assumed that changes are more often initiated at the employer level than at the employee level. Further, it is reasonable to begin by interviewing persons both in a position to have an understanding of the organisation as a whole and to impart this information. A more pragmatic argument is that, in the field of work and organisation, most existing linked surveys at national level begin by surveying the employer. However, even if the theme of the survey implies that more information is collected from employers than from employees, it does not necessarily follow that the employer must occupy the first stage in the sampling procedure. For example, the WES survey collects more information from employees than from employers, but takes the employer as the PSU.

Taking the employer level as the focus of the first stage of sampling may also lead to several practical difficulties. Currently, the main difficulty is the absence of a European harmonised employer register. At the European level, no exhaustive and up-to-date database is available which includes: addresses of employer units (headquarters, subsidiaries, etc.); a classification of industries such as the NACE; and more generally, the information that is required to stratify and optimise sampling rates. At the national level, business registers are used most of the time, but they do not always cover all sectors (the public sector for example). Moreover, the question of access rights to national employer databases (e.g. Official Statistical Registers and Chamber of Commerce) requires further examination. Existing experiences mentioned above need to be assessed in these respects.

Choosing the employer as the first degree can also result in a bias in the employee sample towards employees who are more satisfied with their employer or their work (social climate bias), if they are selected from a list given by the employer. Thus, even if employees are randomly selected from this list, it will be practically much more difficult to obtain a random sample of employees because the employers provide the sampling

frame for the employee survey within their units. Three national level surveys, COI, LIAB and REPONSE obtain their second-stage samples of employees from linked employer/employee registers rather than from lists of employees given by participating employers. This is one solution to the potential problem of social climate bias, but it will not be easily applied at the European level due to the lack of this type of register in many countries. Chapter V of the Guidelines deals with sources of biases in linked employer/employee surveys.

If, at the European level, such biases imply that the randomness of both the employer and employee-level samples in a linked employer/employee survey setting cannot be assured, then a linked employee/employer survey could be considered as an alternative solution.

II.2 Linked employee/employer survey: another possibility

Although linked employer/employee surveys are more frequent than linked employee/employer surveys, some examples of the latter exist. Table 3 includes three of them. The option of linked employee/employer surveys has some advantages.

Table 3: Linked employee/employer surveys

	Sampling procedure	Net sample size of linked samples and response rate
AES-CVTS (France) European harmonised survey 2006	<p>Sample of employees (AES): Sample of employees, selected among the individuals belonging to the households who have been interviewed for the 6th and last wave of the LFS in 2006. Only one employee per household is selected. The requirements of AES are taken into account in the composition and size of the sample.</p> <p>Sample of employers (CVTS): all the firms of employees surveyed in the first degree (4000). An additional sample of employers (5000) is selected in a business register in order to reach the requirements of CVTS in terms of sample size and composition (stratified sample in terms of size and sector, firms with 10 and more employees in the private sector)</p>	<p>17,776 employees in AES, 97% 4,792 firms in CVTS, 56%</p> <p>The employer and employee surveys can be used either independently from one another or linked. Each sample is representative at its own level. 2,000 employees are linked with their employer</p>

<p>EFE (France) 2005 http://www.efe.ined.fr/</p>	<p>Sample of employees: random sample of employees aged 20 to 49 in households from the population census</p> <p>Sample of employers: all the establishments with at least 20 employees of the employees surveyed in the first degree (private and public sectors)</p>	<p>3,050 employees, 75% 2,673 establishments, 67%</p>
<p>NOS (US) 1991, 2002 http://www.icpsr.umich.edu/</p>	<p>Sample of employees: Employees are sampled from the General Social Survey (GSS). It is a multi-stage area probability sample to the block or segment level. At the block level, however, quota sampling is used with quotas based on sex, age, and employment status.</p> <p>Sample of employers: During the GSS interviews, half of all household respondents were asked to provide contact information for their place of employment including business name, address, and telephone number</p>	<p>In 2002: 2,765 individuals, 70,1% 516 workplaces, 62,4%</p>

First, in contrast to the situation in respect of employer databases, good quality household databases can be obtained in most European countries through the National Statistical Offices or other national institutions. Second, there are fewer problems in guaranteeing the anonymity of surveyed employees with respect to their employer. Thus, two potential sources of sample non-randomness at the employer and at the employee level are removed. Third, an employee-first approach allows one to cover a very large field of employers (all kind of establishments, in all sectors, as well as the self-employed) in a way that does not depend upon the availability of a business register and the extent to which it is up-to-date. Fourth, the sample of employers derived from a random sample of employees will be automatically proportionate to the size of employer units. The sample will reflect the employer unit's share in total employment and can be easily weighted to make it representative of the population of organisations (Leombruni, 2003). The US National Organizations Survey (NOS) carried out in 1991, which is to our knowledge the first nationwide linked survey of organisations, used a linked employee/employer method grounded in the General Social Survey (Smith et al., 2004). This survey was repeated in 2002 and is about to be carried out again. More recently, the French AES-CVTS and EFE surveys also used a linked employee/employer approach (Table 3). Fifth, when countries hold a business register, interviewed

employees in the labour force survey are often asked the name and address of their employer. This information is then translated into a firm or business identifier which is used to enrich the survey with accurate indicators of the industry and size of the firm/establishment/workplace. Thus, in these countries, the basic infrastructure for a linked employee/employer survey is already in place. General access to these data is likely to be restricted. Therefore, it is important to investigate the conditions under which wider access could be obtained. The EFILWC survey on working conditions (EWCS) and the European Social Survey (ESS) are other existing infrastructures (Box 2), which are publicly available (e.g. from the UK Data Archive). However, these linked employee/employer surveys are still rare. To conduct such a survey would clearly require more extensive field testing to make certain that this type of linkage could feasibly provide nationally and cross-nationally representative samples of employers and of employees.

Box 2: The European Working Conditions survey (EWCS) and the European Social Survey (ESS)

Since 1991, and every five years, the EFILWC conducts the European Working Conditions survey (EWCS) to study working conditions in Europe. The EWCS of 2005 was carried out in 31 European countries: the 27 EU member states, Croatia, Turkey, Switzerland and Norway.

The European Social Survey (ESS) is an academically-driven biennial multi-country survey covering over 30 nations. The first round was conducted in 2002/2003, the second in 2004/2005 and the third in 2006/2007. The survey has been funded through the European Commission's fifth and sixth Framework Programme, the European Science Foundation and national funding bodies in each country.

The EWCS and the ESS are not linked surveys but European harmonised surveys which include questions on work organisation addressed to employees. These surveys could become the first sampling degree for a linked employee/employer survey at the European level. However, as will be set out in Chapter V, at present their sample sizes are too small for this.

Nevertheless, the employee-first option may lead to some specific difficulties. It is not necessary to review those difficulties which are simply the counterpart of the advantages of an employer-first approach, namely: the representativeness of the employer sample; difficulties in following up employers over time; and budget optimisation. Instead, we highlight the risk of attrition and bias because of the refusal or inability of some employees to provide good contact information about their employer. There is also the fact that the distribution of businesses in terms of size is skewed and thus it is difficult to reach very large employer units for which a census is generally conducted in employer level surveys such as CIS. One possibility, which will be implemented in the forthcoming NOS survey, is to have a split frame, with a number of employer units reached through employees and other employer units targeted directly in order to capture important policy areas, such as multinationals or firms in the high tech or biotech sectors. A final disadvantage of the employee-first approach is that there will be only one worker interviewed in most of the employer units.

Although either linking option has concrete limits, both could provide linked data of good quality. Moreover, besides the methodological issues discussed above, practical issues such as sampling database availability, and legal constraints regarding the access rights for individual data, may also play a significant role in the choice of the survey design. For example, the opportunity to conduct a linked survey within the framework of a pre-existing international survey, such as the EWCS or the ECS, could be invaluable.

GUIDELINE:

A preference is given to a linked employer/employee survey in which the employer is sampled in the first stage and the employees in a second one. But this preference is conditional on the existence of a harmonised European register of employers. Due to the current lack of such a register, it is worth considering a linked employee/employer survey as a possible alternative solution.

III. The longitudinal aspect: retrospective questions and a panel design combined

Chapter I has stressed the importance of collecting information on organisational states as well as on organisational changes. The relation between the internal organisation of the employer unit and economic performance is a key issue in organisational design theories. This theoretical perspective converges with the standpoint of the policy community, which wants to identify best practices with a view to supporting their transfer across organisations and countries. The Guidelines propose a survey which should allow one to assess the relative performance of different forms/states in the organisation of employer units. But changes in the organisation also need to be identified. Measuring the dynamics of change at the employer unit is central if one is to make some assessment of organisational flexibility and adaptation. It is also important to measure change in order to identify the adjustment costs, for example training needs, renewal of the labour force, stress, accidents, feeling of work intensification and failures. If we want to understand barriers to the diffusion of organisational forms which seem virtuous in terms of performance, we must observe how firms are adopting and absorbing changes. Measuring changes without measuring states, as is the case in CIS, leads one to pool together employer units which remain inert and units which have undergone major changes in previous periods. Moreover, if some organisational practices require time to show an effect, then it is necessary to identify whether or not a given set of practices has been adopted recently in employer units. This section examines measures of change stemming from retrospective questions in cross-section surveys and from panel surveys. It then considers a solution which combines both approaches to the measurement of organisational change.

III.1 Retrospective questions in cross-section surveys

If we consider existing surveys on organisational change, there are many examples in which change is examined through retrospective questions. These questions can be found both in employer-level surveys, employee-level surveys and in employer or employee sections of linked surveys. Table 4 provides some examples. Retrospective questions at the employer-level about organisational changes have to be distinguished from retrospective questions at the employee-level in terms of subjective factors such as well-being or involvement as they do not raise the same measurement problems. Chapters III and IV give details on these difficulties.

Whereas a panel by definition consists of measurements at two or more points in time (e.g. over a time period of several years) to provide information on changes, the immediate availability of retrospective data is an argument in favour of the use of retrospective questions. Therefore, if this type of measure is obtained, analyses of changes in organisation and work can be conducted immediately after the survey has been completed. Moreover, a sole reliance on retrospective questions removes the requirement for repeat surveys and is therefore cheaper. Secondly, retrospective questions include the possibility of focusing on the most recent organisational innovations, as in the 2006 COI survey where, after having described many features of the organisation and its use of managerial practices at two dates, the employer is asked to focus on the major change which occurred during that period and to describe the difficulties encountered. This cannot be done in a panel design which only seeks to measure states, at least when organisational innovation takes place between panel measurements.

A third advantage – albeit one which only concerns the employer-level - is that retrospective questions can provide more coherent and comparable information on activities carried out by organisations and workers, because an individual provides all of the information at a single point in time. Thus, there is no bias linked to a change of respondent between two different waves, as can occur in an employer-focused panel survey, and changes in the general context in which the organisation operates are not likely to influence the interpretation of a given question.

Table 4: Retrospective questions in cross-section surveys

	Longitudinal information	Net sample size
Employer-level surveys or sections in linked surveys		
EMS (2002-2003)	There is no systematic approach. Some questions ask for the year in which a technology or organisational concept was used for the first time. Some questions ask whether the organisation offered more services in the last 3 years, and in the period more than 3 years ago. For some financial indicators it is asked whether there has been a decrease or increase during the last 3 years. Most applied reference period is therefore 3 years, but most questions are not retrospective.	N=2,249
CIS4 (2005)	Most questions deal with a 3 year period and therefore contain the phrase “during the period 2002-2004 did your enterprise...?”	N=125,000
COI (2006) Employer section	A large section of the questionnaire asks for the situation “now” and 3 years before. Two answers are therefore needed, one for the current situation, and one for the situation 3 years before Reference period is 3 years	N=13,700w
MOA (1995-1997) Employer section	Evaluation of an increase, decrease or unchanged situations over the last 12 months. For example the question, What proportion of your total sales/ activities during the last 12 months was made up of standardised or customer-tailored services/products (customer tailored= the customer was involved in the design of the service or product)? Standardised: 0%; 1-20%; 21-40%; 41-60%; 61-100%. Change? Decreased; Unchanged; Increased (Idem for customer-tailored)	N=82
FLEX-2	A number of questions focus on organisational change: “... have there been significant changes during 1995 – 1997?” Reference period is 3 years	N=911

WERS	Questions on changes that have occurred in the last 2 years, for example "Over the past two years has management here introduced any of the changes listed on this card?" 1) Introduction of performance related pay; 2) Introduction or upgrading of computers; 3) Introduction or upgrading of other types of new technology; 4) Changes in working time arrangements; 5) Changes in the organisation of work; 6) Changes in work techniques or procedures; 7) Introduction of initiatives to involve employees; 8) Introduction of technologically new or significantly improved product or service; 9) None; "Which one of these had the greatest impact on employees working here?"	N=1,733
Employee-level surveys or sections in linked surveys		
British skills survey (2006)	Four types of questions on change are applied: - questions assessing the current state (t1) + Questions assessing the state 5 (or 4 or 3) years ago ('t0'): strength of change can be assessed by comparing the answers on the Likert scales used; - questions assessing the occurrence of events/change during last 5 (or if 4 or 3) years + strength of event/change (major vs. minor); - questions assessing the direction of change with some measurement of strength of change; neither measurement of state at 't0' nor at t1; - questions assessing direction of change of concept with a generalised question (computer skills) with measurement of strength of change; no measurement of state at 't0'. Measurement of state at t1 with detailed questions/different wording.	N=7,800
COI (2006) Employee section	The following principles are applied: - questions on the occurrence of change/events during last 12 months but without measurement of state at 't0' and t1; - questions assessing the occurrence of an event + the assessment of the year of the most recent event; - questions on the direction of change in the last 3 years. First the 't1' 'state' is assessed (extent of change is not assessed: no measurement of state at 't0'); - questions with 'attribution': assessing cause-effect relationship in one question;	N=19,780

MOA (1995-1997) Employee section	In the MOA the following principles can be found: - questions assessing the incidence of events/change(s) in last year, but without measurement of strength or type of event(s)/change(s) - questions assessing changes in recent past including direction of change; strength of change not assessed, however it concerns an instrument for a cohort study. Elsewhere in the questionnaire the t1 state is assessed albeit with a sometimes different phrasing of the concepts. - questions attempting directly to attribute effects to organisational changes (risk of subjective answers), e.g.: "How do changes at the workplace affect you? (changes during the last year or ongoing changes): (..) c) I can't perform the job tasks as good as I want to.	N=6,500
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A drawback of using retrospective questions, however, is that when organisational changes lead to personal mobility among the management of the workplace, the respondent may not have experienced the change and may only have limited or no knowledge of it. Thus, if retrospective questions may serve to limit some biases in the measurement of change, the *quid pro quo* is that information may be missing or incomplete. Some organisations, however, document the changes they have implemented and their access to this documentation facilitates response even in the presence of personal mobility. A principal drawback of retrospective questions concerns the risk of 'recall error': memories may be short leading to omission, or unauthentic leading to a 'telescoping effect', in which respondents report things in the current period that actually took place in a prior period (especially when people are dealing with daily problems and plan for the future). Moser and Kalton (1971) refer to these dual problems. They noted that 'recall loss' or 'omission' is likely to be greater if the recall period is longer, while the telescoping effect can be greater for shorter recall periods. They identify diary methods as an approach that has been used in surveys of individuals to address the problem of recall loss. Another approach is bounded recall where the respondent is reminded of some information concerning the previous period, but in this case additional panel information is needed.

Hoinville and Jowell (1978) also dealt with the issue of problems of memory. Their common-sense advice is to only ask about events of special significance (since recall errors are likely to be significant in respect of minor events) and to take particular care over retrospective questions about attitudes. The advised steps to limit telescoping include asking the respondent to locate the timing of an event by relating it to the timing of other major events; getting them to refer to documentary evidence; and asking them to keep a diary. But this approach might be more relevant for a household survey. Finally, Martin (2006) emphasises that the 'memorability' of an event depends on a mixture of its recentness and its significance, but that the date of an event is usually one of the least recalled features.

As a result, when questions about change are formulated in a general way, such as “Has the work organisation changed in the company since ...?”, there is a tendency for respondents to exaggerate the degree of change. However, when questions are formulated in a specific and objective way and are precise in respect of their reference dates, biases of memory are limited. Another feature that must be noted in retrospective questions is that they tend to underestimate negative change. For example, when an employer is asked about the use of a given practice at two dates in time, he/she will more easily identify practices that have been adopted than practices that have been abandoned, his/her implicit reference period being today’s situation where abandoned practices are no longer observable.

III.2 Panel surveys

Panel data have their advantages, as shown by the numerous existing surveys on the dynamics of organisations and work which are based on this principle. Table 5 presents some of them: employer panels, employee panels and panels with linked employer and employee surveys (see also Table 1).

One advantage of a panel design is that it does not rely upon memories. Furthermore the panel measurements can also provide precise information on the characteristics of employers’ and employees’ at each date, which is important because changes in such characteristics may explain observed changes in work or organisation.

However, change can only be measured when the second wave of the survey is conducted, so it is always worthwhile to include some retrospective questions in the first wave of data collection. Moreover, panels can only measure changes which can be consistently defined over time, and there is then a significant emphasis on fixing the content of the questionnaire at wave one. But as we are designing a survey on changes, it is likely that a fraction of the survey will have to evolve over time. For example, management practices follow fads (Abrahamson and Fairchild, 1999) and from one wave to the other some practices may have become obsolete while others may evolve during their diffusion process. Using two waves of the WERS survey, Freitas (2008) investigates employers’ use of “quality circles” and “Business Process reengineering” through measures based on questions that are identically formulated in 1990 and 1998. She finds that the patterns of use of these practices have changed over time. An explanation is that these practices refer to management concepts that are soft rather than precisely defined and which are constantly recycled as they diffuse, in relation to changes in the social and competitive environment. This raises the issue of a need for stable questions on practices in surveys on organisational change. A longitudinal survey of these practices calls for a renewal of some questions from one survey to the other, even if they relate to the same management concept. Qualitative investigation need to be conducted in preparing survey questionnaires, along with an analysis of management publications, in order to monitor the evolution and renewal of management concepts.

Another argument in favour of panel surveys is the possibility of analysing changes not only within the organisation, but also between them (and especially between the older ones and those more recently established). Of course, this implies that employers from

previous waves are followed up while the panel is refreshed with new employers, some of these being newly-created organisations (Figure 1). Indeed, such data should enable one to observe the demographics of organisations and thus to estimate the effects of the structural transformation of the economy on the dynamics of organisations and work.

Table 5: Panel surveys

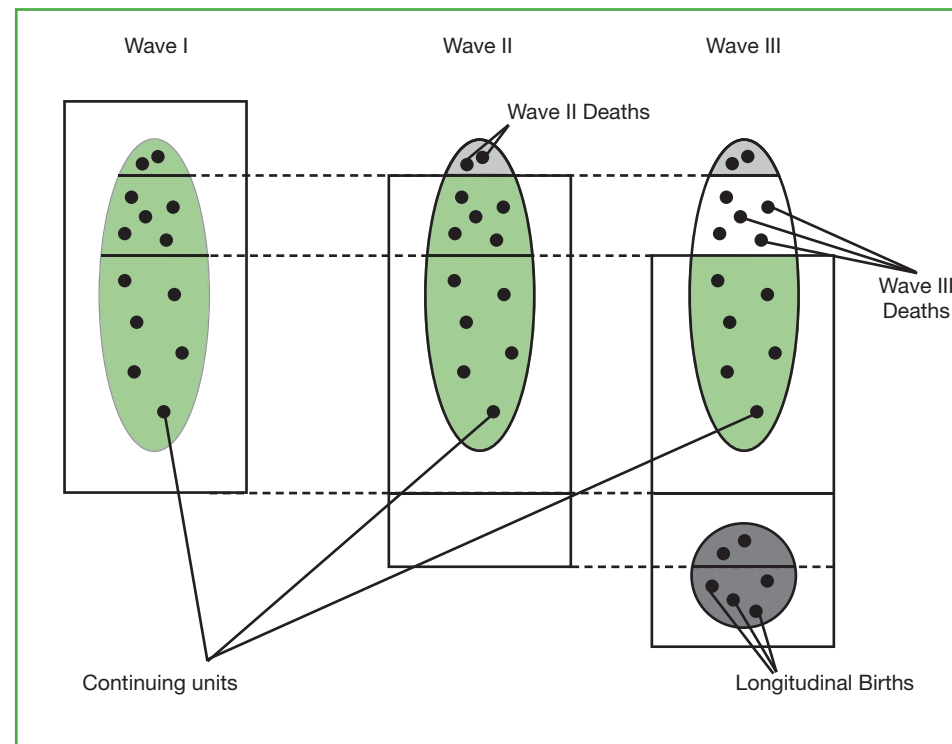
	Longitudinal information	Net sample sizes, attrition rate
Employer-level surveys or sections in linked surveys		
DISKO	No regular period of repetition. The DISKO-survey of 1996 was used to establish a partial panel survey PIE in 2001, repeated in 2006. All employers in private sector over 20 employees were approached and ex-post determined whether the same firms were included in both surveys.	N=1,369 of 1,900 employers from first survey are still valid, of which 637 respond Attrition rate: 67%
OSA Er labour demand panel	First wave in 1989; conducted every 2 years (year alters with year of data collection of OSA labour supply panel (employees)).	N=3,131 in 2005; including 1,199 new recruits in 2005 Attrition rate 2005: 38%
PASO	Survey conducted during 3 consecutive years 2002, 2003 and 2004. The same respondent is approached in subsequent years.	N=2,004 employers followed up Attrition rate: 50%
IAB Employer section	Survey conducted every year since 1993 Employers are followed up in a business register	N=15,500 employers followed up Attrition rate: 15% to 20%
REPOSE Employer section	Survey conducted every six years 1992, 1998, 2004	N=1700 of 3,000 employers from 1998 are still valid in 2004, of which 1000 responded Attrition rate: 66%
WERS Employer section	Cross-section survey conducted in 1980, 1984, 1990, 1998 and 2004. Two-wave panel for 1984-1990, 1990-1998 and 1998-2004. The panel sample is taken from the realised sample in the previous cross-section. Panel workplaces are excluded from the sample for the concurrent cross-section to prevent duplication.	About 2,200 employers in 2004, about 1000 in the panel Attrition rate: 37%

WES Employer section	Survey conducted every year until 2005 Employers followed up in a business register	6,000 employers followed up Attrition rate : 20 to 30%
Employee-level surveys or sections in linked surveys		
NWCS cross-section NWCS cohort	NWCS cross-section since 2003, since 2005 yearly NWCS cohort (longitudinal part) since 2007: 3 waves: October 2007, 2008 and 2009	NWCS cross-section: yearly N=23,000 NWCS cohort: 54% attrition rate (in 2008 wave)
OSA Ee labour supply panel	First wave in 1985; since 1986 every 2 years (year alters with year of data collection of OSA labour demand –employer--panel).	N=4,332 among which 1,955 new recruits in 2004 Attrition rate: 35% in 2006
WES Employee section	First wave in 1999: 1 year follow-up (sample kept for 2 years, then completely refreshed). Panel waves from 1999 to 2004.	N=16,804 in 2004 Attrition rate: 19% in 2004

Here again there is a drawback: it is expensive and time consuming to trace employers, employees or both. Even with adequate resources and appropriate procedures, there will be some attrition, which means that a part of the initial sample is lost in each of the following waves since some particular companies, workplaces or employees prefer to stop participating in the panel after a while. However, attrition does not necessarily imply a bias. It depends on who falls out and whether their characteristics are correlated with the behaviour one wants to observe. For example, in its long labour supply and demand panels, OSA has not found that attrition has been concentrated in specific size groups or sectors. An additional point is that the initial sample has to be large enough to cope with any attrition, both in aggregate and within each stratum. So the initial sampling is more complex in a panel. The refreshment strategy, taking into account birth, death and attrition, is another important issue and attention has to be given to the computation of dynamic weights.

The attrition rates are calculated according to the formula:
 $1 - (\text{response at wave } t2 / \text{number of responses at wave } t1)$. In other words, 'attrition' includes both non-response and units falling out of scope (e.g. closing down).

Figure 1: Demography of units in a panel



Source: Decady 2007

The panel aspect in linked surveys is usually limited to the employer part of the surveys. In each wave the employees are typically sampled anew from the participating organisations. In consequence, the employee part of the survey usually only allows for cross-sectional analyses, except in the case of retrospective questions which will provide a time dimension. Due to the greater mobility of employees, the establishment of a panel of employees is difficult to achieve. Box 3 gives information about the WES survey, the only linked survey with both an employer and an employee panel. In this case employees are only followed for two waves. In a linked survey, it is difficult to follow-up both employers and employees during long periods and to maintain the linkage. Thus, it could be interesting to compare any information collected from short panels of employees with information collected from retrospective questions in employee questionnaires.

Box 3: An employer and an employee panel in the WES survey

The Canadian WES makes an attempt to follow the employees selected from previous waves, but only does so for two consecutive waves. The WES asks the employer in each selected workplace, during the interview, for a numbered list of their employees. A Simple Random Sample of 1, 2, 3, 6, 9, 15 or 24 employees is taken (without replacement) from this list, with the actual sample size depending upon the size of the workplace. This sample is, however, only kept for two years and then completely refreshed. In the second year, employees who have not changed workplaces receive the same questionnaire. The remainder are given an exit questionnaire. A significant proportion of the workplaces have an insufficient list of new hires, or no list at all, and therefore, rather than implementing two different sampling strategies depending on the information available, the employee sample is completely redrawn in the third year. Of course, there will be an overlap between these employee samples, especially in small workplaces. The employees reselected in the new sample will provide employee-focused estimates for the original longitudinal population for at least four years or until they leave their workplace or the workplace closes down.

III.3 A solution mixing retrospective questions and a panel

In order to derive benefit from the advantages of each option and to limit the subsequent disadvantages, the Guidelines propose to combine the use of retrospective questions and a panel design. This has for example been done, in the WERS and REPOSE employer surveys and the WES and OSA employee surveys (Table 6).

A panel survey is convenient for the (short and) mid-term perspective, while retrospective questions are convenient for the short-term perspective on change. Thus, it would be interesting to start a mid-term panel survey with questionnaires including short-term retrospective questions. The example of the REPOSE employer survey illustrates this approach: each 6 years it issues a questionnaire that includes 3-year retrospective questions as well as questions on the current situation.

Indeed, this survey design has many advantages. First, data from the first wave are available quickly to analyse the dynamics of organisations and work in the recent past. Next, the repetition of the survey in a second wave is useful as it becomes possible to monitor trends in changes and it is also possible to undertake longitudinal analyses which can investigate the causality of relationships. Finally, asking the retrospective questions in a subsequent wave fills the gaps in the longer timeline and provides useful, additional information.

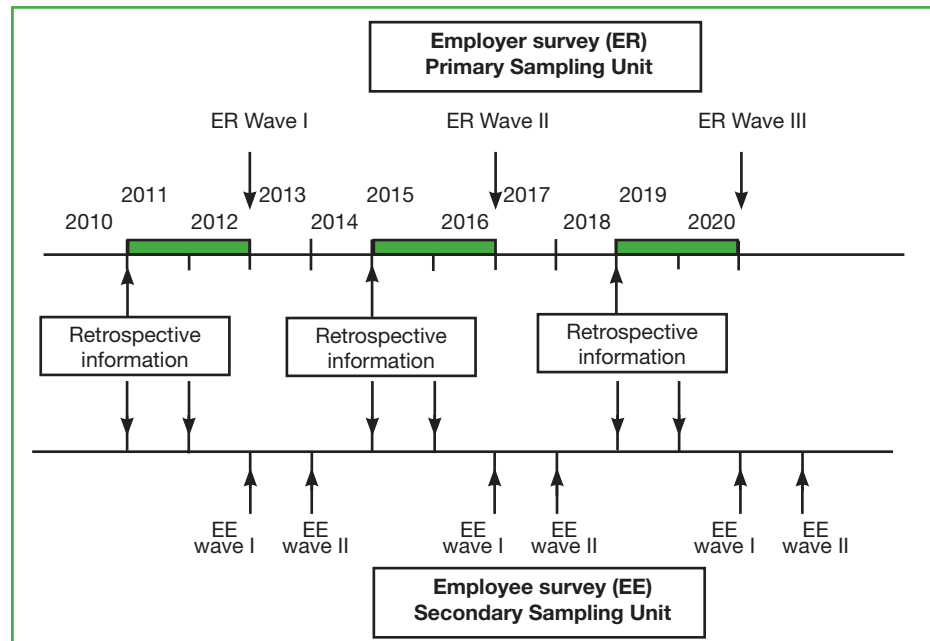
Table 6: Panel surveys with retrospective questions

	Retrospective information	Panel dimension
Employer-level surveys or sections in linked surveys		
REPOSE	Retrospective information is gathered by some questions on a 3-year reference period (1990-1992, 1996-1998 and 2002-2004)	Every 6 years 1992, 1998 and 2004
WERS	<ul style="list-style-type: none"> - Retrospective information is gathered by some questions on a 6-year reference period (1984-90, 1990-98 and 1998-2004) - The panel only collects information about the current state, although the 1990-1998 did include some questions to ask why practices had changed between the two years, and each panel includes a question to ask whether there has been a merger, takeover, amalgamation, split, relocation etc. 	Every 6 years, except first 2 waves 1980, 1984, 1990, 1998, 2004
Employee-level surveys or sections in linked surveys		
NWCS cross-section and cohort	<ul style="list-style-type: none"> - Questions assessing the incidence of events/change(s) in last year (but without measurement of strength of event(s)/change(s)) nor of 'state' at t0: for example, it might be the case that at 't0' already many of the company activities have been relocated etc.), e.g. In the last 12 months did one or more of the following changes occur in your company (establishment/location)? (multiple answers possible) - a large reorganization; - takeover by another organization; (..) - downsizing with coerced layoffs; (..) - relocation company's activities to foreign country; - automation of company's activities; - none of the above changes (yes; no)" - Questions assessing change in last 2 year but neither assessment of state at 't0' nor of 'state' at t1; nor of strength of change, e.g.; "Has your job been enlarged in the last 2 years?" 	Cross-section: yearly since 2003, plus NWCS cohort added in 2007 (3 waves: 2007, 2008, 2009)
OSA Ee labour supply panel	<ul style="list-style-type: none"> - Labour market situation 2 years ago - Assessment of kind and date of labour market changes that have lasted at least one month in last two years. 	First wave in 1985, every 2 years
WES Employee section	<ul style="list-style-type: none"> - Questions on incidence of events/change(s) in last year, but without measurement of strength of event(s)/change(s)) nor of 'state' at t0. - Questions on changes since respondent started working. Assessment of state at t1 by questions elsewhere in the questionnaire (different wording), t0 information can be derived from panel (1 year follow-up) although time intervals are not the same) - Section with on job comparison (not for respondents whose job title and most important activities or duties have not changed or who respond for the first year) 	First wave in 1999, 2 year panel and then the sample is completely refreshed

Regarding the follow-up period between the waves, a balance has to be found. It should not be too short (for example one or two years) since such regular observations are not required to measure organisational changes. Moreover, such an option would be costly and leads to practical difficulties and an extra burden for companies. However, a low frequency (for example six or eight years) is not convenient either since it would probably lead to important attrition biases (one may encounter major difficulties in tracing employers, and even more so in tracing employees). It would also leave part of the timeline unobserved and suffer from the obsolescence of a large fraction of the questions.

Therefore, the proposed survey design (Box 4) consists of a four-year follow-up period between the employer survey waves combined with the use of retrospective questions which have a (maximum) recall-period of two years. This is an adequate means of measuring the organisation of work, which may change quickly but also needs time to show its effects. With a four-year cycle, two waves of the survey provide four distinct time points, each separated by a two-year period. In this survey design, information on changes over periods of two years might not be fully comparable from one period to the other. For example, changes between 2010 and 2012 are assessed through retrospective questions addressed to a unique respondent while changes between 2012 and 2014 are based on the comparison between a state variable given by one respondent describing the situation at the date of the survey in wave 1 and a state variable given by another respondent in wave 2 and deriving from a retrospective question. The comparability of these two different measures of change over a time period of two years would need further assessment.

Box 4: Proposed survey design



As showed in figure 1, following the WES survey (Box 4), a one-year follow up for the employee survey could be considered, leading to a two-wave employee panel. This design makes it possible to analyse short-term effects at the employee-level using the panel dimension of the data.

This proposed survey framework would need to be adapted if the employee-level is the PSU, for it would then be more difficult to follow up employers over time.

GUIDELINE:

The measure of organisational change should be based on longitudinal information, that is, information about the present state as well as the past state. There are two different ways to achieve this aim, either through retrospective questions in cross-section surveys, or through panel surveys. A model survey framework is proposed, which combines both of them.

IV. Other key elements of the survey design

This section explores the various sampling issues that are pertinent when measuring changes in organisations and work. It first examines the issue of the relevant unit to survey and the choice of respondent at the employer level in order to collect the targeted information on the dynamics of organisations and work. It then moves to representativeness issues with the aim of covering a broad population and coordinating employer and employee samples in terms of coverage and size. Finally, it considers some issues in respect of data collection methods and argues for flexibility in order to secure harmonisation at EU level.

IV.1 Unit to survey and respondent

1) For employers: focus on workplaces and interview of the General Manager or the person directing the local unit

Workplaces, establishments and companies

Although some employer surveys such as DISKO measure the dynamics of organisations through questionnaires addressed to companies or firms, most of them take establishments or workplaces as the sampled unit. Box 5 provides definitions; Table 7 provides examples of the choices made in surveys.

Box 5: Workplace, establishment, firm or group

A workplace is a statistical unit defined by location: it is a local unit or a business location. A firm or an establishment is a legal unit, establishments being nested within firms. Some workplaces include more than one establishment of a single employer, sometimes a whole company (aggregate units), while they may also host just a fraction of one establishment (partial unit). In some countries workplaces and establishments are considered as meaning the same. A group of companies (or business group or corporate group) is a cluster of legally distinct firms with a managerial relationship or financial links. The workplace is the only unit with a uniform definition across countries. The definition of establishment, firms or companies or group is contingent on the legal environment and the corporate governance system.

These definitions apply for the private sector. In the public sector, the notion of establishment is valid, but legal definitions of what is a public sector establishment vary considerably from one country to the other. Moreover, registers for public sector units are often separate from business registers. As for workplaces in the public sector, they can be defined as in the private sector.

This unbalanced situation reveals that workplaces are relevant units to investigate when trying to assess the implementation of organisational changes. There are two main underlying reasons. First, organisational practices are more accurately measured at the workplace level, where it is easier to ask the employer about the share of employees covered by particular practice. Second, in a linked employer/employee survey there is a greater chance that an employee will be affected by an employer practice identified at the workplace level rather than at a higher level. As a result, measured correlations between employee-level indicators and employer-level indicators are expected to be stronger at the workplace level than at the company level. In our case, a third issue puts the balance in favour of the workplace: in the absence of linked employer/employee register, it will be easier to sample employees from a workplace (which implies a unique location) than from a company (which may comprise more than one workplace in different locations).

Table 7: Sampled units at the employer-level in surveys on organisational change

Firm or company	Establishment	Workplace
COI	REPONSE	WERS
DISKO	PASO	WES
	TNO/WIS	NOS
	LIAB	NUTEK
		MOA

The availability of an official business register from which to sample the employer unit will play a central role in choosing to sample legal units (establishments or firms) rather than statistical units (workplaces). In some countries the official business register is linked to an employee register, making it very easy to draw two-stage random samples of employers and employees. These matched employer/employee registers are available in the Scandinavian countries, Germany, France and the Netherlands, with differing access rights for sampling purposes. In France, the samples for COI and REPONSE are

drawn from such a linked register (the Déclarations Annuelles de Données Sociales - DADS), with COI choosing to administer its employer survey at firm-level and REPONSE opting for the establishment level. In the LIAB survey infrastructure, administrative data from one level enriches surveys from the other level: the IAB establishment panel survey is matched with the Employment Statistics Register, an administrative panel dataset of all employees in Germany paying social security contributions.

When a business register is available, workplaces, establishments and firms are three different types of unit that can be sampled. If workplaces or establishments are the units of observation, there are three possibilities: (1) interview all of the sub-units of a firm; (2) select units at random from within firms; or (3) sample directly at the sub-unit level. In the first case, the PSU is the firm; in the second case the PSU is still the firm but the workplace or the establishment is a secondary sampling unit; and in the third case, the PSU is the workplace or the establishment. Next, employees are reached through the surveyed employers (hence one obtains a linked employer/employee survey). The employer questionnaire is addressed to a person able to describe what is going on at the local unit and this person is asked to supply a complete list of their employees. When a linked register is available, the employee can be directly contacted at the address given in the register.

In the absence of a business register, a linked employee/employer survey is the only option. The interviewed employee is asked to give the name and address of his employer, this address leading to a particular location and a corresponding workplace. It is also possible to ask the employee to give more information about what a workplace means to her or him. Questions will not have strictly the same meaning depending on the nature of the linkage: whatever the choice made concerning the employer unit to survey, these units are less easy to control, but can be more “flexible” if employees are interviewed first. Indeed, employees may provide information which is less precise (in a legal sense), but more relevant for themselves (in a socio-economic way).

Even though most surveys on organisational issues choose to survey the establishment or the workplace, taking the firm or the company as the sampling unit has several advantages. First, the firm is usually the unit where strategic decisions are made. Thus, high quality information on how change has been initiated can be obtained at the firm level. Sometimes the decisions are made at a higher level than the company, especially in multi-national companies. In this case, the level of the business group could be a source of more accurate information (Marginson, 1998). In an increasingly networked economy, many changes in work are related to changes in the relationship between organisations and their environment. Practices such as subcontracting, outsourcing, delocalisation or the integration of organisations in networks and global value chains, require a wider scope than the workplace to be monitored and analysed. However, data on links between establishments within a firm or between companies within a business group are still scarce. For example, although the LIAB is a rich data source linking employees to establishments, it cannot yet identify establishments that belong to the same company or crossed ownership and mergers between companies. Some research is currently being carried out, merging different data sources to create a company identifier in Germany. Second, accounting usually takes place at the firm or company level

where taxes are paid. Thus, economic performance is more easily measured at the firm level than at the establishment or workplace level. It is precisely because accounting activities generally take place at the firm level that official business registers focus on this level (with some exceptions like the German and UK cases).

The best of both worlds would be to mix the advantages of the workplace/establishment level and of the firm/company level. One possibility is to interview a workplace or an establishment, but to include some questions on the firm or company level, which is done for example in the OSA labour demand panel. It is also possible to randomly select those workplaces from within the firm which will receive a workplace questionnaire, while administering another survey at the company level to collect information on strategy or on performance. In the NUTEK 1998 survey a third option was taken: a first contact, by telephone was made to screen active workplaces in the previous year that had financial responsibility, in the sense of being responsible for income and costs. A self administered questionnaire was then sent to these workplaces.

The Guidelines indicate a preference for the workplace level in cases where there is no linked employer/employee register available for sampling employees. In this case, it is easier to obtain a list of the employees from the local unit than from a higher-level unit. But when a linked register is available, arguments in favour of the workplace or the company level are balanced. The best of both worlds could be sought, implying a flexible view on the employer sampling unit, as far as the same sampling method for employers is applied across Europe. In any case, there will be no real cost differences in administering the employer questionnaire at one level or at the other. However, as the proposed employer questionnaire in chapter III is designed for the workplace level, some slight rephrasing would be required to administer it at the company level.

Who knows about changes in organisations and work at the employer level?

A fixed description of the respondent is not established in advance in many employer level surveys, due to the absence of the names and positions of potential respondents on the sampling frame. Many surveys are therefore confined to vague descriptions along the lines of a “key person”, “spokesman” or “representative” of the organisation (Table 8). This is also because the most informed person may not hold the same role in each workplace. One workplace may have an HR manager, another may not. In face-to-face interviews, the interviewer can assist with the identification of the most suitable respondent, and some surveys allow for the possibility of interviewing several respondents.

The most relevant person depends on the main topic of the survey. Because organisational change may impact upon the organisation as a whole, the Guidelines suggest that the General Manager or the person directing the workplace should be interviewed. He/she can be advised to develop his/her response through some interaction with specialised staff, from the Human Resource department or the IT department for example. A question could be included at the end of the employer questionnaire to record information about how the employer’s response was processed, as is the case in the COI survey. In other words: who was the main respondent and did the respondent seek assistance from other persons with specific positions? This is particularly important when the questionnaire is self-administered. In a face-to-face interview, it may be possible to arrange for the presence of multiple persons during the interview.

Table 8: Main Respondent in Employer-level surveys on organisational change

General manager or person responsible for the workplace	Manager responsible for personnel issues	Other (who?)
COI TNO / WIS (2002) WES	WERS REPOSE PASO TNO / WIS (1998) NOS	DISKO (Employer representative in charge of personnel or organisational matters in the firm) NUTEK 1998 (A person who has an overview of how the work is organised at the enterprise and of how change is dealt with) MOA (Executives, HR and production management representatives)

2) For employees: No proxy admitted

In order to obtain high quality data, it is recommended that no one else should be permitted to answer on behalf of (or to replace) an employee, because work situations and experiences have an irreplaceable individual dimension. Another important reason, when employees are sampled from a list supplied by the employer, is that allowing replacements gives the employer an additional opportunity to manipulate the sample. Thus, it is proposed that the employee should not be replaced, both in order to calculate an accurate non-response rate and to better assess the quality of the results (a replacement could introduce a bias into the survey sample).

In linked employee/employer surveys, the basic sampling unit at the employee-level could be the household, as in labour force surveys. In this case, it is necessary to establish a rule by which employees are selected. For example: (a) in the EFE survey, which is concerned with work-life balance and has employees with young children as the target population, all employees aged 20 to 49 are interviewed; (b) in the AES-CVTS survey, in which the main theme is training practices, a randomly selected employee per household is interviewed; (c) in the OSA labour supply panel, where an important theme is labour market issues such as labour market transitions, one or more persons aged between 16 and 66 are selected per household.

The measurement frame presented in Chapter I has laid some basic principles about the coordination of the employer and employee level questionnaires which are presented in detail in chapters III and IV. Complementarities in the data gathered at the two levels is a central principle. This implies that the burden upon respondents has to be balanced at the two levels: at a given level a linked survey should entail a lighter burden than a single-level survey because questions can be asked at the most adequate level, where the answer is the easiest to formulate. This choice implies that question redundancy between the two levels is to be avoided.

GUIDELINES:

- In cases where there is no linked employer/employee register available for sampling employees, the workplace is preferred as the sampling unit for the employer survey. This is because it is easier to obtain a list of employees at this level. The respondent should be either the General Manager or the person directing the local unit. When a linked register is available arguments in favour of the workplace level or the company level are balanced. The best of both worlds could be sought, implying a flexible view on the employer sampling unit, as far as the same sampling method for employers is applied across Europe.
- For the employee survey, the option of proxy respondents is excluded: the employee must be directly interviewed.
- Complementarities in data gathered at the employer and the employee levels is a central principle for the coordination of the two questionnaires.

II.2 Representativeness**1) A broad population coverage: employer units with 20 employees or more covering whole countries and the whole economy, including the public sector and all the employees working at these units*****Coverage of whole countries if possible***

The geographical coverage of the employer survey should be as wide as possible, yet two general principles apply:

- The spatial structure and the size of samples within geographical units should be consistent with the needs for spatial indicators at the European level.
- The coverage of those regions which are particularly difficult and expensive to survey, such as outlying islands or overseas territories, needs further deliberation.

It is a remaining question as to whether the survey should cover some or all the European countries: the EU-27 or, as in the case for the EWCS of 2005, also the current candidate countries (Croatia and Turkey) and Norway and Switzerland.

Coverage of the whole economy, including the public sector

The employer samples should be representative of the whole economy, including most of the sectors: private, public, and semi-public; manufacturing, construction, services including education, health and social services. However, public sector and non-profit organisations need a specific approach because the sampling methodology for the private sector may not apply, as there may be a separate register and different indicators of activity.

Table 9: Sector coverage of employer-level surveys on organisational change

Private sector	Including agriculture	Covering also public sector
All employer-level surveys on organisational change Some surveys focus on manufacturing, as EMS	PASO NOS	COI (2006) WERS PASO NUTEK (1998) TNO/WIS (1998) MOA WES

In general, agriculture is excluded from existing surveys on work organisation. The issue of whether to cover this sector would need further discussions in the context of EU-27 as it employs a large fraction of the workforce in some of the new member states and candidate countries.

Coverage of employer units with 20 employees and more

Large and medium sized workplaces should be covered. The coverage of micro-companies (less than 10 employees), the self-employed and family businesses generate some specific difficulties. On the one hand, it is difficult to use the same concepts for very small organisations which are characterised by higher levels of informality. On the other hand, these units need to be included to ensure comprehensive coverage of some specific sectors where they are particularly prevalent (personal services for example). The question of the coverage of agriculture in new member states and candidate countries is also connected with this issue of employer size. In 2004 in the EU-27, 19 millions companies belonged to the private sector, excluding agriculture and financial intermediaries (NACE classes from C to K, excluding J); some 17.5 million employed less than 10 employees whilst 41,000 employed more than 250 employees. However, large companies will employ the majority of all employees, thus the practical difficulties of including smaller units are more acceptable as reasons for omitting them from the survey.

A specific employer questionnaire could be envisaged for smaller units. The experience of the COI survey showed that it is difficult to link employer and employee data below a size threshold of 20 employees. While investigating the extension of the survey to the service sector in the 1997 survey, some units with less than 20 employees were included in the linked survey frame. Feedback from employers and employees showed that, even if confidentiality was secured in the practical means of administering the survey, it was more difficult to guarantee the independence of the two levels of the survey (some employees happened to also be the respondent for the employer survey), or to guarantee the anonymity of the employee (some employees felt that they had to inform their employer about being interviewed while others chose to exchange information about their (non-) response to the survey).

Table 10: Size coverage of employer-level surveys on organisational change

1 employee and more	5-10 employees and more	20 employees and more	50 employees and more
NOS PASO WES	COI 2006 (employer sample) TNO/WIS WERS MOA	COI 2006 (matched sample) DISKO NUTEK (1998) REPOSE	NUTEK (1996)

All employees at the employer unit, without exclusions except may be a minimum job tenure

The Guidelines recommend that a survey should cover all employees working at the employer unit at the time of data collection. This implies the inclusion of temporary workers currently working in the workplace or company even if they are employed by a temporary-employment agency, because they take part in organisational changes and are full members of the organisation on that basis. Such an option implies that special care must be taken in the sampling of employees when employers are sampled first, since it is more difficult to trace personnel – such as those from a temporary employment agency - who are not on the company's direct payroll.

In linked surveys, the population covered will depend on the methodology used (Table 11). For example, in the COI survey, employees are sampled from a linked register which provides data with a lag of one year. Thus interviewed employees have at least one year of seniority. In such a setting, it is possible to identify employees who have left the employer unit between the date when they were sampled and interviewed. In some countries like Denmark, registers allow one to follow employees after they have left the workplace or before they enter it. In the Danish case, the register is the Danish labour market database (IDA). Such registers also allow one to target the population of new hires and exiting employees who could provide valuable complementary information about organisational change.

More generally, the randomness and the representativeness of the sample of employees are easier to secure in a survey setting where the employee is the first sampling level. As mentioned earlier, this is because the dispersion of sampling rates is always higher at the second stage of sampling and because there are two sources of non-response bias in this second stage sample.

Finally, there should be no over-sampling of particular groups of employees. It could be interesting to over-sample employees in specific situations that one expects to be rare: examples might include migrant workers, tele-workers or users of the latest wave of new technologies. However, it is unlikely that information will be available to permit such over-sampling at the employer level, or in the sampling frame when employees are the PSU.

Table 11: Population covered in employee-level surveys or employee sections in linked surveys

Employee-level surveys	
BSS	People in paid employment aged 20-60 (20-65 in 2006 survey)
EWCS	Salaried employees, freelancers and self-employed
NWCS	Salaried employees (sampling frame: 'Bananbestand', Job register containing information with a two years lag)
OSA Eel	Potential labour force: all members of household between 16 and 64 (who were not following full-time education) until 2002, when household became individual panel and other household members were no longer required to be surveyed but were included if possible. In 2004 the selection was enriched with ages up to 66 and includes students.
Linked employer/employee surveys, employee section	
COI	Employees are selected in a social taxes register matching companies and employees one year before they are interviewed. They need to be employed in the firm on the 31st of December of the year preceding the survey and they must have worked a non negligible amount of hours. Thus employees who still work in the firm for which they have been selected have at least one year of seniority. Employees who have left the firm in the meantime have been interviewed in the 2006 survey. New hires are not sampled.
LIAB	Employees covered by social security
REPOSE	Employees in workplaces with 20 employees and more; in private sector excluding agriculture in Metropolitan France. Only employees with a job tenure longer than 15 months are included, excluding temporary workers, trainees and directors.
WERS	Employees who are on the payroll (with a contract of employment at the surveyed establishment). The scope of the WERS 2004 Cross-Section extends to cover all workplaces with 5 or more employees, located in Great Britain (England, Scotland and Wales) and engaged in activities within Sections D (Manufacturing) to O (Other Community, Social and Personal Services) of the Standard Industrial Classification (2003).
WES	All employees working or on paid leave in March in the selected workplaces who receive a Canada Customs and Revenue Agency T-4 Supplementary form.
Linked employee/employer survey, employee section	
AES-CVTS	The persons aged between 15 and 24 having finished initial education or persons aged between 25 and 64 years of age, in enterprises with 10 or more employees
EFE	Individuals between 20 and 49 in workplaces with 20 employees or more employees

2) Minimum size of net sample: at least a thousand employers per country and two or three thousand employees per country

The minimum size of the net sample depends on several criteria:

- The degree to which the sample needs to be representative of particular sub-groups of the population.
- The targets which are pursued in terms of the statistical precision of the main estimates and/or for the analysis of sub-samples.
- The nature of the PSU (employer or employee).
- The sampling procedure (units, degrees, stratification).
- The data collection method (face-to-face or telephone interview, postal survey, etc.) and the resources available for a survey.
- The population covered.

If the first stage sample comprises employers

If the first stage sample comprises employers, the Guidelines suggest that the sample is stratified by sector and size. Stratification improves the precision of all estimates, as it protects against a sample that might severely under-represent particular types of employers because of simple sampling error. To improve the estimation of quantitative indicators such as turnover, performance or employment, one would need to accompany this stratification with variable sampling fractions which over-represent larger units. In each country, it is proposed to include 50 to 100 units per stratum in order to achieve some precision, with two alternative proposals for stratification based on the experience of the surveys we have reviewed:

- 4-5 grouped economic activities level (NACE 17) crossed with 3 to 4 size classes,
- 12 sectors crossed with 4 size classes.

The choice between these two alternatives will depend on the need for aggregated indicators at the European level.

The minimum size of the employee sample will depend on the size of the employer units and the number of employees one wishes to survey in each employing unit. In the existing linked employer/employee surveys that have been reviewed during the preparation of this chapter, the maximum number of interviewed employees per employer ranges from 1 to 25 depending on the size of the employer unit. When only one employee is chosen, the target could be a “core” employee, fulfilling an “essential task” in the company, but this would not lead to a representative sample of all employees. Some surveys choose to target small samples of employees (at least 2) within each employer unit. It can be shown that, if both the employer and employee samples are random, then small samples of employees within each employer unit are sufficient to assess the influence of employee-based measures on employer characteristics (Mairesse and Greenan, 1999). Finally, in order to conduct multilevel analyses, samples of at least 15 employees per employer are needed (Hox, 2002).

Box 6: Minimum size of net samples in European wide establishment surveys

In their European establishment surveys, the EFILWC and the Bilbao Agency for Safety and Health at Work include around 1000 units per country, 500 units for small countries, 1500 for larger countries. EFILWC may increase their sample size in the next editions of their survey.

If employee is the first degree of sampling

If the employee is the primary sampling unit, the employer sample size is not controlled *ex ante*, as it is a result of the employee-level survey. The minimum size of the employee sample will depend both upon the desired size of any sub-samples in terms of age, gender, occupation, etc. in order to achieve sufficient precision in targeted aggregates at the country level, and upon the targeted number of employers to be identified from the answers of the employees. From AES-CVTS and EFE, it can be assessed that interviewing two or three employees (face-to-face) leads on average to one surveyed employer because of non-response and cases in which the same employer is identified by two or more employees. Accordingly, if the aim is survey two to three thousand employees per country, targeting around a thousand employers per country is sufficient to ensure that sub-groups are adequately represented. Box 7 gives the size of net samples per country in the 2005 European Survey on Working Conditions. However, this survey is limited in its capacity to estimate aggregates in sub-samples at the country level. This is why country samples might be replenished in subsequent waves of the survey.

Box 7: Size of net samples in the EWCS

The EWCS 2005 includes 29679 interviews (after quality control). If we break down the sample by country, we find the following numbers: Austria 1009, Luxembourg 600, Belgium 1003, Malta 600, Bulgaria 1134, Netherlands 1025, Cyprus 600 Poland 1000, Czech Republic 1027, Portugal 1000, Denmark 1006, Romania 1053, Estonia 602, Slovakia 1024, Finland 1059, Slovenia 600, France 1083, Spain 1017, Germany 1018, Sweden 1059, Greece 1001, United Kingdom 1058, Hungary 1001, Ireland 1009, Croatia 1011, Italy 1005, Norway 1000, Latvia 1003, Switzerland 1040, Lithuania 1017, Turkey 1015 (EFILWC, 2007).

GUIDELINES:

- A broad population coverage is recommended and a coordination of coverage and sample sizes at the employer and employee levels.
- At the employer level, at least a thousand general managers should be surveyed per country in units with twenty employees or more covering whole countries and the whole economy, including the public sector.
- At the employee level, all employees working at the employer unit should be covered, with a priority given to the representativeness of the weighted sample (no over-sampling, several thousands of workers per country) and no restrictions (except maybe a minimum job tenure if this is necessary because of the constraints imposed by the sampling frame).
- If the employer is surveyed first, between one and twenty five employees per employer should be interviewed (depending upon the size of the units, with a target of two and three per employer on average). If employees are surveyed first, between two and three thousand employees per country should be interviewed to reach the target of one thousand employers per country (depending on country size).

IV.3 Data collection: reasonable flexibility while securing harmonisation

In this section we propose some general principles for the design of survey questionnaires, allowing for some flexibility in order to manage fieldwork costs, whilst at the same time ensuring that data is harmonised across countries. Target response rates and the length of the questionnaires are other important aspects which influence best practice in respect of data collection methods.

1) A core survey plus modules and a uni-mode questionnaire

Cores and modules

The Guidelines recommend the design of a core employer and a core employee questionnaire in which questions are similar across all countries, based on an appropriate translation. These core questionnaires will leave room or time for an additional module that can be developed at a national level according to information needs and context specificity. This implies that the core questionnaires leave room for additional questions arranged in modules. This flexible approach should facilitate harmonisation if the survey is organised through a decentralised approach and it could allow for some variation in the topics covered between different waves.

In a linked survey setting, both the employer and the employee should be informed that the other level is being interviewed. Explicit explanations must be given to employees and employers about how the confidentiality of their responses will be secured. In particular, it should be stressed that the employer will not be informed of the identity and responses of employees. The aim of the survey and of the employer/employee linkage should be clearly explained both to employers and to employees. In particular, em-

ployees are not asked to assess or grade their employer (and vice versa) but to give a 'picture' of how they work (how the organisation performs) on an everyday basis (over a given period of time).

Interviewing employers

Face-to-face interviewing of employers typically yields high response rates and data of good quality, but this method is the most expensive. As the respondent should preferably be the general manager or the person directing the employer unit, interviewers must be qualified. Data collection by telephone is often presented as a cheaper alternative because there are no travel costs. However, there is a tighter constraint on the length of the interview. Postal surveys are not recommended as the sole method of data collection because of the associated low response rates. High response rates (sometimes over 80%) can be achieved from postal surveys in some countries such as France, but in such cases response to the corresponding surveys is typically mandatory and non-responders can be fined.

Table 12: Method for completing questionnaires in employer surveys on organisational change

Face-to-face interview	Telephone interview	Postal questionnaire	Web questionnaire	Follow up by mail or telephone
WERS REPNSE WES MOA	WES NOS NUTEK (1998)	COI NUTEK DISKO NOS TNO/WIS	PASO	DISKO PASO COI TNO/WIS

In addition to these elements, the choice for completing questionnaires may also depend upon the linkage between the employer-level and the employee-level survey. As the response at the second stage of sampling is conditional upon the response at the first stage, in a linked employer/employee survey it is preferable to conduct face-to-face interviews at the employer-level.

In view of the previous elements, and in order to maximise the cost-quality trade off, another option for the employer survey is to combine several data collection methods (Box 8). For instance, face-to-face or telephone interviews can be complemented with postal questionnaires collected in advance or afterwards on topics for which information is more difficult to gather instantly (for example on productivity, sick leave, number of employees per category). Another possibility is to ask the respondent to choose between the available methods: postal, telephone, face-to-face, web based or a combination, with the risk of generating specific patterns of response connected with the data collection method.

Box 9: An example from WERS 2004 of a combined method for data gathering

As part of the WERS 2004 survey, a four page self-completion questionnaire on financial performance was left with the respondent at the end of the face-to-face interview. It was to be completed either by the respondent, or by another manager who was better able to report on financial matters. The questionnaire was placed in 2,076 workplaces and 1,070 questionnaires were returned (a response rate of 51%) (Forth and McNabb, 2007). The overall yield among the 2,295 workplaces taking part in the WERS 2004 cross-section (that is, including those who refused to accept the questionnaire) was 49%.

Three important stages should be distinguished in the process of data collection at the employer level: first, reaching the right person; second, collecting the answers to the questionnaires, including collecting figures; and third, complementing the data collected in the field with information from other available data sources like registers.

Interviewing employees

The issues in respect of data collection methods are to some extent different for employees, as here it is particularly important to ensure confidentiality. Contacting an employee at work requires the agreement of the employer (Box 9), which can introduce biases because it is more difficult to maintain confidentiality. The employee can also practice self-censorship either by refusing to respond or by not giving authentic responses.

Box 8: Reaching the employee through the employer in WERS

Regarding the conduct of the WERS Survey of Employees, in workplaces where managers permitted the survey to take place, the interviewer conducting the management interview obtained a list (from the employer) of all employees at the establishment who were on the payroll at that time. The interviewer selected 25 employees at random from this list and left a named questionnaire for each selected employee, to be distributed by the manager. In workplaces with between 5 and 25 employees, a named questionnaire was left for each employee. Each questionnaire was to be placed in a sealed envelop upon completion. The completed questionnaires were either posted directly to the fieldwork office by the respondent, or collected at the workplace and returned in a single batch to the interviewer or by post.

To an even greater extent than in the case of employers, the choice of the data collection method for employees depends upon the way in which the two steps of the survey are combined (Box 10 and Table 13). If employers are sampled first, the easiest option is either to: distribute employees questionnaires at work (to the home addresses for those who are on holidays, sick leave), and for these questionnaires to be returned by postal mail; or to interview employees either directly at work when they can (or later) or to do so by phone or face-to-face at home. If employees are sampled and interviewed first, one would prefer either face-to-face or telephone interviews, in order to collect good-quality contact information which can be used to identify the employer in the second stage of the survey.

Box 10: Possibilities for approaching employees tested in developing the WES

In the pilot survey of 1996, employers forwarded an information slip on to their employees and the employees were asked to contact Statistics Canada so that a telephone survey could be conducted. This resulted into a 55% response rate. Other approaches also have been tested in the development of the WES. In another case, workers were asked to complete a small questionnaire (of about five questions) and were asked to return it to Statistics Canada, along with their personal phone number. They were then contacted and a longer telephone interview was conducted. Asking for workers active participation through the completion of a small survey raised response rates to a 70% rate. Employers have also been asked to provide the employees' work telephone number. In this case interviewers from Statistics Canada could actively head for an interview, rather than passively wait for potential respondents to contact them. Also, the possibility has been considered that the interviewer speaks to the employees at the establishment to obtain his consent and telephone number. Taken together, these approaches brought the worker response rates to the high level of about 80%, matching that of the workplaces (Krebs et al., 1999).

Table 13: Method for completing questionnaires in employee surveys on organisational change

Employee identified through the employer and interviewed			Employee identified in a register and interviewed at home		
At work		At home by post or web	Face-to-face	Telephone	Postal or Web
Post or web	Face to face or telephone				
WERS	WES	WES	BSK COI EWCS via a random walk procedure	COI	NWCS OSA Ee REPOSE

The uni-mode strategy

A uni-mode questionnaire, in which questions are designed to be suitable for administration in all possible modes, is an interesting strategy at both levels because it provides some further flexibility in cases where the available national survey infrastructure may place some limits on the way in which questionnaires are administered. The development of a uni-mode questionnaire implies a focus on the mode which has the strongest constraints, possibly telephone, where the maximum length of the interview is shorter than in the case of a face-to-face interview and where visual aids (such as showcards) and shortcuts (such as matrix questions) have to be avoided.

2) Questionnaires of reasonable length: 30 minutes if uni-mode

The experience from surveys on the dynamics of organisations and work shows that this topic is rather well accepted both by employers and by employees. While questionnaires in this field generally cover a fairly wide range of topics, the surveys have not proved to be overly burdensome for respondents if the majority of the questions require only 'yes or no' answers or use Likert answer scales. In the following discussion, we indicate the maximum length of any core questionnaire plus modules.

From the large set of employer surveys under review, we can identify the variety of practices as well as the average or modal situation. Of course, the maximum length of the questionnaire depends upon the way in which the questionnaire will be administered.

- If postal: **around 10 pages**

Range: from 4 to 16 pages (200 questions)

- If by telephone: **around half an hour**

Range: from 15 minutes to 45 minutes

- If face-to-face: **around an hour**

Range: from 10 minutes to 100 minutes

The interview with the employer will be longer if the interviewed person is asked to supply a list of employees or to sample employees, a task which can also be delegated to a subordinate.

WERS is an interesting case (Box 11) because even though the survey represents a substantial burden for the respondents, response rates remain quite high. This is thought to be due to the official nature of the survey, the extensive finances and time committed to fieldwork and the acquired reputation built on widespread communication of the results to a large community.

Box 11: Employer questionnaires in WERS 2004

The 2004 employer Cross-section Survey contained the following five components:

Self-completion questionnaire for the main management respondent about the composition of the workforce (four pages)

Face-to-face interview with a main management respondent (average two hours)

Face-to-face interview with union and non-union employee representatives, where present (average 45 minutes)

Self-completion questionnaire distributed to a random selection of up to 25 employees in the workplace (eight pages)

Self-completion questionnaire for the financial manager about the financial performance of the establishment (four pages)

The time needed to answer questionnaires should not be longer for employees than for employers, as it requires the prior agreement of the employer if the survey takes place at work, and it engages the leisure time of the employee if the survey takes place at home. The length of questionnaires should range between **30 minutes to one hour** when the interview is face-to-face, but could be **30 minutes on average** when the interview takes place by telephone or postal/web-based mode.

In a uni-mode questionnaire setting, the reasonable length is 30 minutes, as in a telephone survey, both for employers and for employees.

Given the size of the core employer and employee questionnaires, the maximum size of a module would be around 10 minutes. Depending upon the mode of administration and to the general practice in each country, it could prove necessary to accommodate these modules either by a switch to face to face interviewing or through the deletion of some questions in the core questionnaire.

3) Secure a good response rate: an aim of 60% for most countries

For both employer and employee, the highest response rate is targeted, but response rates depend on the data collection method used, on the institutional setting at the national level and more generally on the resources devoted to data collection. Response rates in the surveys under review for this chapter vary from 12% to 85%. Box 13 gives the range of country response rates in two European surveys conducted by EFILWC.

Box 12: Response rates in European cross-national surveys

We can take the examples of two recent surveys conducted by the EFILWC: an employer-level survey, the ESWT and an employee-level survey, the EWCS. Both were conducted by means of face-to-face interviews. Response rates ranged from 11% (Hungary) to 61% (Poland) in the ESWT and from 28% (the Netherlands) to 69% (Czech Republic) in the EWCS 2005 (EFILWC, 2007). Regarding the relatively low response rate in the Netherlands, the postal/web-based employee surveys NWCS 2007 and 2008 and the OSA labour supply panel 2006 show response rates of 33%, 31% and 20% respectively, although some financial bonus was provided for completing the questionnaire.

However, the Guidelines recommend a target rate of 60% to be met in most covered countries. This target is important to assure the quality of cross-national comparisons. More precisely, across countries, the methods used to complete the questionnaire should be as similar as possible, as should response rates and these should reach a high level. However, in case these thresholds are not reachable in some countries, one should plan to undertake an assessment of bias in every country, which allows for the comparison of respondents and non respondents on key survey variables as suggested by Sturgis et al. (2006) in the context of the PISA survey. This bias assessment could be used to make weighing adjustments.

As a result, particular attention should be given to reducing non-response, to analysing non-response biases and to weighting procedures. It can be noted that a linked survey brings additional possibilities in these regards: in the employee/employer variant, employer non-response analysis can call upon information given by their employees; in the employer/employee variant, employee non-response bias can be assessed using responses given by their employers.

More generally, it seems to be the case that officially-supported surveys get considerably higher response rates than academic surveys. There may be a number of reasons for this; for example, advance letters appear more authoritative and the survey seems more legitimate and worthy. Thus, official bodies in relevant countries (national statistical offices or central government departments) should be brought into the design of the survey as designated supporters.

GUIDELINE:

A flexible approach to data collection methods is recommended in order to master costs, while securing harmonisation. The employer and employee surveys should consist of a core questionnaire and modules which can be further developed at the national level. The questionnaires should be designed according to a uni-mode principle, making them suitable for any mode of administration. This implies lining up with the constraints of telephone surveys, which are the most stringent and imply in particular a maximum length of thirty minutes. A target response rate of 60% should also be aimed for.

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Appendix: List of reference surveys

Acronym	Name of the survey	Last wave	Country	Producer/sponsor
AES – CVTS linked employee/ employer	Adult Education Survey – Continuing Vocational Training Survey	2006	France	Céreq, Eurostat, INSEE, DARES
BSS employee BSS/EPS linked employee/ employer in 2001/2002	British Skills Survey (Employer Perspectives Survey in 2002)	2006	United Kingdom	University of Kent/ Economic and Social Research Centre (ESRC) on Skills, Knowledge and Organisational Performance (SKOPE)/ Department for Education and Skills/Department for Trade and Industry/the Learning and Skills Council/the Sector Skills Development Agency/ Scottish Enterprise; Futureskills Wales/ Department for Education, Lifelong Learning and Skills, Welsh Assembly Government/Highlands and Islands Enterprise/ East Midlands Development Agency/ Department for Employment and Learning, Northern Ireland
CIS employer	Community Innovation Survey	2005	EU-27, Iceland, Norway	Eurostat
COI linked employer/ employee	Changements Organisationnels et Informatisation	2006	France	Statistique publique INSEE- DARES-DREES-DGAFFP-CEE
DISKO employer	Danish Innovation System: Comparative analysis	2006	Denmark	Aalborg University -Denmark Statistics
ECS employer	European Company Survey	2009	EU27 + Croatia, Turkey and Former Yugoslav Republic of Macedonia (FYROM).	European Foundation for the Improvement of Living and Working Conditions

EFE linked employee/ employer	Enquête famille employeurs	2005	France	Institut National des Etudes Démographiques
EMS employer	European Manufacturing Survey	2006	Germany, Austria, Croatia, France, Great Britain, Italy, Slovenia, Turkey, Greece, Netherlands, Spain	Coordinator: Fraunhofer Institute of Systems and Innovation Research (ISI)
ESES linked employer/ employee	European Union Structure of Earnings Survey	2006	EU-27 + Iceland and Norway	Eurostat
ESS persons over 15 years old in private households	European Social Survey	2006/ 2007	32 countries, including 22 EU countries	Coordinator: City university, UK University of Leuven, Belgium / NSD, Norway / ZUMA, Germany / ESADE, Spain / SCP, Netherlands Sponsored by the European Commission and the European Science Foundation
ESWT employer	Establishment Survey on Working Time and Work-Life Balance	2005	EU-15, Czech Republic, Cyprus, Hungary, Latvia, Poland, Slovenia	European Foundation for the Improvement of Living and Working Conditions
EWCS employees	European Working Conditions Survey	2005	EU-27 + Croatia, Turkey, Switzerland and Norway	European Foundation for the Improvement of Living and Working Conditions (EFILWC)

LIAB linked employer/ employee	Institut für Arbeits- und Berufsforschung	2007	Germany	Institut für Arbeitsmarkt- und Berufsforschung der Bundesanstalt für Arbeit
MOA linked employer/ employee	The MOA method for assessment of organisations The MOA questionnaire on changed working conditions	2006	Sweden	National Institute for Working Life
NOS linked employee/ employer	National Organization Study	2002	United States	National Opinion Research Center funded by the National Science Foundation, the National Institute of Occupational Safety and Health and the Commonwealth Fund.
NUTEK employers	Technological and Organisa- tional Change and Labour Demand: Flexible Enterprises - Human Resource Implications	1998	Sweden	Swedish National Board for Industrial and Technical Development, Department of Structural Analysis
NWCS employees	Netherlands Working Conditions Survey (NEA: Nationale Enquête Arbeids-oms- tandigheden)	2007	The Netherlands	TNO Work and Employment; Ministry of Social Affairs and Employment (SZW); Statistics Netherlands (CBS)
OSA Er employers	OSA Labour demand panel (Arbeidsvraag- panel)	2005	The Netherlands	OSA Institute for Labour Studies; Ministries of: Social Affairs and Employment; Economic Affairs; Internal affairs and Kingdom Relations; Education, culture and science; Health, welfare, and sport

OSA Ee employees	OSA Labour supply panel (Arbeidsaanbodpanel)	2007	The Netherlands	Idem
PASO employer	Panel Survey of Organisations	2004	Flanders	VIONA – Steunpunt OOI – ESF Vlaanderen
REPONSE linked employee/ employer	Relations professionnelles et négociations d'entreprise	2004	France	DARES
TNO/WIS linked employee/ employer	TNO Work in the Information Society survey	2002	The Netherlands	TNO Work and Employment; Ministry of Social Affairs and Employment (SZW)
WES linked employee/ employer	Workplace and Employee Survey	Employees: 2005 Employers: 2006	Canada	Statistics Canada
WERS linked employee/ employer	Workplace Employment Relations Survey	2004	Great Britain	Department of Trade and Industry (DTI) Advisory, Conciliation and Arbitration Service (Acas) Economic and Social Research Council (ESRC) Policy Studies Institute (PSI)

Chapter III

Measuring the dynamics of organisations and work : employer- level survey

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I. Introduction

This chapter proposes indicators and a questionnaire for measuring organisations and organisational change at the employer-level. The chapter further develops the concepts presented in Chapter I and takes into account the elements of the general survey framework presented in Chapter II. It is complementary to Chapter IV which proposes indicators and a questionnaire for the employee-level survey.

Focus of the employer level survey

The MEADOW Guidelines consider a survey that links the interview of an employer with the interviews of his or her employees as the richest survey setting for measuring organisational change and its social and economic impacts. As discussed in Chapter I, there are a number of reasons for this recommendation. A linked survey can enrich information derived from one level with information from the other. For example, employer-level information provides useful contextualisation to the description of work provided by employees, whilst employee-level information can be used to compute indicators at the employer-level on topics that cannot be easily observed by an employer, such as the degree of work-related stress or the nature of intrinsic rewards. A closely related motive for using linked surveys is that people in various positions may view the organisation and how it has changed very differently. For example, earlier research has shown that perceptions of the impact of organisational change are very different depending on who the informant is (Härenstam et al., 2006; Härenstam, 2007; Worall and Cooper, 2003). When exploring what is meant by organisational change, employees often refer to negative aspects, such as downsizing, while managers tend to refer to organisational development and investments in new technology.

Organisational surveys at the employer-level can provide information on how organisations use policies, apply management practices and organise work, as well as how they approach and cope with change. Questionnaires may be addressed either to the workplace-level or to the company or enterprise-level. As discussed in Chapter II, there are advantages and drawbacks to each level in terms of the quality of the information collected. The Guidelines recommend the workplace when there is no linked employer/employee register available because it is easier to draw up lists of employees at the workplace level. But when a linked register is available, as is the case in some EU nations, arguments in favour of the workplace or the company level are more balanced. As stated in chapter II, the best of both worlds could be sought implying a flexible view on the employer sampling unit, as long as the same primary sampling unit is applied across Europe.

Structure of the chapter

The following sections of this chapter are structured according to the measurement framework presented in Figure 1 of Chapter I. The core concepts introduced in Chapter I are further developed into definitions which form the basis for identifying indicators for measuring organisational forms and organisational change. Many of the indicators are relevant to multiple concepts reflecting the basic interconnectedness of different parts

of the organisation. Capturing the initiation of change, the momentum carrying it throughout the organisation, and its effects is an ambitious goal. Much of what intersects or overlaps points to a need for greater *flexibility* in organisations, and *flexibility* is a key underlying theme in the way organisations are structured and in the changes they introduce. In section II, core concepts are developed and relevant indicators are proposed. Section III provides a discussion of the key background establishment characteristics which need to be measured to set the scene where organisational dynamics take place. The employer questionnaire is included as an appendix to the chapter.

II. Concepts and indicators

The MEADOW employer survey is designed to cover the topics identified in the measurement frame developed in chapter I. The following seven concepts are included in the indicators to be described in sections II.1 through II.7: drivers of organisational change, management techniques and practices including the use of ICT, organisational structure and the organisation of work, types of organisational designs, employment relations, and outcomes of organisational states and change in terms of social and economic performance.

Box 1: Structure of the employer survey questionnaire

Employer survey questionnaire sections		Chapter III sections
Section A	Demographics and workforce characteristics	II.4, II.5, II.6, III
Section B	Organisational structure and change	II.1
Sub-section 1)	Work organisation	II.2, II.3, II.4
Sub-section 2)	Management practices	II.2, II.3, II.4
Sub-section 3)	Use of ICTs	II.1, II.2
Sub-section 4)	Outsourcing and collaboration	II.3
Section C	Human resources	II.4, II.5
Section D	Economic context and strategic objectives	II.1, II.6
Section E	Establishment	II.6

These concepts and indicators are developed into questions in the employer survey questionnaire, which is included as an appendix to the chapter. Box 1 presents the general structure of the questionnaire. Sections A through E of the questionnaire reflect

concepts developed in sections II.1 through II.6. In the following, boxes will provide lists of indicators associated with each concept and the acronyms of the corresponding questions which start with the section letter. For example, questions from the section on organisational structure and change will start with a B. Of course, some questions can be related to different concepts. They will only appear in one section of the questionnaire, but they can be referred to in different boxes.

The MEADOW Guidelines propose an economy-wide approach developing indicators applicable to both public and private sector organisations and to all groups in the labour force. One consequence of this is that some organisational features specific to public sector organisations are not addressed through the development of appropriate indicators. Section II.7 identifies organisational features specific to public sector organisations that could be measured through the use of a specialised module.

As far as gender issues are concerned, indicators in the employer questionnaire are limited to identifying the proportion of women in the workforce and to the proportion of managers that are women. This provides a basis for measuring differences in the use of management practices, forms of work organisation, types of coordination mechanisms and authority relations according to the importance of women in the workforce. Further, these measures provide a basis for collecting information on the gender composition of the workforce that is stratified according to such factors as sector, occupation and establishment size. However, this approach is inadequate for capturing many key aspects of gender in organisations. In particular, power relations between men and women and gendering processes are both central in gender theory and relevant to empirical studies of organisational change. While special purpose survey modules could be developed to address these issues, they arguably are inadequate and should be complemented by other empirical methodologies including qualitative case study approaches that can be designed so to facilitate the discovery of gender-relevant structures and processes in the organisation.

II.1 Drivers of organisational structure and change

The umbrella terms ‘globalisation’ and ‘internationalisation’ are often used to characterise fundamental changes which have taken place in the spatial distribution of economic activities and there is an extensive literature on how firms have been affected by the rise of global markets, global production and knowledge flows, and global streams of finance.

Other important drivers of organisational change are the general dynamics of the economy resulting in economic downturns or booms. While organisations have to cope with fast growth processes involving the development of new markets and growth in the number of employees during periods of boom, they also need to be able to flexibly react to economic crises accompanied by decreasing demand, difficulties in raising capital or increased competitive pressure.

Enterprises are embedded in wider social and political systems and government policies and regulations in such areas as education, health and safety, the environment, and labour markets will affect organisational change. Organisational design and decision-making will also be affected by pressures associated with citizens’ changing demands regarding work-life balance or access to training and education.

While wider economic and institutional changes form an essential backdrop to accounting for organisational change, employer-level surveys are poorly placed to provide measures of them, except as they are perceived by respondents. The MEADOW employer survey focuses mainly on capturing employers’ perceptions of how changes in market conditions and technology have impacted on their operations. Box 2 gives the proposed indicators for drivers of organisational structure and change and their links with the employer survey questions.

Box 2: Indicators for drivers of organisational structure and change

Indicators	Survey questions
Globalisation	DMRKT, DMRKTPUB
Economic and market pressure	DMRKTCHNG, DMRKTCHNGPUB
Technological change	DOPCHNG, B3ITUSE
Government policies and regulations: norms and regulations	DOPCHNG

II.2 Management techniques and organisational practices

Collecting and analysing data on management practices and techniques have several advantages for studying change and innovation in organisations. When a manager implements a new practice based on a management concept, he or she has the intention of changing the organisation and the implementation itself is a measure of organisational change. However, these questions have a high obsolescence rate (Abrahamson and Fairchild, 1999) and this may require some replacement of questions on successive waves of an employer-questionnaire. Moreover, questions on managerial practices are somewhat blurred since in implementing new managerial concepts managers interpret and adapt them to the local context. For instance, quality circles and business process reengineering may take on different meanings across firms and over time. Some management concepts may lead to techniques or practices with slightly different names at a later date. In the MEADOW survey, design problems linked to ambiguity in the meaning attached to labels are handled by using questions which describe the practice rather than simply naming it. From one survey wave to the other, some fieldwork and the analysis of the management literature could also prove useful for identifying new management concepts and their translation into emerging management practices and techniques. For instance, the use of the Internet by employers was emerging in the early 1990, but by the beginning of the new millennium it had become a standard, with the implication that information about the employer’s use of the Internet was no longer useful for discriminating workplaces according to their use of ICTs. Such phenomenon

creates a need for the renewal over time of indicators about management techniques and organisational practices.

As discussed in Chapter I, since the mid-80s there have been large reforms in how the public sector is managed in all the countries of OECD. Part of these reforms have been named New Public Management (NPM) (Hood 1991). During the 1990s the reforms focused mainly on marketisation of the public sector, but in the 2000s there has been an increasing focus on internal governance within state, municipal and county organisations. According to Pollitt (2003) NPM of the third millennium is characterised by the following :

- A shift in focus from administrative systems, resources and processes to outputs and impacts
- Increased importance of performance measurements
- Contracts and contract-like relationships between the levels of purchasers and providers
- Increased use of market-like mechanisms in various forms of service production.
- Emphasis on quality and customers' views

The emphasis on performance, output measures and quality implies a certain convergence in the objectives of management practices across private and public sector organisations and this trans-organisational feature underlies the MEADOW choice of a common survey questionnaire for both public and private organisations. Some relevant features of public sector organisations may not be adequately captured in this manner and they could be the focus of a separate module as discussed in Section II.7 below.

The Guidelines focus on the management techniques and organisational practices identified in chapter I because they contribute to strategies for greater organisational flexibility and innovativeness: Total Quality Management, lean production, ICTs and Knowledge Management.

1) Total Quality Management

Total Quality Management (TQM) emphasises the importance of involving all the organisation's employees in processes of quality control and improvement. Each step or job process is seen as an opportunity to eliminate error or waste, and to improve the output of the organisation (Morgan and Murgatroyd, 1994). The core of TQM is the customer-supplier interface, both internally and externally. At each interface there are processes which convert inputs to outputs. There is a focus on the internal details of work processes, and on assuring that all quality-related decisions are based on quantitative measures and not on subjective impressions.

The MEADOW Guidelines propose indicators for measuring quality monitoring, quality-related problem-solving and customer satisfaction monitoring (Box 3). Questions are designed to describe these processes rather than using labels in order to minimise problems of obsolescence or ambiguity associated with differences in the meanings attributed to organisational labels across nations and over time.

2) Lean production techniques

Lean production may be defined in different ways. Womack and Jones (2003, p. 10), who initiated the lean wave, define lean principles as being designed to, "precisely specify value by specific product, identify the value stream for each product, make value flow without interruptions, let the customer pull value from the producer, and pursue perfection." MEADOW proposes a single indicator to capture the organisation's use of systems to minimise inventories, supplies, or work-in-progress. As Kochan *et al.* (1997) have observed, the effective use of lean methods is connected to wider changes in work organisation and employee relations, including greater organisational flexibility, employee participation, investment in skill development, and reductions in employment security associated with downsizing. The MEADOW employer survey included questions which can be used to capture this broader understanding of lean production.

3) Information and Communication Technologies

The harmonisation of ICT indicators has been a major policy issue. On March 2007, the UN statistical Commission endorsed the core list of indicators on information and communication technologies (ICT) which was developed by the UNCTAD (United Nations Conference on Trade and Development) XI Partnership on Measuring ICT for Development. The UNCTAD questionnaire for enterprises uses a basic and an extended core of indicators. With only slight modification, almost all the indicators can be adapted for use at the establishment level. This has already been done in the METI ICT Workplace Survey in Japan¹.

Europe's information society policies are based on a harmonisation of ICT indicators for EU-member nations. Key policy objectives include the completion of a 'Single European Information Space' which promotes an open and competitive internal market for electronic communications, media and content, and the strengthening of innovation and investment in ICT research to promote growth and jobs through a wider adoption of ICT. The i2010 benchmarking strategy aims to monitor progress in achieving these objectives on the basis of indicators covering 22 different areas of ICT adoption and use including broadband take-up, the availability and use of on-line services, ICT adoption within businesses and households, e-business, e-government, and macro indicators of growth and employment in the ICT sector².

The OECD's Directorate for Science, Technology and Industry has adopted a similar approach proposing 15 key indicators divided between specialised ICT survey based measures of ICT use by households, ICT penetration in business and e-commerce, and aggregate measures based on national accounts measuring R&D in the ICT sector and ICT's share of national employment and trade³.

¹ United Nations Report : CES/SEM.52/CRP.1 p. 4.

² See : i2010 High-level Group, The i2010 Benchmarking Framework, European Commission, 2006.

³ See : OECD, "Information Technology Outlook", 2008.

The MEADOW employer-survey aims to capture ICT as an integral component of new business practices or in cases where ICT facilitates organisational change. ICTs then take the status of tools among others that are adopted by employers with the intention of changing the way the organisation operates. As discussed in Chapter I, the empirical literature on organisational complementarities shows that the impact of ICT on performance is not guaranteed, but depends on complementary investments in skills and on the use of specific organisational practices. Existing EU surveys focus on the diffusion of ICT and on e-commerce but they do not open the black box of ICTs to identify different uses in relation to managerial practices and forms of work organisation. The proposed MEADOW indicators of ICT provide a basis for exploring these complementarities in the organisation.

The MEADOW Guidelines propose two general questions to be included in the core questionnaire on the provision of on-lines services as a measure of e-commerce and on the percentage of the workforce that use computers as part of their normal work duties as a measure of ICT skills. The Guidelines propose a series of questions on the use of specialised forms of software to be included as a separate module and not be included in the core questionnaire except in cases where the ICT manager is the main respondent. This recommendation is based on the results of cognitive testing which showed a high level of non-response for questions on the use of specialised ICT software for such activities as workflow or collaborative work (See the appendix on the synthesis of cognitive testing). Section II.7 discusses further ICT related issues that could be addressed in an extended ICT module.

4) Knowledge Management

There is considerable policy interest in the competitive advantages that knowledge may provide for organisations and in the significance of knowledge workers, organisational competencies and knowledge-intensive firms. Knowledge Management (KM) is seen as a core dimension in bringing about organisational change. KM is a method for getting control over an important non-material resource of the organisation – the knowledge of employees – through collecting and systemising this knowledge in order to make it transparent and available for the organisation, including to other employees. The MEADOW employer-survey includes a question focusing on the benchmarking and diffusion of good working practices within the organisation, and a question pertaining to the monitoring of external knowledge on technical developments which also serves as an indicator of the development of a learning organisation (see section II.4 below).

Box 3: Indicators for management techniques and organisational practices

	Indicators	Survey question
Total Quality Management	Customer satisfaction is continuously monitored	B2CUSAT
	Quality circles	B1CIRCLE, BCIRCLEPER
	Quality monitoring	B1DLGQLT, B2QUAL
Lean production	System to minimise inventories	B2JITP
ICT	Advanced on line services	B3IWEB, B3WEBSERV
	Client or customer relationship software	B3ITUSEa
	Performance tracking software	B3ITUSEb
	Enterprise Resource Planning software	IB3ITUSEc
	Collaborative work software	B3ITUSEd
	ICT skills	B3EMPL
Knowledge Management	Data bases documenting good work practices	B2KMDBASE
	Monitor external ideas and technical developments	B2KMEX

Up to now, questions about the use of a set of management techniques and organisational practices at the date of the survey have been presented. As discussed in chapter II, the Guidelines recommend measuring change through the identification of states at two different points in time: the date of the survey and the same date two years before, captured with a retrospective question. Most of the variables on management techniques and organisational practices follow this guideline (Box 4). Retrospective questions are only asked to employer representatives belonging to establishments with at least two years of existence. Because of its multi-item structure, the question on who is responsible for quality control is an exception (B1DLGQLT). The question on quality circles goes further in the measurement of change as an additional question is asked about the evolution of the percentage of employees participating in such groups (B1CIRCLCHG). This complements the information about the percentage of employees participating at the date of the survey (BCIRCLEPER).

Box 4: Indicators of changes in management techniques and organisational practices

	Indicators	Survey question
Total Quality Management	Customer satisfaction is continuously monitored	B2CUSAT2007
	Quality circles	B1CIRCLE2007, B1CIRCLCHG
	Quality monitoring	B2QUAL2007
Lean production	System to minimise inventories	B2JITP2007
ICT	Advanced on line services	B3WEBSERV2007
	Client or customer relationship software	B3ITUSE2007a
	Performance tracking software	B3ITUSE2007b
	Enterprise Resource Planning software	IB3ITUSE2007c
	Collaborative work software	B3USEd
	ICT skills	B3EMPL
Knowledge Management	Data bases documenting good work practices	B2KMBASE2007
	Monitor external ideas and technical developments	B2KMEX2007

II.3 Organisational structure and work organisation

The way organisations are designed is crucial in understanding both organisational performance and employee outcomes. The concept of organisational design refers both to work organisation and organisational structure: how work is divided into job tasks, bundling of tasks into jobs and assignments, interdependencies between workers in job performance, and how work is coordinated and controlled in order to fulfil the goals of the organisation. Organisational structure also includes considerations of the international division of labour, where production process may be divided between companies, regions and nations by increased use of subcontracting and outsourcing as well as by various forms of partnership and alliance.

In much of the recent literature the organisation, rather than being described in terms of its structure, is characterised in terms of systems of managerial practices. Typical terms for describing the organisation include 'the flexible organisation', 'high performance work systems' and 'learning organisations'. However, it is possible to describe such organisational systems and the direction of their change in terms of the traditional organisational dimensions of the division of labour, authority relations and control strategies (Robbins and Barnwell, 2002; Child, 2005; Mintzberg, 1983). These three dimensions are treated as core concepts in developing indicators for organisational structure and work organisation.

1) Division of labour

The division of labour concerns the division of work activities into specialised units, as well as the specification of roles in the organisation (Pugh et al., 1968; Robbins and Barnwell, 2002). The division of labour can range from highly specialised to highly integrated. The horizontal division of labour refers mainly to job specialisation or to the extent to which jobs are split into small, repetitive tasks, thereby decreasing the number of tasks included in a role (Mintzberg, 1983). Lesser degrees of horizontal specialisation are accomplished by integrating work tasks in flows or processes and assigning them to teams, or individuals working in projects. Multi-skilled employees then replace the specialised worker by so called functional flexibility (Atkinson, 1984). The vertical specialisation of work refers to the extent to which the responsibility for planning and follow-up of work is separated from the job performance. High levels of vertical specialisation lead to deskilling of the workers. In such contexts jobs tend to be highly specialised and skills narrow (Braverman, 1974; Thompson, 1984).

The new international division of labour resulting in a broader division of labour between companies and nations has been the focus of much literature over the last decades (Ackroyd, 2005). This process results in increased specialisation of activities by organisations and in greater interdependencies among them. Some research has pointed to larger organisations being deconstructed into smaller business units/firms through subsidiarisation, franchising, sub-contracting and forms of alliances (Ackroyd, 2005; Giertz, 2000). In this respect, the business function approach is promising (Sturgeon, 2008; Huws et alii, 2009). In a globalised economy, firms reorganise business functions through outsourcing and offshoring in an effort to provide the right mix of intermediate goods and services to larger networks of firms.

Employer surveys can provide a variety of information on the division of labour and notably are suited for capturing the use of subcontracting, outsourcing and alliances for different types of business functions. Employer surveys can provide some information on the internal division of labour through questions on the use of such practices as multi-skilling or autonomous team organisation and questions on the relations of control between different departments or divisions of the organisation. Detailed information on the degree of specialisation and repetitiveness of tasks is best collected at the employee level.

2) Authority

Authority refers to the structure of decision-making in the organisation: whether decision-making is centralised (i.e. concentrated and executed by top management) or decentralised (i.e. executed by the employees performing the actual job) (Robbins and Barnwell, 2002). Decentralisation can also be achieved by delegating authority to teams, groups or projects. From an inter-organisational perspective authority relations are particularly difficult to study. It may be difficult to determine where the most decisive power is executed in a context where transnational agencies and large multinational companies operate all over the world (see e.g. Ackroyd, 2005). Conflicting trends may be observed, where the flattening of the hierarchy at the local unit level is combined with increased hierarchy and centralisation at the inter-organisational and international levels (Alvesson and Thompson, p 500, 2005).

The MEADOW employer-survey develops basic measures on the nature of authority relations within the organisation by asking questions on whether it is the organisation's policy to delegate responsibility for specific types of tasks or operations to the employee involved. Detailed information on the extent to which an employee exercises control over such features as work pace and task order are best collected at the employee level.

3) Coordination and control

As work is divided vertically and horizontally it has to be coordinated and controlled. Mintzberg has identified five coordination mechanisms: direct supervision, standardisation of work, standardisation of outputs, standardisation of skills, and mutual adjustment (Mintzberg 1979). One main characteristic of an organisation is how these mechanisms are combined and exercised. Control aims at ensuring that a predictable level and type of outcome (performance) is accomplished and maintained (Child, 2005, p.112). Control by means of formalised rules and standardisation is one strategy (Pugh and Hickson, 1993). Another strategy is control by 'soft' systems which refer to more qualitative methods, such as internalisation of norms and values by dialogue, employee discretion, motivation and creativity (Child, 2005; Maravelias, 2002; Peterson, 2005).

A considerable body of research identifies trends towards the functional decentralisation of managerial structures (Alvesson and Thompson, 2005, p 489). The increased use of project teams and other forms of self-governance goes hand-in-hand with relatively decentralised systems of horizontal coordination. However, this type of decentralisation can be combined with centralised forms of control, such as the use of quantitative norms regulating work pace or standardisation of tasks imposed though the use of specific forms of ICT for regulating work flows. Consequently, it is important to measure both centralised forms of control and non or post-bureaucratic forms.

There appear to be both similarities and differences in the management of public organisations compared to private firms. Organisations in public sector are exposed to a transformation pressure emanating from the political system aiming for more efficiency in serving the needs of citizens, customers and clients at low costs and, as noted above, this results in some overlap with the management practices applied in the private sector. However, the public sector has a tendency towards more 'administrative orthodoxy' than in the private sector, believing that sound management requires strict accounting and control. Transparency laws are seen as means of increasing public trust in government and the optimistic view is that they will produce a culture of openness (Hood and Heald, 2006). Such issues might be addressed in a separate module as discussed in Section II.7 below.

Box 5: Indicators for organisational structure and work organisation

Indicators		Survey question
Internal division of labour	Multi-skilling	B2CUSAT2007
	Autonomous teams	B1CIRCLE2007, B1CIRCLCHG
	Vertical specialisation	B2QUAL2007
	Horizontal specialisation	B2JITP2007
External division of labour	Alliances and inter-firm collaboration	B3WEBSERV2007
	Subcontracting/outsourcing	B3ITUSE2007a
Authority	Centralisation and decentralisation of authority	B3ITUSE2007b
	Individual responsibility for performance	IB3ITUSE2007c
Coordination and control	Monitoring through management practices	B3USEd
	ICT monitoring	B3EMPL

As far as organisational structure and work organisation are concerned, changes are captured using retrospective questions for most of the indicators given in Box 5. Exceptions are the variables on horizontal specialisation (B1DIVTYPE, B1NDIV, B4ACTV) and the variable on decentralisation of decisions about planning and execution of daily work tasks (B1STRUC). The multi-item structure of these questions makes the formulation of retrospective questions more difficult in a unimode questionnaire. The question on time discretion for non-managerial employees (B1DLGSCHD) goes further in the measurement of change as an additional question is asked about the evolution of the percentage of non-managerial employees concerned (B1DLGSCHDCH). This question complements the information about the percentage of employees exercising time discretion at the date of the survey (B1DLGSCHDPER).

Two synthetic questions on change are included in section E of the questionnaire: EINNOVORG and EBASKET. EINNOVORG defines an organisational innovation, even though it uses the term 'change' instead of the term 'innovation'. 'Change' is used because the term innovation is not defined in the questionnaire and the word 'innovation' is used only once (Question AEMPCH-CAUSE in reference to the causes of a decline in employment). EINNOVORG prompts the respondent to think about the issue of organisational change and provide a relevant reply in EBASKET which is a synthetic open-ended question that collects the views of the respondent about the most important organisational change that has marked the life of the establishment over the previous two years. It is formulated as follows: "Could you please describe the most important organisational change introduced to your establishment over the past two years". The description is recorded verbatim.

Box 6: Indicators changes in organisational structure and work organisation

Indicators		Survey question
Internal division of labour	Multi-skilling	B1MULTSK2007
	Autonomous teams	B1TEAM2007
	Vertical specialisation	B1HIE2007
External division of labour	Alliances and inter-firm collaboration	B4COLB2007
	Subcontracting/outsourcing	B4SUB2007
Authority	Centralisation and decentralisation of authority	B1DLGSCHD2007, B1DLGSCHDCH
Coordination and control	Monitoring through management practices	B2JITP2007, B2QUAL2007
	ICT monitoring	B3ITUSE2007
Synthetic indicator	Organisational innovation	EINNOVORG
	Organisational change	EBASKET

II.4 Types of organisational designs

1) Bureaucratic and post-bureaucratic forms of organisation

Specific work systems and management models, such as flexible organisations and learning organisations, are often presented in the organisational literature as being non or 'post-bureaucratic'. While a considerable body of literature has focused on the increasing adoption of these forms, the MEADOW employer survey is not limited to capturing them. Many organisations in both the public and private sectors are characterised by bureaucratic dimensions and it is also a common feature to combine bureaucratic and non-bureaucratic structures (Alvesson and Thompson, 2005, p 497). The main characteristic of bureaucracy is predictability of organisational performance by standardisation and regulation of employee's work. The work content in positions is formalised to guarantee that the outcome is independent of the individual holding the position.

Many terms have been used for describing post-bureaucratic organisational forms, such as 'network enterprise' (Castells, 2000), 'postmodern organisation' (Clegg, 1990), 'adhocracies' (Mintzberg, 1983), 'the flexible firm' (Volberda, 1999; Atkinson, 1984), and the 'learning organisation' (Senge, 1993). The main characteristics which differ from bureaucratic organisation are the use of non-hierarchical, flattened, integrated and flexible work systems (Child, 2005; Alvesson and Thompson, 2005).

While it is difficult to design specific questions to capture whether an organisation is bureaucratic or post-bureaucratic, different designs can be characterised in terms of a

mixture of features of the organisational structure, management techniques and practices, and forms of work organisation. Sets of indicators can then be used to measure the extent to which a particular design has been adopted. In this section indicators are proposed for measuring high performance work systems, flexible organisations and learning organisations. There is some overlap in the proposed indicators as these different designs share a 'post-bureaucratic' orientation.

2) High Performance Work Systems

High Performance Work Systems (HPWS) are characterised by a holistic organisation featuring flat hierarchical structures, job rotation, self-responsible teams, multi-tasking, a greater involvement of lower-level employees in decision making and the replacement of vertical by horizontal communication channels (Appelbaum et al., 2000). HPWS emphasise the importance of decentralisation of problem-solving and decision making. This requires three basic components: 1) opportunity for substantive participation in decisions, 2) appropriate incentives and 3) training and selection policies that guarantee an appropriately skilled workforce. Autonomous teams and quality improvement teams contribute to improve the organisational performance, as well as communication with actors outside the employees own work group. The employees in HPWS thus have a substantial autonomy in their work, and they are also able to call on resources when needed. However, while evidence for organisational benefits continue to accumulate, evidence for employee outcomes are increasingly polarised, varying from higher intrinsic reward to work-home spill over and work stress.

Box 7: Indicators for High Performance Work Systems

Indicators	Survey questions
Flat hierarchical structure	B1HIE, B1STRUC
Job rotation/multi-skilling	B1MULTSK
Autonomous teams	B1TEAM, B1DLGSCHD
Training	CRTNON, CRTNOFF
Employee consultation/participation	CBRFANY, CBRIEFN

3) Flexible Organisations

Flexibility is a widely used notion despite the lack of a generally accepted definition (Fellenz, 2000; Volberda, 1999). The meaning of flexibility differs considerably according to the specific area of interest. Flexibility in the area of organisational theory generally refers to an organisation's ability to change or to vary in certain aspects in order to cope with environmental uncertainty (Fellenz, 2000).

Flexibility can be understood as an increased ability to adapt to varying internal or external requirements (Zhang and Luo, 2005). Feibleman and Friend (1945) define organisational flexibility as the ability of an organisation to sustain limited change without severe disorganisation. There are other models of organisation which are built around

the core concept of flexibility and aim at increasing the organisation's ability to operate responsively in a fast changing environment. Such models of organisation include: Burns and Stalker's (1961) organic structure (as opposed to mechanistic structure), Emery and Trist's (1960) socio-technical system, Walton's (1980) high commitment systems, and some forms of decentralised, divisionalised, project management, and matrix structures (see, e.g., Child, 1972). Preece (1986) has proposed the concept of structural flexibility, which is concerned with the extent to which the structure of an organisation enables or hinders responsiveness of members of the organisation to change. This change could be initiated from within the organisation itself or it could be a reactive change in response to changes in the environment of the organisation (see Sethi and Sethi, 1990).

Different studies have established the distinction between two basic kinds of flexibility: functional and numerical. Functional flexibility is designed to increase the possibilities for re-deploying employees between activities and tasks by empowering workers with greater decision-making responsibility and assigning them a greater scope of different activities. This form of flexibility is generally associated with teamwork, autonomous work teams and flat hierarchies (Chadwick and Cappelli, 2002). Since firms aiming for a high degree of functional flexibility need to offer incentives to their employees to mobilise their knowledge and skills, flexible firms often employ financial incentives based on group or company performance (Macduffie, 1995). Further, since functional flexibility requires workers to acquire complex and firm-specific knowledge, firms tend to resort to highly qualified in-house staff. A number of empirical studies have found that functionally flexible firms are both more productive (Black and Lynch, 2004; Zwick, 2004) and more innovative (Hujer and Radic, 2003). Numerical flexibility, in contrast, aims at reducing fixed costs by contracting out jobs or through the use of temporary employment agencies (Gramm and Schnell, 2001). Such policies help to shift the burden of risk associated with demand fluctuations onto external suppliers. Outsourcing can also play an important role.

Flexibility arguably has to be combined with elements of stability. The performance and even the survival of an organisation depends to some extent on its ability to adapt to changing external conditions without implementing changes that transform the basic organisational structure. Earlier studies of the consequences of change for working conditions have showed that such structural stability is more common in core companies and central public administrations than among subcontractors and peripheral production units. The more powerful the position in the production chain, the more stable is the organisational structure (Härenstam and the MOA Research Group, 2005). In addition, there is research showing that working conditions tends to be better in organisations where structural changes are less frequent and extensive (Härenstam et al., 2004).

Box 8: Indicators of the Flexible Organisation

Indicators	Survey questions	
Numerical flexibility	Share of employees with temporary contracts	A TEMP
	Share of employees with part-time contracts	A PARTPC
	Share of employees from employment agencies	A AGENCY, A AGENNUM
	Subcontracting/outsourcing	B4SUB
Functional flexibility	Flat hierarchical structure	B1HIE, B1STRUC
	Job rotation/multi-skilling	B1MULTSK
	Autonomous teams	B1TEAM, B1DLGSCHD

4) Learning Organisations

The general definition of learning organisations proposed by Senge (1993, p. 3) is, "organisations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continuously learning to see the whole together" (p. 3).

Yang, Watkins and Marsick (2004) identify seven interrelated dimensions of a learning organisation at the individual, team and organisation or system level, and they propose a set of instruments for capturing these dimensions. They conclude that the learning organisation is a multi-dimensional construct involving a complex set of interrelations between individuals, teams and the organisation as a whole. Jensen et al. (2007) distinguish science and technology based learning (STI) from informal processes of learning based on doing, using and interacting (DUI) and explore their impact on the company's innovative performance using DISKO survey data. Learning organisations are defined as those with a high probability of using a range of managerial practices designed to foster learning and problem-solving on the part of their employees. These include the use of autonomous groups, quality circles, integration of functions and a high degree of interaction with clients.

Despite the disparate nature of the literature on learning organisations and its largely normative focus, it is possible to identify some common definitional ground beyond the obvious point that learning organisations are those with a capacity to adapt and compete through learning. First, most of the research sees the learning organisation as a multi-level concept and defines the learning organisation in terms of the interrelations between managerial practices, team organisation and individual behaviours. This implies that a linked employer-employee survey design, as proposed in MEADOW, is especially suited for developing measures of the learning organisation. Secondly, the managerial practices identified are multi-dimensional and concern policies in the areas of work organisation, communication and information exchange, and human resources. This implies the need for multiple indicators that could be used by researchers in order to identify the extent to which a particular enterprise or establishment displays the characteristics of a learning organisation.

Box 9: Indicators for learning organisations

Indicators	Survey questions
Autonomous teams	B1TEAM, B1DLGSCHD
Quality circles	B1CIRCLE
Training/skills	B1MULTSK, CRTNON, CRTNOFF
Employee consultation/participation	CBRFANY, CBRIEFN
Performance-based pay	CINCENPAY
Monitoring external technical developments	B2KMEX

II.5 Employment relations**1) Employment security**

There is evidence of increasing variations in the employment conditions since the mid-1980s, mirrored in larger inequalities in real wage, skill levels and job security. These trends have been linked to a decline in the trade union movement in many countries, even if the evidence on job insecurity is mixed and varies between countries and sectors. A factor often cited as an explanation for increasing levels of insecurity is the growing use of non-standard employment contracts including part-time and temporary contracts. From a longer-term perspective, it appears that while levels of employee concern about job security rise and fall with the level of unemployment, they are higher today than in the early 80s (Bryson & McKay, 1997).

Perceptions of employment security are best captured at the employee level. The MEADOW employer survey includes indicators for the use of non-standard employment contracts. By linking the two survey levels, it will be possible to relate differences in the use of such contracts across sectors or nations to differences in the level of perceived employment security.

2) Human resources management

HRM was developed initially in the United States non-union sector. Subsequently, in both the US and Europe, HRM has often been adopted as a complement, if not an alternative, to established collective bargaining arrangements (Katz, 2005). HRM involves management decisions and actions that affect the nature of the membership of the employee to the organisation. The rising interest in HRM has been seen as a response to increasing international competition, increasing complexity and size of organisations, increasing levels of education of the work force, changing values concerning authority, and more concern with career and life satisfaction (Beer et al., 1985). These pressures create a need for more institutional attention to employees, and a consideration of people as a potential asset rather than merely a variable cost. The goal of HRM is thus to tackle the external and internal pressures with strategies and practices for unleashing people's energies and creativity. The human resource dimension is considered to be of strategic importance for the organisation, and thus should be an integral component of strategic management.

HRM is often described as having two sides: a soft side that emphasises commitment and influence, and a hard, practical side, which treats people like any other asset of the organisation (Guest, 1987; Storey, 1992; Legge, 1995; Truss et al., 1997). Using the terminology of Beer et al. (1985), there are four areas that are of major strategic importance for HRM policies. They are human resources flow, employee influence, reward systems, and work systems. 'Human resource flow' deals with the flow of people into, through and out of the organisation. Recruitment, internal staffing, performance appraisal and outplacement are examples in this area. This area also includes policies on career development, advancement and employment security. The area of employee influence deals with the key question on how much responsibility, authority, and power the organisation should delegate to the employees so as to increase their commitment and creativity. Through reward systems, the organisation sends signals on what kind of behaviour and attitudes management seeks from the employees. The rewards may be individual or based on group performance, and reward may compensate attitudes, performance, as well as flexibility. Internal equity in rewards and pay is seen as central to attracting, motivating and retaining employees. The area of work systems is concerned with skills development and training in relation to the division of labour and task attributes.

Box 10: Indicators for employment relations

Indicators	Survey questions	
Contractual arrangements and employment security	Share of employees with temporary contracts	ATEMP
	Share of employees with part-time contracts	APARTPC
	Share of employees from employment agencies	AAGENCY, AAGENNUM
Human Resource Management	Recruitment policies	CRCTSK, CRCTUN, CRTN
	Investments in training	CTRNOFF, CTRNOFFPC
	Investments in skills enhancement	CTRNON, CTRNONPC
	Reward systems for individuals and/or work groups	CINCENPAY
	Performance appraisal and individual career development	CAPPPC, CAPPPRO
	Employee consultation/participation	CBRFANY, CBRIEFN

II.6 Outcomes of organisational change: measuring economic and social performance

The MEADOW employer survey includes indicators on both economic and social performance. Indicators on social performance are limited to measures of employment growth and absenteeism. Other indicators of social performance pertaining to the quality of jobs are best developed at the employee level.

One reason why performance measurement at the organisation level is necessary is to clarify the mission of an organisation and translate its strategies for achieving goals into measurable objectives. Thus performance measures allow the organisation not only to measure its progress towards goal attainment, but also to understand which factors improve its results. Due to the increased need of cost efficiency and privatisations they are also more and more deployed in organisations in the public sector (Salem, 2003). Thereby performance measurement (“How are we doing”) and its evaluation (“Can we do better?”) serve also as a way of legitimating initial organisational change by aligning operational activities and resources with strategic objectives of the organisation and external requirements. Thus, the measurement of organisational performance needs to be considered just as multidimensional as organisational strategies and activities are (Devinney et al., 2005). In order to address this multidimensionality, the use of broad performance measurement systems is necessary. The best known example of a broad performance measurement framework is the ‘Balanced Scorecard’ (Kaplan and Norton, 1992), based on four different perspectives from which performance can be evaluated: the financial perspective, the internal business perspective, the customer perspective and the innovation perspective. Another differentiation is suggested by Venkatraman and Ramanujam (1986) who distinguish between measures of ‘organisational performance’ and ‘organisational effectiveness’.

The complexity of performance measurement applies to organisations in both the private and public sectors. However, while the need of performance measurement has widely been acknowledged in the private sector, this issue is relatively new to public sector organisations. Increasing budget constraints, the need for a more efficient use of resources or the increasing international competition and harmonisation (i.e. in the case of national education systems) has stressed the relevance of a systematic performance monitoring in public organisations in the context of New Public Management practices.

1) Challenges for measuring organisational performance

Following the overview of Devinney et al. (2005) and Armbruster et al. (2008), there are several aspects which should be taken into account when measuring organisational performance. In the following, different types of measurement problems are identified and possible solutions are presented.

Different performance claims of the organisation’s local stakeholders:

Problem: different stakeholders are supposed to have different claims to the organisation’s performance which have to be balanced and satisfied by the organisation’s management.

Solution: various aspects of performance dimensions according to the different expectations of different stakeholders should be taken into account (i.e. financial performance, economic performance, social performance)

The organisation’s individual strategic positioning in relation to its competitive environment:

Problem: different performance measures gain their relevance and importance from the

organisation’s specific goals which in turn are based on the market position and the individual internal pool of resources, competencies and capabilities. Given that each organisation pursues different goals by many different types of strategy, this results in a multidimensional relationship between the organisation’s goal and the various forms of organisational change. Thus, to measure the consequences of various dimensions of organisational change it is necessary to trace back the variety of performance measures to performance dimensions, which are closely linked with the underlying goals of organisational change. By referring only to overall performance measures of accounting or financial market performance, the analysis runs the risk to lose its focus as these variables are affected by the total sum of organisational activities.

Solution: as different goals of organisations aim at the optimisation of different performance dimensions, it is important to consider different performance measures (i.e. innovative performance quality of products/processes, flexibility) and to identify applicable objective and/or subjective performance measures which are best linked to the goals of organisational change.

Different time frames of organisational performance measures:

Problem: hardly any organisational change is directly reflected in a measurable change in the organisational performance as there is a certain ‘time-lag’ between stimulus (organisational change) and reaction (increased performance). This time-lag varies across different kinds of organisational change. While a change in the distribution channel might lead to a quickly improved turnover ratio, the implementation of a new organisational concept like TQM will probably take much longer time to show its performance effects. Different forms of organisational change are therefore supposed to have different temporal associations to performance measures (Jacobson, 1987).

Solution: the best solution to allay this problem would probably be to conduct a panel survey in which different forms of organisational changes can show their effects over time.

Bias in subjective performance measures:

Problem: like all types of subjective measures, subjective measures of organisational performance might also be subject to bias arising from the cognitive availability of events, problems or activities (Tversky and Kahnemann, 1973). Furthermore, retrospective recalls of informants are likely to reconstruct the past to make it consistent with subsequent performance expectations and current beliefs (March and Sutton, 1997).

Solution: whenever possible, subject performance measures should be supplemented by objective questions about facts and figures.

Cross-sectional correlations between performance measures:

Problem: in general, performance measures are commonly conceptualised as the dependent variable of organisational change (March and Sutton, 1997). But by aggregating different performance measures to a single performance construct of ‘organisational performance’, many studies tend to ignore positive cross-sectional correlations between them. For example, high process performance of an organisation might lead

to an above average innovation performance which in turn results in superior financial performance (Venkatraman and Ramanujam, 1986).

Solution: when assessing organisational performance, it is important to take into account possible structural relationships and interdependencies of the deployed performance measures. As these relationships reveal over time it is recommendable either to operationalise performance measures according to a defined point in time or to conduct panel studies which allow for ex post analysis of such inter-relationships of performance measures.

Difficulties in identifying distinct cause-and-effect relationship between organisational change and organisational performance:

Problem: activities of organisational change are often related to specific components of organisational performance. Due to the complexity of organisational change, it is obvious that a single organisational action will more or less impact other aspects of performance as well (Devinney et al., 2005: 10). In addition to the described general problem of time-lags between change and performance, this multidimensionality of causalities between organisational performance measures lead to some difficulties in deducing the performance of an organisation in different points in time. The short-term effects of organisational activities might be different from their long-term outcomes (March, 1994). For example, a poor process performance might cause managers to tighten controls and place a higher priority on formalisation in order to increase efficiency. But in the long run, this probably turns out to damage the organisation's flexibility to adapt to unforeseen changes in the external environment (Staw et al., 1983; March and Shapira, 1987).

Solution: at the moment, there is no real solution to this problem as the research on this issue is still at its very beginning. But nevertheless, such aspects and restrictions should always be taken into account analysing organisational performance. Therefore, it is not applicable to suggest any theoretical linkage or causalities between drivers of organisational change, forms of organisational change and performance outcome in the questionnaire *a priori*. Instead, such linkages between the constructs should be conducted through statistical methods in order to be able to grasp the whole range of probable causalities according to the behavioural heterogeneity of firms.

2) Performance indicators

Performance, as stated previously, is a multi-dimensional concept that covers very different aspects in which a company or public organisation may be doing well or not. The narrower definitions tend to refer to economic aspects like profits, turnover or market shares or efficiency of resource use. Broader definitions might also be related to growth potential, quality of products and services, the work climate, reaction time, potential for innovations, ability to attract high quality workers, labour turnover, absenteeism, et cetera. Integrating both strands of definition, the guidelines distinguish between economic and social dimensions of organisational performance.

Economic performance measures are related to ratios and indicators at the organisational level and encompass all areas of the organisation's production of goods and services like finance, product and service performance, process performance (i.e. quality,

flexibility, productivity) etc. In contrast, the dimension of social performance is much broader. Such social performances include for example the provision of new jobs through employment growth, the provision of 'good' working conditions or the support of public infrastructure. But it is important to mention, that economic and social performance cannot always be clearly differentiated from each other as they might be mutually dependent from each other.

For performance measures along these lines, one may generally distinguish between quantitative measures, sometimes referred to as 'objective', and qualitative measures, referred to as being 'subjective'. Each offers different opportunities and complications for questionnaire design and the two types are therefore considered separately below. The main decision to be taken is how performance can be measured in the MEADOW employer survey in relation to change. This section provides some theoretical and practical considerations.

Quantitative measures

The most direct measures of the economic performance of a company are profits, turnover or value added (turnover minus non-labour input costs). Commonly, these are used as per capita figures, where profits are also expressed as percentage of turnover. Experience demonstrates that such numeric questions usually yield relatively high percentages of unit non-response – be it because the respondent does not have the exact figures at hand during the telephone interview, be it because this information is considered confidential and is therefore not revealed even in an anonymous scientific survey. A problem that is specific to establishment surveys is that these figures are often not available for the individual establishments of a multi-site organisation. Another limitation of this type of economic key figures is that they are not fully comparable across sectors, size classes and regions, since the same turnover numbers or per capita value added may be indicative of good performance in one case and of relatively bad performance in other cases. Experience from the OSA Labour Demand panel – the Dutch establishment survey that currently uses both telephone interviews and a written questionnaire – indicates that questions about turnover and profits should, for the reasons mentioned above, not be asked in a telephone interview with general managers or HR managers. On the other hand it proves very possible to ask for other quantitative information in the telephone interviews, such as the vacancy rate, personnel growth or the absenteeism rate.

Qualitative or subjective measures

Productivity and performance indicators can also be collected by asking for 'subjective' or qualitative indicators, such as the assessment of productivity as compared to competitors, development of productivity in the past, and future expectations. The same applies to indicators for the economic situation of the establishment (very profitable / profitable / not profitable; profitability as compared to competitors; development of profitability over time). In order to capture the various aspects of firm performance, indicators could also refer to experienced and expected growth of the personnel size and perceived or expected bottlenecks with respect to worker motivation, recruitment, labour turnover and absenteeism. Such indicators are usually found to be more suitable for telephone interviews than the more detailed numerical information of quantitative

measures, as they can more easily be reported by the respondents, resulting in more reliable information and less non-response. Although qualitative indicators are usually less refined than quantitative indicators – particularly if these are measured as continuous variables – they may provide the more relevant and reliable information and allow better comparison across very different establishments. The self-assessments and perceptions may reflect a specific dimension of performance better than the financial key figures and similar measures can be used that relate to a wider range of performance issues.

According to Forth and McNabb (2008), there are obvious drawbacks and advantages to both objective and subjective performance measures. It is also important to remember that they measure performance differently. Subjective measures ask for a comparison most commonly with competitors, using more broadly defined measures. Alternatively, it may be considered to add direct ‘quantitative’ questions about personnel growth, the vacancy rate and the absenteeism rate.

Whether quantitative or qualitative measures are the most appropriate depends on the interview method, on the research questions that are studied, and on the performance dimensions that are considered. In the literature on performance measurement in relation to HRM, innovation or the organisation of work, the dimensions given in box 11 are thought of as particularly relevant.

Box 11: Indicators for Organisational performance

Indicators		Survey questions
Economic performance	Labour productivity	ELAB
	Product or service innovation	EINNOVPRD, PRDMRKT
	Process innovation	EINNOVPRC
	New marketing methods	EINNOVMRK
	Market growth	DMKTCHNG
Social performance	Absenteeism	AABSENT
	Employment growth	AEMPCHG
	Reasons for decline in employment	AEMPCH-CAUSE, AEMPCDOT

Except for very specific production processes, productivity of individual workers or divisions is difficult to measure. At the level of establishments, productivity is usually measured in terms of the value added per worker. Defined in this way, productivity is closely related to the financial key figures. For most of the dimensions listed above, both quantitative and qualitative measures can be used and information may refer to the current situation, development over a period of time, expected future developments, or an assessment relative to other similar establishments or regional or sector averages.

Linking performance indicators to external information

Additional sources of information on performance may be acquired by linking interview data with register data or other publicly available information (e.g. company reports). However, access to this information is often restricted (as far as possibilities to link interview data with register data is concerned) or labour intensive (as far as individual research in company reports or other publicly available information is concerned).

Based on earlier experiences with linked external information in establishment surveys, some methodological issues are pertinent. One is that information may be linked that is related to different entities: survey data often relates to the local establishment while registers and other publicly available data are normally related to the company, which makes a difference in the case of multi-site organisations. Also, available register data might differ in terms of content (turnover, value added, and profit) and in terms of reference period (available data might be outdated). As long as these limitations are taken into account, linking survey data with register data can only enrich the available information about the establishments.

A question asking permission to link the data collected to other data sources is included at the end of the questionnaire (JADMRECR). This question could be adapted to meet national regulations about data linking. Of course, complete confidentiality should be guaranteed².

II.7 Modules

The principle of a core questionnaire plus modules has been established in chapter II of the Guidelines. Two possible areas for module development are considered: public sector reform and the use of ICTs.

1) Public sector reform

In using the same questions for the public and private sectors, the survey implicitly focuses on dimensions that are comparable between the public and private organisations. The adoption of this approach in MEADOW is linked to the fact that with the New Public Management ideology many practices and techniques developed in the private sector have been imported to the public sector. However, this does not exhaust all the perspectives on organisational structure and change in the public sector and specific public sector modules could be designed to cover them.

One factor which appears to differentiate the public sector is a tendency towards more ‘administrative orthodoxy’. Underlying this is the belief that sound management requires a strict hierarchy of accountability, strict accounting and control, elaborated reporting requirements and so on. The MEADOW core survey does not develop measures for these features and they could be addressed in a separate module. Another area where there are important differences concerns performance measures. While reforms based on the new public management have seen the introduction of private sector type

² See experience in WERS www.blackwell-synergy.com/toc/irj/39/2 recommending measurement based on both types of measures.

performance measures into the public sector, there are dimensions of performance with no obvious private-sector counterparts. These include the scientific output of public research organisations, the level and quality of education and training, and the quality and level of coverage of healthcare. Public administration may also be evaluated on the criteria of transparency as related to democratic principles. Transparency laws are thus seen as means of increasing public trust in government and the optimistic view is that they will produce a culture of openness in public organisations.

2) Information and Communication Technologies

The introduction of new ICT in enterprises is an important driver of organisational change and the complementarities that exist between ICT adoption and the organisation of work have an impact on the performance advantages that can be derived from ICT use. ICT can be an integral part of more effective knowledge management and it can be used in such areas as product design and market research. The MEADOW Guidelines propose a short ICT module that could be included in the core employer survey in instances where the respondent is the ICT manager. The module includes questions on the use of electronic data interchange with external clients or suppliers and on the use of specialised software in the following areas: client or customer relationship software, performance tracking software, enterprise resource planning software, and collaborative work software. This far from exhausts the areas of ICT use that are relevant to a survey on organisational change, and an extended module could be developed to include additional questions covering related areas of ICT adoption or use: data storage or automated search software as part of document management or knowledge management tools; data analysis software or tools for data mining or statistical analysis. As a measure of e-business a question could be included on the use of a website or extension of the intranet that is restricted to business partners (usually called an extranet). An extended module could also provide further information on e-commerce by explicitly asking whether the enterprise has sent or has received orders for products or services via the internet.

III. Background establishments characteristics

The employer questionnaire identifies key establishment characteristics that are necessary to set the scene where organisational change takes place.

1) Ownership structure, age and size of the establishment

Ownership includes a number of related dimensions including whether the organisation is owned publicly or privately or under joint public-private ownership, whether it is part of a larger organisation such as a group or conglomerate and whether it has international ownership. Several studies have shown differences in working conditions between public and private establishments. Moreover, employer units organised in larger groups or networks may be subject to control from other levels. This control may be exercised through economic and financial means or through technical and administrative measures. The increasing incidence of splits and take-overs of establishments seems to have

resulted in a dispersion of employer's responsibility over working conditions and human resources management across different organisational levels (Larsson, 2000). It seems likely that the ability to integrate various aspects of leadership not only varies due to the size of the organisation but also due to ownership and control. The age and size of the establishment are important background characteristics, connected with the life cycle of the establishment and which affect organisational design as has been shown by contingency theory.

2) Position of enterprise and business activity

The position of an organisation in the public sector or in the private sector has a significant impact on the design of work systems. Further, it is important to know the position of an organisation in relation to larger networks (public enterprise) or production chains (private enterprise) and their market position including their use of outsourcing. Trade conditions are a measure of the organisation's external conditions, its degree of competition, the importance of local, national, or international markets, and the degree to which its products or services are standardised or customer-tailored. It can be assumed that trade conditions have an impact on the organisation's decision-making latitude and thereby on the possibilities for achieving good working conditions. Questions about the company's trade position and core business activity can easily be surveyed at either the enterprise or establishment level.

3) Types of trade and operations

Work environment is settled to some extent by what is done, that is by the product or service produced. The nature of the product or service provided is also an indicator of the organisation's external borders. There are reasons to believe that organisations producing industrial products differ from organisations providing services (Kohn, Miller, and Schooler, 1983; Marshall, Barnett and Sayer, 1997). While some earlier research has focused on the relation between organisational structure and production technology (e.g. Woodward, 1958), the role of what is actually produced in determining work organisation has received surprisingly little attention in the literature.

Earlier classifications of types of trade focussed on industrial production and more recently categorisations covering both industry and services have been developed that address questions of what is produced and their requirements in terms of knowledge and technology (Giertz, 2000).⁵

⁵ Giertz (2000), for example, has recognised that there are differences in contextual and inter-organisational factors between different types of industries, and has developed a classification scheme on this basis encompassing 6 large groups: A) Raw material production, B) Manufacturing, C) Distribution of goods, D) Basic common services, E) The service sector, F) Spidering. These groups are divided into 24 types of operations. The approach has been operationalised in an MOA-study focusing on 'good' and 'bad' jobs (Härenstam and the MOA Research Group, 2005).

4) Personnel structure

Lastly, the structure of the workforce in terms of age, sex and occupation are important background information to know about the establishment. The nature of interactions between the employer and employees around organisational changes is influenced by the demographic and occupational structure of the organisation. Critical outcomes of organisational changes are also likely to vary according to workforce composition.

Box 12: Indicators for establishment demographics and workforce composition

Indicators	Survey questions	
Ownership, establishment, age and size	Public/Private	APUB, ACUSTM, ACUSTIMP
	Part of a larger organisation	AINDP
	Domestic/foreign ownership	AOWNDM
	Workplace size	AEMP, ATEMP, APARTPC, AAGENCY
	Workplace age	AWPAGE
Position and business activity	Sector Industry (Code using NACE rev. 2)	ASECTOR
	Type of product or service	ATYPE
Personnel structure	Age	AAGEY, AAGEO
	Occupation	AOCC
	Gender	AGNDR, AGNDRM

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Appendix to chapter III

The employer survey questionnaire

Introduction

[] Designates notes for the programmer and () are interviewer notes.

[Note for programmer: With a few exceptions, include two response options for all questions: 8 = 'Don't know' and 9 = 'Refused'. The exceptions are for questions B3ITUSE and B3ITUSE2007 where the respondent is instructed to respond 'Don't know' where relevant]

(Interviewer note: Never read out loud the response options 'Don't Know' and 'Refused'. Use these options only if given by the respondent.)

My name is [INTERVIEWER NAME] and I am calling on behalf of [SURVEY SPONSORS] who are conducting research on the way organisations operate. The [SURVEY SPONSORS] recently wrote to you asking for your help with this research.

The interview will take about 30 minutes and all of the information that you give us will be treated in the strictest confidence.

Most of the questions in the interview will be about this establishment, that is [Establishment Name: EN] at [establishment address: ADDRESS].

But first I would like to ask just a couple of questions about you.

ATITLE

What job do you do at this establishment?

Record verbatim response

(interviewer note: Verbatim response to be coded using the following code, refused is not allowed)

1. General Manager
2. Owner / proprietor
3. Human Resource Manager / Personnel Manager
4. Other (please specify)

ATENURE

How long have you been doing this job at this establishment?

(interviewer note : code to the nearest year. Use '0' if less than 6 months)

Range : 0..50

Section A: Demographics and workforce characteristics

Thank you. I will now move on to the main body of the interview. Just to remind you, I will be asking you about [Establishment Name: EN] at [establishment address : ADDRESS].

ASECTOR

What is the main activity of this establishment?

(Interviewer note : probe for clarification if necessary)

[To be coded post-fieldwork to NACE rev. 2]

AWPAGE

How many years has your establishment been in operation? Please include time spent at previous locations.

1. Less than 2 years
2. 2 to 4 years
3. 5 to 9 years
4. 10 to 19 years
5. 20 to 49 years
6. 50 years or more

AINDP

Which best describes [EN] at [ADDRESS]?

1. A single independent establishment
2. One of a number of establishments belonging to a larger enterprise or organisation

APUB

A public sector organisation is either wholly owned by the government or the government has a majority share. Is your establishment part of:

1. The private sector
2. The public sector

ACUSTM

Does your establishment produce goods for, or provide services to, any of the following? [provide separate 'yes or no' response options to each of questions a to d]

- a. [only ask if AINDP = 2] Sister companies or other establishments within your own enterprise or organisation
- b. Private sector enterprises
- c. Public sector such as government agencies or government owned corporations
- d. Individual consumers

1. Yes
2. No

ACUSTIMP [only ask if more than one “yes” response given to ACUSTM]
To which of these four groups does your establishment provide the largest volume of goods or services? [Respondent can choose one only]

1. [only ask if AINDP=2] Sister companies or other establishments within your own enterprise or organisation
2. Private sector enterprises
3. Public sector such as government agencies or government owned corporations
4. Individual consumers

ATYPE

Which of the following best describe the main products or services produced in your establishment? [Respondent can choose one only]

1. Products or services that are customised to meet the customer’s specifications
2. Standardised products or services

AOWNDM [only ask if APUB=1]

Is this establishment domestically-owned or foreign-owned? If it has a mixture of domestic and foreign ownership, make your decision based on who has majority ownership of over 50%.

[Respondent can choose one only]

1. Wholly or mostly domestically-owned
2. Wholly or mostly foreign-owned

AEMP

Currently, how many employees do you have on the payroll at this establishment? Include all employees directly paid by your establishment (i.e. part-time, full-time, permanent and temporary employees)

1. Up to 19
2. 20 to 49
3. 50 to 99
4. 100 to 249
5. 250 to 499
6. 500 to 999
7. 1,000 or more

(Interviewer note: if asked, this excludes employees paid through an employment agency.)

ATEMP

What percentage of the employees at this establishment has a temporary contract? This includes all employment contracts with an end date or for a defined period of time, even when the contract is for several years.

1. None
2. 1% to 9%
3. 10% to 24%
4. 25% or more

APARTPC

What percentage of the employees at this establishment is part-time? ‘Part-time’ includes all working-time arrangements below the usual full time hours that apply at your establishment.

1. None
2. 1% to 24%
3. 25% to 49%
4. 50% or more

AAGENCY

Are there any employees contracted through an employment agency currently working at this establishment?

1. Yes
2. No

AAGENUM [only ask if AAGENCY = 1]

Please think of the total number of people working at this establishment, including employees on your payroll and people contracted through an employment agency. What percent of this total consists of people from an employment agency?

1. Up to 4%
2. 5% to 9%
3. 10% to 24%
4. 25% or more

[only read if AAGENCY = 1]

In the remainder of the interview, when I ask questions about the employees at this establishment, I would like you to include people from an employment agency.

AEMPCH [only ask if AWPAGE>=2]

How does the total number of employees at your establishment today compare with the number two years ago, that is in [MONTH, YEAR]?

1. The number of employees has decreased by over 5%
2. The number of employees has increased by over 5%
3. The number of employees is approximately the same

AEMPCHa [only ask if AEMPCH = 2]

Approximately how much has employment increased?

1. Increased from 5% to 9%
2. Increased by 10% to 24%
3. Increased by 25% or more

AEMPCHb [only ask if AEMPCH = 1]

Approximately how much has employment decreased?

1. Decreased by 5% to 9%
2. Decreased by 10% to 24%
3. Decreased by 25% or more

AEMPCH-CAUSE [only ask if AEMPCH = 1]

Were any of the following major reasons for the decline in employment?

[Provide separate 'yes or no' response options to each of questions a to e]

- a. Productivity increases due to technological innovation
- b. Productivity increases due to organisational changes or restructuring
- c. Decline in the market for your goods or services
- d. Sale or closure of part of your enterprise or organisation
- e. [only ask if APUB=2] Budgetary cuts

1. Yes
2. No

AEMPCDOT [only ask if none of the above selected]

Can you briefly describe the reason for the decline in employment?

.....

.....

AGNDR

What percentage of the workforce at this establishment is female?

1. None
2. 1% to 24%
3. 25% to 49%
4. 50% to 74%
5. 75% or more

AGNDRM

What percentage of the managers at this establishment is female?

1. None
2. 1% to 4%
3. 5% to 9%
4. 10% to 24%
5. 25% or more

AOCC

Approximately what percentage of the workforce at this establishment belongs to each of the following occupational groups?

1. Managers
2. Professionals and skilled technicians
3. Skilled craft and trade workers
4. Skilled clerical and sales workers
5. Low-skilled and unskilled workers

[CATI check if sum of 1+2+3+4+5 = 100%]

AAGEY

What percentage of the workforce at this establishment is under 30 years of age?

1. None
2. 1% to 24%
3. 25% to 49%
4. 50% or more

AAGEO

What percentage of the workforce at this establishment is over 55 years of age?

1. None
2. 1% to 24%
3. 25% to 49%
4. 50% or more

AABSENT

Over the past 12 months, what percentage of total working days at this establishment has been lost due to employee sickness?

1. None
2. 1% to 4%
3. 5% to 9%
4. 10% or more

Section B: Organisational structure and change

I am now going to ask you a series of questions about the structure and organisation of your establishment. [if AWPAGE >= 2] For some questions I will ask about the situation at this establishment today and about the situation 2 years ago.

1) Work organisation

I will start by asking about how work is organised at this establishment.

B1HIE

How many organisational levels are there in your establishment, including the highest level (for example, senior management) and the lowest level (for example, production staff)?

Number:

B1HIE2007 [only ask if AWPAGE >= 2]

How many organisational levels were there 2 years ago?

Number:

B1DIVTYPE

Does this establishment have each of the following types of divisions or departments?

[Provide separate 'yes or no' response options to each of questions a to c]

- a. Separate divisions or departments by function: sales, production, administration, research, etc.
- b. Separate divisions or departments by type of product or service
- c. Separate divisions or departments by geographical area: sales regions, etc.

1. Yes
2. No

(Interviewer note: if asked, the respondent should exclude divisions or departments at other establishments of the same firm)

B1NDIV

How many separate departments or divisions report directly to the head of this establishment?

Number:

B1STRUC

Who normally decides on the planning and execution of the daily work tasks of your non-managerial employees?

1. The employee undertaking the tasks
2. Managers or work supervisors
3. Both employees and managers or supervisors

B1DLGQLT

Are each of the following responsible for quality control?

[Provide separate 'yes or no' response options to each of questions a to e]

- a. The employee undertaking the tasks
 - b. Managers or work supervisors
 - c. Specialist group or division within the enterprise or organisation
 - d. External groups – customers, external evaluation experts, etc.
 - e. [only ask if responses a to d are all 'no'] Quality control not relevant to this establishment
1. Yes
 2. No

B1TEAM

Are any of the employees at this establishment currently working in a team, where the members jointly decide how work is done?

1. Yes
2. No

(interviewer note : if asked, a work team is sometimes called an autonomous team or a self-directed team)

B1TEAMPER [only ask if B1TEAM = 1]

What percentage of the employees at this establishment currently works in such teams ?

1. Up to 24%
2. 25% to 49%
3. 50% to 74%
4. 75% or more

B1TEAM2007

Did any of your employees work in such a team two years ago?

1. Yes
2. No

B1TEAMCHG [only ask if B1TEAM 2007= 1]

Compared with two years ago, has the percentage of employees currently working in such teams:

1. Increased?
2. Decreased?
3. Remained approximately the same?

B1CIRCLE

Are any of the employees at this establishment currently involved in groups who meet regularly to think about improvements that could be made within this workplace?

1. Yes
2. No

B1CIRCLEPER [only ask if B1CIRCLE=1]

What percentage of employees at this establishment currently participates in such groups?

1. Up to 24%
2. 25% to 49%
3. 50% to 74%
4. 75% or more

B1CIRCLE2007

Did any of your employees participate in a group to think about improvements two years ago?

1. Yes
2. No

B1CIRCLECHG [only ask if B1CIRCLE2007=1]

Compared with two years ago, has the percentage of employees participating in such groups

1. Increased?
2. Decreased?
3. Remained approximately the same?

B1DLGSCHD

Can any of the non-managerial employees at this establishment choose when they begin or finish their daily work, according to their personal requirements?

1. Yes
2. No

B1DLGSCHDPER [only ask if B1DLGSCHD = 1]

What percentage of the non-managerial employees at this establishment can currently choose when they begin or finish their daily work?

1. Up to 24%
2. 25% to 49%
3. 50% or 74%
4. 75% or more

B1DLGSCHD2007

Could any of the non-managerial employees at this establishment choose when to begin or finish their daily work two years ago?

1. Yes
2. No

B1DLGSCHDCH [only ask if B1DLGSCH2007 = 1]

Compared with two years ago, has the percentage of non-managerial employees who can choose when to begin and finish their daily work

1. Increased?
2. Decreased?
3. Remained approximately the same?

B1MULTSK

Are any of the employees at this establishment trained to rotate tasks with other workers? The training could have taken place outside or within your establishment.

1. Yes
2. No
3. Not relevant

(Interviewer note: A response of 'not relevant' is valid if a high level of required skills or expertise prevents employees from rotating tasks)

B1MULTSK2007[only ask if B1MULTSK = 1]

Compared with two years ago, has the percentage of employees trained to rotate tasks with other workers?

1. Increased
2. Decreased
3. Remained approximately the same

2) Management practices

I am now going to ask about your establishment's use of several management practices.

B2QUAL

Does this establishment monitor the quality of its production processes or service delivery?

1. Yes, on a continuous basis
2. Yes, on an intermittent basis
3. No
4. Not relevant

B2QUAL2007 [only ask if AWPAGE>=2]

Did this establishment monitor quality 2 years ago?

1. Yes, on a continuous basis
2. Yes, on an intermittent basis
3. No
4. Not relevant

B2JITP

Does this establishment use an automated system to minimise inventories, supplies, or work-in-progress? These are sometimes known as just-in-time or lean production systems or as working according to a zero buffer principle.

1. Yes
2. No
3. Not relevant

B2JITP2007 [only ask if AWPAGE>=2]

Did this establishment operate such a system 2 years ago?

1. Yes
2. No
3. Not relevant

B2KMDBASE

Do employees in this establishment regularly up-date databases that document good work practices or lessons learned?

1. Yes
2. No

B2KMDBASE2007 [only ask if AWPAGE>=2]

Did employees in this establishment regularly up-date such databases 2 years ago?

1. Yes
2. No

B2KMEX

Does this establishment monitor external ideas or technological developments for new or improved products, processes or services?

1. Yes, with staff assigned specifically to this task
2. Yes, as part of the responsibilities of general staff
3. No

B2KMEX2007 [only ask if AWPAGE>=2]

Did this establishment monitor external ideas or technological developments 2 years ago?

1. Yes, using staff assigned specifically to this task
2. Yes, as part of the responsibilities of general staff
3. No

B2CUSAT

Does this establishment monitor customer satisfaction through questionnaires, focus groups, analysis of complaints, or other methods?

1. Yes, on a regular basis
2. Yes, but infrequently
3. No

B2CUSAT2007 [only ask if AWPAGE>=2]

Did this establishment monitor customer satisfaction 2 years ago?

1. Yes, on a regular basis
2. Yes, but infrequently
3. No

3) Use of Information and Communication Technologies (ICTs)

B3WEB

Does this establishment have a website?

1. Yes
2. No

B3WEB2007 [only ask if AWPAGE>=2]

Did this establishment have a website 2 years ago?

1. Yes
2. No

B3WEBSERV [only ask if B3WEB = 1]

Does your current website provide online services such as sales, ordering, reservations, downloads, etc?

1. Yes
2. No

B3WEBSERV2007 [only ask if B3WEBSERV = 1]

Compared to two years ago, has the number of services provided by your website

1. Increased?
2. Decreased?
3. Remained approximately the same?

B3EMPL

What percentage of the employees at this establishment uses computers as part of their normal work duties?

1. None
2. 1% to 24%
3. 25% to 49%
4. 50% to 74%
5. 75% or more

(interviewer note: Explain, if asked, that a computer refers to the use of personal computers, micro-computers, mini-computers, mainframe computers or laptops. It does not include the use of other equipment such as sales terminals, scanners, or machine monitors.)

ICT MODULE

ONLY ask if the ICT manager is interviewed

B3ITUSE

I would like to ask you about your establishment's use of five types of specialised information technology. If you are not familiar with each type of information technology, please answer 'don't know'.

Does your establishment use each of the following types of information technology?

[Provide separate 'yes', 'no', and 'don't know' response options to each of questions a to e]

- a. Client or customer relationship software
 - b. Performance tracking software
 - c. Enterprise Resource Planning software
 - d. Collaborative work software
 - e. Electronic Data Interchange with external clients or suppliers
1. Yes
 2. No
 3. Don't know

B3ITUSE 2007

Were you using each of these five types of specialised information technology two years ago?

[Provide separate 'yes', 'no', and 'don't know' response options to each of questions a to e]

- a. Client or customer relationship software
 - b. Performance tracking software
 - c. Enterprise Resource Planning software
 - d. Collaborative work software
 - e. Electronic Data Interchange with external clients or suppliers
1. Yes
 2. No
 3. Don't know

4) Outsourcing and Collaboration

I am now going to ask some questions about this establishment's activities and its relations with other establishments or organisations.

B4ACTV

Are each of the following activities carried out at this establishment?

[Provide separate 'yes and no' response options to each of questions a to e]

- a. Design or development of new products or services
 - b. Production of goods or services
 - c. Procurement of inputs such as materials, parts, components, or services
 - d. Sales or marketing of goods or services
 - e. Administration
1. Yes
 2. No

B4COLB [only ask if at least one of B4ACTV=1 and include each activity where B4ACTV=1]

Is this establishment currently collaborating with other establishments or organisations in carrying out each of the following activities [the following activity]?

[Provide separate 'yes' and 'no' response options to each of questions a to e]

- a. Design or development of new products or services
 - b. Production of goods or services
 - c. Procurement of inputs such as materials, parts, components, or services
 - d. Sales or marketing of goods or services
 - e. Administration
1. Yes
 2. No

B4COLB2007 [only ask if AWPAGE \geq 2 and if B4COLB=1 for at least one item]

Did this establishment collaborate with other establishments or organisations on any of these activities [this activity] two years ago?

1. Yes
2. No

B4SUB

Is this establishment partly or entirely outsourcing each of the following activities [this activity] to a third party that is not owned by your establishment or its parent company?

[Provide separate 'yes' and 'no' response options to each of questions a to e]

- a. Design or development of new products or services
 - b. Production of goods or services
 - c. Procurement of inputs such as materials, parts, components, or services
 - d. Sales or marketing of goods or services
 - e. Administration
1. Yes
 2. No

B4SUB2007 [only ask if AWPAGE \geq 2]

Did this establishment partly or entirely outsource or subcontract any of these activities [this activity] to another organisation two years ago?

1. Yes
2. No

Section C: Human Resources

I am now going to ask you a series of questions about human resources management including questions on training and communication.

CRCTSK

Has your establishment encountered any difficulties over the last 2 years in recruiting staff for jobs which normally require a formal vocational qualification or university degree?

1. Yes
2. No

CRCTUN

Has your establishment encountered any difficulties over the last 2 years in recruiting staff for low or unskilled jobs which normally do not require a formal vocational qualification or university degree?

1. Yes
2. No

CRTN

Has your establishment encountered any difficulties over the last 2 years in retaining staff?

1. Yes
2. No

CAPPPC

Approximately what percentage of your employees has a performance appraisal or evaluation interview at least once a year?

1. None
2. 1% to 24%
3. 25% to 49%
4. 50% or more

CAPPPRO [only ask if CAPPPC>1]

Are decisions about employee promotion linked to the outcome of their performance appraisal?

1. Yes, the performance appraisal is the major factor that influences promotion
2. Yes, but the performance appraisal is one of several factors that influence promotion
3. No

CINCENPAY

Approximately what percentage of the employees at this establishment has some part of their pay directly determined by their performance, or by the performance of a wider group?

1. None
2. 1% to 24%
3. 25% to 49%
4. 50% or more

CTRNOFF

Have any of your employees been given paid time-off from their work to undertake training in the past 12 months, either inside or outside your establishment's premises?

1. Yes
2. No

CTRNOFFPC [only ask if CTRNOFF = 1]

What proportion of employees has been given paid time-off from their work to undertake training in the past 12 months?

1. Up to 24%
2. 25% to 49%
3. 50% to 74%
4. 75% or more

CTRNON

Over the last 12 months, have any of your employees received on-the-job training to improve their skills?

1. Yes
2. No

CTRNONPC [only ask if CTRNON=1]

What proportion of employees has received on-the-job training in the past 12 months?

1. Up to 24%
2. 25% to 49%
3. 50% to 74%
4. 75% or more

CBRFANY

Do you have meetings between line managers or supervisors and all the workers for whom they are responsible?

1. Yes
2. No

(Interviewer note: if asked, these are sometimes known as 'briefing groups' or 'team briefings')

CBRIEFN [only ask if CBRFANY=1]

How often do these meetings take place?

1. Every day
2. At least once a week
3. At least once a month
4. At least once a year

Section D: Economic context and strategic objectives

I am now going to ask you some questions about the economic and market environment of your enterprise.

DMRKT [only ask if APUB=1 and if ACUSTM > 1]

(i.e. a private sector workplace that trades outside of its organisation)

Which of these geographical areas accounted for the largest share of your turnover between 2007 and 2009?

1. National
2. International

DMRKT PUB [only ask if APUB=2 or (APUB=1 and ACUSTM = 1)]

(i.e. a public sector workplace, or a private sector one that does not trade)

Which of these geographic areas received the largest share of the goods or services that you supplied between 2007 and 2009?

1. Local or regional
2. National
3. International

DMKTCHNG [only ask if APUB=1 and if ACUSTM > 1]

(i.e. a private sector workplace that trades outside of its organisation)

Compared to two years ago, has the total turnover of the goods and services produced by this establishment

1. Increased by over 5%?
2. Decreased by over 5%?
3. Remained approximately the same?

DMRKTCHNG PUB [only ask if APUB=2 or (APUB=1 and ACUSTM = 1)]

(i.e. a public sector workplace, or a private sector one that does not trade)

Compared to two years ago, has the total amount of goods or services supplied by this establishment

1. Increased by over 5%?
2. Decreased by over 5%?
3. Remained approximately the same?

DMKTINC [only ask if DKMKTCHNG=1 or DMRKTCHNG PUB = 1]

Approximately how much has your [turnover / total amount of goods or services supplied] increased?

1. Increased by 5% to 9%
2. Increased by 10% to 24%
2. Increased by 25% or more

DMKTDEC [only ask if DKMKTCHNG=2 or DMRKTCHNG PUB = 2]

Approximately how much has your [turnover / total amount of goods or services supplied] decreased?

1. Decreased by 5% to 9%
2. Decreased by 10% to 24%
2. Decreased by 25% or more

DOPCHNG

In the last two years, did your establishment make significant new investments, changes in job tasks, or other major changes to your operations in response to each of the following factors?

[Provide separate 'yes' and 'no' response options to each of questions a to h]

- a. Changes in health and safety regulations
- b. Changes in environmental regulations
- c. Increased labour costs
- d. Increased raw material or other input costs
- e. Increased competition
- f. Changes in demand
- g. Introduction of new technology (including ICT)
- h. [only ask if APUB=2] Budgetary constraints

1. Yes
2. No

Section E: Establishment

Finally, I have a few general questions about your establishment.

ELAB

How does the labour productivity of your establishment compare with the productivity of [if APUB = 1] your competitors in your market? / [if APUB = 2] other organisations that provide a similar service in your country? Is your labour productivity:

1. Well above average?
2. Above average?
3. Average?
4. Below average?
5. Well below average?

EINNOVPRD

During the last two years has this establishment introduced any new or significantly improved products or services?

1. Yes
2. No

PRDMRKTa [only ask if EINNOVPRD=1]

Were any of these new products or services new to your market?

1. Yes
2. No

PRDMRKTb [only ask if EINNOVPRD=1]

Were any of these new products or services not new to your market but new to your establishment?

1. Yes
2. No

EINNOVPRC

During the last two years, has your establishment introduced any new or significantly improved processes, either for producing goods or supplying services?

1. Yes
2. No

EINNOVMRK

During the last two years, has your establishment introduced any new or significantly improved marketing methods?

1. Yes
2. No

EINNOVORG

During the last two years, has your establishment made significant organisational changes to your establishment? This can include new or changed business practices, methods of organising work responsibilities and decision making, or methods of organising relations with other firms.

1. Yes
2. No

EBASKET

Could you please briefly describe the most important organisational change introduced by your establishment over the last 2 years?

(description)

.....

.....

Record verbatim response
(interviewer note: code NOC if no organisational change over the last two years)

Final question:**JINFCNR**

Would you please provide your name and confirm your telephone number in case we need to re-contact you?

Name.....

JADMRECR

Would you give your consent to link the data collected through this survey to other statistical surveys?

1. Yes
2. No

Chapter IV

Measuring the dynamics of organisations and work: employee- level survey

Contributors

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I. Introduction

This chapter of the Guidelines proposes indicators and a questionnaire to measure work organisation, its evolution and outcomes at the employee level. It complements the analysis of the previous chapter which concentrated on the employer level. Some employees will be involved in the decision processes that bring about organisational change, and many more will witness the changes as they occur. All employees are affected in one way or another by work organisation and how it is changing.

Chapter I of the guidelines centred discussion on the areas of interest that an employee-level survey should focus on. After briefly revisiting the core objectives of the MEADOW project, and restating the concepts that are to be measured in the employee-level survey, this introduction will review the constraints, principles of item design and assumptions that the employee-level survey will face. Sections II and III of this chapter go through the concepts, including background demographics, and consider appropriate indicators in each case. The employee level questionnaire itself is included as an Appendix to the chapter.

Objectives

The objectives of the proposed survey are threefold: first, to capture employees' perspectives on organisational change; second, to collect data on both the job and the employee; and third to measure employee experiences and outcomes within the firm. By being able to gain and link information on both the employer and the employee one will be able to examine organisational change on the firm as a whole and within the firm itself. For example, an employee's perspective of organisational change will allow an analysis of just how successful a firm's perceived organisational change has been by looking at those who have experienced it. In addition, measuring the outcomes for employees of any organisational change will help researchers and policy analysts understand the impacts of change on European workers.

The aim of the employee survey is to combine measures of the contemporary experiences and perspectives (that is, at the time of the interview) with measures of change. To capture the changes, retrospective questions are proposed to be used alongside the longitudinal design of MEADOW overall. These questions are included in the survey where it is deemed appropriate to look at changes in variables rather than, or in addition to, levels.

Chapters I and II of the guidelines recommend that work practices and working conditions be examined at the employee level while organisational states and change are examined at the employer level. This allows for a complementary nature between the two questionnaires. Some aspects of the work experience that employees face will be seen as outcomes of the organisational state and any changes that are occurring. For example, worker well being. Other aspects, however, will be seen as measures of organisational design. For example, job autonomy or employee discretion can be seen

at both the employer and employee level by using different sets of questions. The same level of autonomy should be captured at both levels, and any discrepancy between the perspectives at employer level and employee level will be informative itself.

Summary of concepts for measurement

Figure I of Chapter I of the Guidelines sets out the measurement framework for the construction of both employer and employee level questionnaires. The figure shows how an organisation will function in a dynamic environment, from the external drivers that cause an organisation to change, to the organisational design, to the economic outcomes for the firm and the social outcomes for the employee. From the employees perspective, a questionnaire must capture their involvement as members of the organisation and the consequences that they face from working in the organisation. The basic measurement framework sets out the concepts that are to be examined in an employee-level survey questionnaire. Specifically, the concepts of interest for this chapter are: job control; job demands, including control, mental and physical demands of the job; (indirect and direct) employee participation; the quality of jobs; employee well being; pay and other intrinsic rewards; work intensification; and employee competence and skills. Each of these will be analysed in section II of this chapter.

Constraints

What constraints are there which must be acknowledged in the preparation of the employee level survey questionnaire? The first major constraint is that any survey will be restricted, not only by cost considerations, but also by the length of time. Respondents limit the time they are willing to give up to answer questions if the survey is completed in their leisure time or else it will take up the time of the employer if it is completed while they are working. Therefore, chapter II of the guidelines set an optimum time of 30 minutes for respondents to answer the questionnaire. It is assumed that the questionnaire will be administered by telephone, though the questions could be adapted for alternative delivery modes. Such a limited time span implies that we have had to be very selective in item design. This is not therefore intended as an in-depth survey. Rather, it is designed as a broad and cross-nationally applicable survey on how employees perceive and experience organisational changes in their workplace.

The second constraint is that the survey at the employee-level will be restricted solely to the respondents' knowledge of what is happening. Only what they are aware of and what happens around them with regard to organisational change will be within their purview when responding.

Principles for item design and selection

When constructing the employee questionnaire it is important to consider factors that will affect the item design. The first of these is international comparability – this survey if carried out would take place in many European countries and so the questions that appear in the questionnaire must be simple, objective and free of country-specific bias. A simple and objective harmonised questionnaire will allow international comparability.

The second principle for item design is that factual knowledge and behaviour-related and personal experience items are to be preferred where possible to items registering workers' subjective assessments, or their feelings and opinions about the organisation. For example, the questionnaire should ask whether they themselves have been appraised, rather than whether they thought that there was an appraisal system in the organisation; or, the questionnaire should ask about what respondents do, if anything, with computers, rather than if they think they are good at using computers. This is a good principle to follow in many survey design contexts; it is especially useful where maximum international comparability is the aim.

Supplementing these principles for item design, we have also adopted three criteria for the selection of indicators and items for inclusion, in the light of the space constraints noted above. The first principle is policy relevance. We believe that, especially where survey space is scarce, priority needs to be given to indicators that may be ultimately relevant for policy guidance for governments and more generally for the work of the social partners. A second criterion, related to policy relevance, is centrality in debate (as reviewed in chapter I). The third is feasibility of measurement within a limited interview time.

II. Concepts and indicators

In this section, we discuss possible indicators for capturing employees' perceptions of organisational change, and indicators which will characterise the employees' experiences that could be expected to be the outcomes of change. There is some overlap between these two objectives. For example, data about the extent of employee participation in decision-making will contribute both to researchers' understanding about organisational change and to their understanding about job quality. Indeed, the employee questionnaire will pick up both perspectives of organisational change and the implications of organisational change for them, in so much as it will affect them. Therefore, there is also a complementary relationship between the questionnaires at the employee level and the employer level. For example, questions on teamwork can be asked at both levels, and this will give different perspectives on how a team works from both the employer's and the employee's point of view. Of course, this is limited to areas where it is reasonable to assume that employees will have experienced some aspects of organisational change.

Before discussing the possible indicators for capturing employees' perspectives, it is useful first to set out the understanding of job quality indicators that informs the subsequent sections of the chapter. Unfortunately, there is no single agreed and validated definition of job quality in social science which can be picked off the shelf and applied in survey work. There are differences in emphasis and approach between economics, sociology and psychology; and even within disciplines there are a multitude of indicators, with conflicting conceptual bases, and usually requiring far too many items to be suitable for a multi-purpose international survey with limited interview time for each topic. So choices must be made and defended (Green, 2006).

First, job quality might be seen as a subjective concept, lying in the individual's subjective well-being. There is a range of domains of well-being across the different spheres of life, and in the context of this survey the relevant domain is that of work, and also the fit between work life and other parts of life. Therefore, it will be important in the survey to include indicators of well-being, and the closely-related concept of job satisfaction. However, many commentators would maintain that the subjective concept of job quality has shortcomings. It relies on an individualistic view of goal-seeking in the utilitarian tradition, and does not allow room for a notion of human needs satisfaction. From a practical point of view, responses to well-being questions are known to be considerably influenced by individual norms and expectations; so one can expect considerable divergence in employees' subjective responses even if objective work characteristics are the same for all. Since norms and expectations are affected by social environment, cultural factors may be expected to play a significant role when making international comparisons.

Consequently, we propose that indicators for worker well-being are included in the survey, but these must be seen alongside other indicators of objectively-conceived job quality. In this way, the relationship between objective and subjective job quality, and how it might vary across countries, is something that can be investigated by researchers, and not simply be assumed to be the same across all countries. The concept of worker well-being, together with associated indicators is discussed in section II.8 below.

An objective concept of job quality should be based, at least implicitly, on a theory of human needs at work (Green, 2006). It is likely to comprise both outcomes, such as the work rewards, and processes, such as the span of decision-making over which workers have influence. However, there is neither a single list of concepts that researchers have agreed upon, nor a ranking of importance of concepts. Below, we propose and defend several concepts for inclusion in the survey.

Our proposal for the employee questionnaire seeks to avoid a confusion that pervades some existing literature, in which the notion of job quality is broadened to encompass also the objectives of employing organisations. In the perspective drawn up for the purposes of the Lisbon agenda of striving for "more and better jobs", the concept of "quality in work" was developed, and several indicators have been proposed and monitored (European Commission, 2001, 2002). These indicators cover both aspects of the workers' experience that are related to human need, for example, intrinsic job quality, and aspects that are relevant primarily to their employers, for example productivity. Though productivity is expected to be related to the level of employees' wages, the association is far from perfect. From the perspective of MEADOW, the concept of productivity belongs to the sphere of the employer. The level of wages is not included among the indicators of "quality in work" which the Commission monitors, though recently the perspective on job quality has been broadened to include wages in the Commission's analyses (European Commission, 2008). The level of wages is a very important aspect of job quality, yet quite hard to measure well in a survey, even more so in a cross-national survey. Later, in section II.4, we propose a method of capturing wages directly, which will give a comparable banded measure of hourly wages. From the perspective of economists, not to include wages would seem very strange (Green, 2006).

While economics approaches job quality by emphasising the importance of indicators of wages and other forms of extrinsic material rewards, other social sciences also stress the importance of the intrinsic aspects of work. The two measurable aspects of intrinsic quality that have received most attention, both theoretical and empirical, are the extent to which people have autonomy at work (particularly over their own job), and the extent to which they are able to utilise and develop their skills. These features of work are quite often covered in large scale surveys about work behaviours or attitudes; an example is the European Survey on Working Conditions (ESWC). Both aspects are rooted in the view that humans are creative beings. Workers who have no autonomy in their jobs, and who are just following very detailed job descriptions, can become like robots. A chance to influence aspects of their work helps to satisfy the need to think about as well as to do work. Equally, employees have a need to be able to develop their potential to operate effectively in whatever sphere they are working. Those whose potential and skills are underused become alienated, and are likely to register low levels of well-being. For these fundamental reasons, we consider it essential that both skills utilisation and job autonomy/control are included in our list of indicators. Ultimately, the question at issue is whether organisational changes in the modern era are affording employees a fuller satisfaction of these fundamental needs, and how this varies across countries with very different labour market institutions. Job control is discussed in section II.3, while skills utilisation is taken up in section II.5.

Overall, in the light of these conceptual arguments and our principles and selection criteria noted above, the following eight concepts are included in the indicators to be described in sections II.2 through II.8: wages, employment security, working time, work-life balance, skills utilisation, job control, job demands, and employee participation and representation. The first four of these are extrinsic features; the remaining four are key intrinsic features. These objective aspects of job quality are to be measured as well as the subjective concept of work well-being, and the employees' perspective of organisational change. This selection means inevitably that some aspects of job quality are excluded, especially those concerned with the multiple facets of working conditions, or with qualitative features of job that are difficult to capture with survey instruments. The former are measured well in the ESWC, so the fact that they are to be poorly covered in the proposed MEADOW survey is perhaps less of a concern. For those wishing to map job quality across Europe, the ongoing ESWC will continue to be the obvious source of information. The intention here, however, will be to link organisational change with workers' experiences, including their job quality. To a considerable extent, we have used items from existing international surveys like the ESWC where suitable internationally validated items have been available for our purposes, though in many cases the items have had to be adapted for telephone delivery.

These concepts and indicators are developed into questions in the employee survey questionnaire, which is given as an appendix to the chapter. Box 1 presents the general structure of the questionnaire. Sections A through G of the questionnaire reflect concepts developed in sections II.2 through II.8. In the following, boxes will provide lists of indicators associated with each concept and the acronym of the corresponding questions which start with the section letter. For example, questions from the section on occupation will all start with an A. Of course, some questions can be related to

different concepts. They will only appear in one section of the questionnaire, but they can be referred to in different boxes. For instance, questions about training are relevant to measuring both HRM practice and skills utilisation. In the questionnaire, questions about training (DTRAINED, DTRAINTIME) are located in section D, but they are referred to in boxes 2 and 5 from section II.1 and in box 10 from section II.5.

Box 1: Structure of the employee survey questionnaire

Employee survey questionnaire sections		Chapter IV sections
Section A	Occupation	II.1
Section B	Work organisation	II.1
Section C	Participation and control	II.2, II.3
Section D	Skills utilisation	II.5
Section E	Working time and work-life balance	II.6
Section F	Employment security	II.7
Section G	Employee well being	II.8
Section H	Background demographics	III
Section I	Wage	II.4
Section J	Permission to return and administrative records	

II.1 Work Organisation and Types of Organisation

How work is organised, how the firm is structured and how the firm is changing its organisation will be crucial factors for this project that will be captured to a large extent in an employer-level survey. At the same time though, many indicators of work organisation and organisational change can be found at the employee level. Indeed, in many cases it will be the workers who are key in carrying out organisational change. Also some indicators of work organisation, for example indicators on coordination mechanisms, will be easier to capture at the employee level than at the employer level. In addition to this, views of work organisation and organisational change from the employee perspective can shed light on the reliability of the employers' measures and also their ability to communicate changes to the organisation to their workers.

1) Definition and rationale for survey inclusion

Management practices and techniques

Organisations are not only composed of people and objects, they also embed values and beliefs, knowledge and rules allowing managers to evaluate the way they perform and to orient behaviours and choices. Management practices and techniques are models of organised activity used by managers to rationalise actions they take in organisations. They contribute to shaping rules and methods of work.

Management practices and techniques are interesting from two standpoints. First, while they have proliferated, their use has progressively changed from the 1980s, from normative tools for collective action to analytic tools for building knowledge on the organisation. Moisdon (1997) identifies three different types of “modern” management practices and techniques: for investigating how organisations operate, for managing changes and for innovating. Thus, the implementation of new management techniques and practices are likely to be correlated with organisational changes. Second, managers have a discourse on management practices and techniques. They use it to communicate to stakeholders that organisations conform to their underlying rationale (Abrahamson and Fairchild, 1999). A caveat is that they follow fashion waves and they are periodically renewed, creating a semantic instability.

Chapter I has identified four management practices that form part of strategies for greater organisational flexibility and innovativeness and which are relevant for understanding the direction of organisational change: Human Resource Management (HRM) practices, Total Quality Management (TQM), lean production, and Knowledge Management (KM).

Organisational structure

The structure of an organisation is the product of its history. It is defined by the grouping of people and objects (like equipment or buildings) into sub-units, the systems to ensure coordination and integration of activities both horizontally and vertically within the boundaries of the organisation and outside these boundaries, with suppliers, customers and other business partners.

The prevalent designs of organisational structures or organisational forms have constantly evolved over time. From the mid-1800s to the late 1970s, organisations were seen as self contained within closed boundaries. The functional, divisional and matrix structures, now viewed as “traditional forms”, were spreading over that first period in large private corporations and in public settings (Chandler, 1962; Galbraith, 1973; Mintzberg, 1979). Decentralisation, horizontal organisational designs, with team and process based emphasis, developed in the 1980s until the mid-1990s. Internal boundaries of the organisation were reshaped in order to improve coordination and communication (Mintzberg, 1979; Chernes, 1976; Hammer and Champy, 1993). Since the mid-1990s, external and internal boundaries of organisations have opened up, resulting in a restructuring of value chains. The shape of networks relating business partners has become the critical element in organisational design (Domberger, 1998, Davidow and Malone, 2003, Anand and Daft, 2007).

A crucial issue with regard to organisational structure is whether standardisation or mutual adjustment is becoming more prevalent. Organisational change can also lead to increased costs of coordination.

Information and Communication Technologies

Information and Communication Technologies (ICTs) are tools (equipment or software) that are used to produce, process, transmit and store information. ICTs are part of the management practices and techniques used by employers to shape rules and methods of work.

Information used in firms has undergone major changes since the mid-1800s. Just a century ago, firms were in the midst of an information revolution that introduced many to the office machinery and equipment that dominated over the first half of the twentieth century “from telephones and typewriters to tabular forms, stencil duplicators and filing cabinets” (Yates, 1994). New machines and also new techniques for handling information were produced like the use of forms to gather data and the use of graphical techniques to display information. Currently we are in the midst of a new information revolution with the marketisation on new waves of equipment (hardware) and techniques for handling information (software). The new techniques for handling information are described in the methodological manual for statistics on the information society (Eurostat, 2006) and include: computers, networks, internal and external connections, portable phones are the “new” equipments; e-mail software, databases and integrated software (for example workflow management and supply chain management).

Yates (1994) reminds us that an information revolution is driven by three important forces: information demands of firms, connected with their structure evolution (Chandler, 1977), supply of technologies and techniques and managerial ideology. During the initial information revolution from the mid nineteenth century, the prevalent managerial ideology was a response to crises of coordination in growing firms. Yates labelled this ideology, after Litterer (1961), as “systematic management” which involved two types of activities: recording and rationalising knowledge previously embedded in individuals only and collecting and drawing operating information up the hierarchy and using it to compare and evaluate performance of individuals and of the organisation’s constitutive units.

The underlying ideology of the new information revolution does not break completely with “systematic management”, but structural forms have evolved, opening their internal and external boundaries, creating more complex networks of communication channels than the traditional hierarchical ones. As a result, it is increasingly difficult to characterise trends in the evolution of organisations connected with the use of ICTs. The last waves of ICTs appear flexible, able to adapt to the organisational perspective of managers and workers’ needs.

Types of organisations

Work organisation encompasses the division of work into tasks, the bundling of tasks into jobs, the interdependencies between workers in the job done, the grouping of workers into teams, the workload and work rhythm and the systems of decision rights, support and control over the work done.

According to the strand of literature that describes and discusses work organisation and developments in organisational design, emphasis is put either on the ways to improve employee performance or on the ways to improve employee well being. There are four ideal types of organisational designs that are captured in the survey. The first strand of literature tries to identify what makes a **high performance work system (HPWS)** (Becker and Huselid, 1998), while the second strand sees the work system as the building block of a healthy organisation (Guest, 1999; Wood, 2008).¹

¹ See chapter III for a definition of HPWS.

When describing organisational designs, the literature often refers to a list of workplace practices. In HPWS studies, emphasis will be on functional flexibility, team work, increased role breadth and suggestion schemes while studies on healthy organisations will focus more on job enrichment, employee involvement, autonomy, employee participation, competence development and information sharing.

A **flexible organisation** is able to alter the allocation of its resources in response to demand or supply variations. The term “flexibility” has various definitions. As pointed out in Huws (ed.) (2008), these definitions have arisen since the 1980s. During the 1960s and 1970s the term was used by womens’ organisations and trade unions to describe their demands for forms of work organisation which were more responsive to the needs of workers with responsibilities for caring for children or dependent adults, in order to achieve a better work-life balance. However, Huws (ed.) (2008) also indicates that flexibility can apply to: products, with the ability to produce products in short runs tailored to particular customer requirements, or to use the same workforce and machinery to make multiple products; production volume, with the ability to adjust the volume of production at short notice; organisation of the value chain (spatial flexibility), where there is the ability to transfer work from one location to another or to outsource/insource the activity; staffing levels (numerical flexibility); number of hours (flexibility of working time); work (work flexibility), which is the ability to adjust the work system through workplace practices like semi-autonomous teamwork and functional flexibility (for example two job rotation practices: multitasking versus multiskilling); and wages (wage flexibility), which is the ability to adjust wages both positively and negatively through workplace practices like profit sharing schemes or bonuses.

A **healthy work organisation** is able to foster employee development and to improve employee well being and working conditions. In particular, employees will be protected from detrimental effects connected with organisational changes. Two strands of literature emphasise healthy organisations: the first one puts the emphasis on labour relations (voice model), while the second one stems from work and organisation psychology and management science (Human Relations School; Sociotechnics, De Sitter 1981, 1994; Karasek and Theorell, 1990).

A **learning organisation** is an organisation where individuals learn as agents of the organisation and where the knowledge is stored in the organisation memory so that learning is also accomplished by the organisational system as a whole. Such an organisation is designed to be able to adapt continuously its means and people to changing requirements emerging from its environment or from its internal processes.

Organisational change

Organisational changes are the result of changes in organisational structure or in work organisation. These changes may or may not be directly intended by the employer and employees may or may not have direct influence on them. Organisational redesign results from employers’ decisions about organisational structure or work organisation, often implemented through the adoption of management practices and techniques deriving from new management concepts. Greenan and Mairesse (2006) observe that organisational redesign is strongly connected with a higher intensity of meetings reflect-

ing the coordination cost of organisational change. The nature of interactions between employers and employees around the process of organisational changes plays a critical role in stimulating economic and social performance and can be usefully captured at the employee level.

2) Factors relevant to the choice of indicators

Management techniques and practices

Most management practices can be best examined in the employer questionnaire, like just-in-time production and other logistic principles, customer orientation or value chain orientation. However, the employee questionnaire may be used to capture the perception of employees about whether and how specific work methods which are described as part of a given management concept are applied in the workplace. For example, employees can describe their experience of performance appraisals which are a HRM practice or indicate whether they are involved in problem-solving or service-improvement groups which are part of TQM. Employees may also give information about areas of work that are interesting to relate with a given practice identified in the employer level questionnaire. For instance, lean practices should have some consequences for job demand and job control.

Organisational structure

When looking at organisational structure it is necessary to identify both the grouping of people and objects and the levels of coordination and integration. There are some caveats that must be borne in mind when looking at coordination mechanisms. Chapter I of the guidelines outlined Mintzberg’s (1979) five coordination mechanisms: direct supervision; standardisation of work; standardisation of outputs; standardisation of skills; and mutual adjustment.

However, the work of Mintzberg does not take into account that computers and ICTs have come into the workplace on a wide scale and now play a role in coordination. Paying attention to this is also relevant, for example because it can be stress producing among workers (McGovern, Hill, Mills and White, 2007). Moreover, the principle of ‘management by trust’ (cf. Mishra, 1993; Spreitzer and Mishra, 1999) is another coordination principle that is not accounted for in the work of Mintzberg. Such coordination can be assumed to become more and more relevant, for example in relation to innovative performance. Lastly, the combination of coordination principles is also interesting to capture. For instance, workers may exercise some autonomy with a view to discovering new, more efficient, ways of performing their jobs. Subsequently, these ideas may be the basis on which tasks become standardised. Van Hootegem (2000) describes it as ‘autonomation’ (autonomy plus standardisation).

Information and Communication Technologies

In employer level surveys it is easy to capture the type of equipment, hardware and software adopted by the organisation. Employees can deliver complementary information about their use of ICT, for example, the time they spend using a computer or whether they are able to access the company’s IT system when working away from the

employer's premises. They can also give some information about how ICT is used at the workplace, for example, whether the tasks they perform are recorded by a computerised system.

Types of organisation

HPWS is best measured at the employer level. The employer survey developed by Bloom and Van Reenen (2007) and the literature review by de Waal (2006) focuses on HPWS. However, the employee survey can be used to relate characteristics of the organisational design described by the employee with HPWS indicators from the employer. Additionally, specific questions could be designed for employees in a management position.

For the flexible organisation, product, production, spatial and numerical flexibility are better captured at the employer rather than at the employee level. Indicators for work flexibility relate with organisational design indicators, while indicators of wage flexibility also pertain to the category of HRM workplace practices and wages (see section II.4). Finally, working time flexibility relates to work-life balance particularly (see section II.6).

As with the flexible organisation, the employee level indicators of healthy work organisation are a combination of already mentioned indicators or indicators covered elsewhere in the chapter: employee participation (see section II.2 of this chapter); job control and job demands (II.3); job quality (II.6-II.7); and worker well being (II.8).

Indicators for learning organisations are covered by work organisation indicators as well as indicators about participation (section II.2) and about skills utilisation (section II.5).

3) Proposed indicators

Management practices and techniques

The four management practices and techniques that are covered in the core employee level questionnaire are HRM, TQM, lean production and Knowledge Management. The proposed indicators for management techniques and practices that are included in the survey are outlined in Box 2. In all cases, these indicators pertain to the employee's perceptions about the area of interest.

Box 2 : Indicators for management techniques and practices

Indicators		Chapter IV sections
HRM indicators	Type of contract	ACONTRACT, AFULLTIME
	Seniority in the company, on the work post	AJOBTENURE
	Perception about job security	FLOSEJOB, FGETNEWJOB, BJOBRISK
	Formal and informal training	DTRAINED, DTRAINTIME
	Performance appraisal/evaluation scheme	CAPPRAIS, CAPPRES
	Flexible or contingent component in wages	EOVERTIME, IREMU
	Fringe benefits	HCHILD CARE
	Organisational commitment	CJOBLIKE
TQM indicators	Quality assessment and monitoring	BQUALMON
	Participation in problem solving groups	BCIRCLE
	Continuous Improvement Process	DINNOVBEH
Lean production	High levels of work effort	BWEFFORT
	Influence of the customer on the pace of work	BWORKPRES
	Job rotation	BJOBROT
Knowledge Management	Learning new things in work	DLRNEW, DHELPWORKER
	Problem solving	DPROBSOLVE
	Continuous Improvement Process	DINNOVBEH
	Central database	BDATABASE

Organisational structure

The first set of proposed indicators looks to identify the position of the employee in the structure of the organisation (see box 3). It is very important to understand the occupation that the employee has. This must be described fully using an internationally accepted scale (see section III of this chapter).

Organisational changes in the modern economy mean that more and more workers are working at places away from their employer's premises. It is important to know how much time they spend away from their employer's premises, and how this has changed over time as the organisation changes. Use of a computer and access to a company IT system are also areas of interest that are to be examined in this survey (see indicators on types of ICT use below).

The position of the employee within the establishment can be assessed according to their level of authority over other workers. Formal authority over other workers is examined directly in the survey as well as described by respondents when describing the kind of work they do for coding their occupation.

Respondents will also have some level of authority above them in many cases and so this needs to be examined. Again, this should be found in the description of the worker of their own occupation, but also included in the survey are questions about the ability of a manager or supervisor to affect the pace at which they work, to assess the quality of work, and if a manager or supervisor offers assistance to the worker.

Knowing how the establishment is organised will also involve knowing if workers work on their own or work with other employees within the organisation. Questions are to be included in the survey which ask if the respondent ever works in a group, where the other people in the group come from (within the organisation, outside the organisation or a combination of both), and what decisions the others in the group can influence.

Organisational changes may also lead to more work with other firms, and as such groups may be set up with workers from these other firms. Organisational change may also lead to employees dealing with work outside of their normal work hours.

For indicators of coordination and integration, it is proposed that we use indicators similar to the European Working Conditions Survey (EWCS). The EWCS focuses its measurement of coordination on dependencies in one's pace of work on:

- the work done by colleagues
- direct demands from people
- numerical production targets or performance targets
- the direct control of a superior
- the automatic speed of a machine or movement of a product

The direct control of a superior is an indicator of direct supervision. Standardisation of work can be seized through the dependence of the work pace on colleagues or machines. Standardisation of output can be captured through the productive target item and through questions on quality standards, focusing on whom or what monitors the quality of work. In the EWCS, standardisation of work is also captured through questions on repetitive or monotonous tasks but because of the time constraint with this survey it is not included. The survey also includes a measure of computerised control of work (see section on ICT indicators below).

Mutual adjustment is examined by questions on assistance and support from other employees (see proposed indicators of work assistance in section II.3). It is also examined by looking at the employee's own influence. These measures capture dimensions of the work systems. For example, they can be used as a base for measuring work intensification. The standardisation of skills is not easy to capture.

As outlined earlier in the section, organisational changes can increase coordination costs. Meetings are a good indicator of these costs (see section II.2 of this chapter).

Moreover, coordination mechanisms involve more and more written forms as well as the use of other languages in a context of globalisation, and this can also be an indicator of coordination costs.

Box 3: Indicators for organisational structure

Indicators	Survey questions
Occupation	AOCCUPATION
Places of work	BWAWAY, BCHGWAWAY
Formal/informal authority over other employees	BSUPERVISE
Formal/informal authority of employees over respondent	BQUALMONb, BWORKPRESb, BWRKASSISa
Isolated work and regular work with other employees	BWRKGROUP, BGROUPCHG
Regular work with people outside the firm	BWRKGROUPa
Standardisation	BWORKPRES, BQUALMON, BTARGETS, BSTANDARDSCHG
Mutual adjustment	BWRKASSIS, CAUT, DHELPWORKER
Coordination and integration	BWORKPRES, CMANMEET, BDATABASE
Coordination costs	CMEETCHG, BFORLANG

Information and Communication Technologies

Organisational change should involve increased levels of ICT use within firms, so it is important to include indicators of ICT within the employee survey. However, due to the time constraint that this survey faces, many of the things that could be examined at the employee level must be left out (see box 4).

The indicators selected for measuring ICTs include looking at employee's use of a computer, how often they use it and to what level of skill is their computer use in their job (see proposed indicator on use of computer skill in section II.5).

Do the employees have access to a central database? Do they use a computer when they are working away from their organisation's premises and can they access an organisation's ICT systems when working away from the organisation's premises (see also the proposed indicator of on places of work in section II.1)? What type of hardware and other forms of software use cannot be included because of the timing issues previously mentioned but these indicators could be developed in a module of the core questionnaire.

Finally, do computers track an employee's performance? Is this information, which is recorded on the system, used to check how they are performing in their job?

Box 4: Indicators for Information and Communication Technologies

Indicators	Survey questions
Computer use	BUSECOMP, BCOMPTIME
Self assessment of computer skills	BCOMPLVL
Types of ICT use	BDATABASE, BWORKPRES, BAWAYb-c
Change in ICT use	BCHGCOMPTIME
ICT monitoring	BTASKREC

Types of organisation

The proposed employee level indicators for organisational design are shown in box 5. The job rotation indicator will look at the functional flexibility of the organisation. The groupwork indicator will look at whether the employee is involved in working with groups or teams, and at what things a group can influence, for example what tasks it is to do and who is to join the group? (See proposed indicator on isolated work earlier in section II.1)

In addition, task complexity, skill development (see section II.5), job demands and workload (see section II.3) and job control and autonomy (see section II.3) are also indicators of the organisation of work that are included in the employee survey but are discussed elsewhere in this chapter.

At the employee level, indicators for HPWS include performance targets, incentives and tracking, as well as whether an employee has access to information about the organisation and their ability to express views about the organisation.

As outlined earlier in section II.1 the proposed indicators for flexible organisation and healthy work organisation are covered elsewhere in this chapter or else are better captured at the employer level. Indicators for the learning organisation at the employee level are discussed elsewhere in the chapter: learning new things, and helping others to learn; formal and informal training; assistance and social support; access to information; participation in problem solving groups, brainstorming or suggestion schemes; and Continuous Improvement Process and innovative work behaviour.

Box 5: Indicators for types of organisation

Indicators	Survey questions
Job rotation	BJOBROT
Groupwork	BWRKGROUP
Task complexity	BPROBSOLVE,
Skill development	DLRNNEW, DTRAINED, DTRAIINTIME
Job demands and workload	BWEFFORT, BWORKPRES
Job control and autonomy	CAUTC, CAUTS, CAUTU, CAUTH
Setting of performance targets	BTARGET
Performance incentives	IREMUN
Performance tracking and tracking feed-backs	BTASKREC, CAPPRAISE, CAPPRES
Access to information about organisation	CMANMEET, BINVOLVE
Ability to express views about organisation	CMEETVIEWS, CEXPVIEWS, CMEE-TIMPACT

Measurement of changes in work organisation

A selection of core work organisation indicators are expressed both in level and in terms of perceived change over the two-year period chosen in the general survey framework presented in Chapter II of the Guidelines. Areas covered are given in box 6: amount of time spent in teams, difficulty to meet targets, frequency of high intensity work, time spent away from the employer's premises, time spent using a computer, time spent in meetings and change in skill requirement. This will help to better trace trends in employees' work experience. Moreover, the linked survey structure will allow relating these trends to organisational change measured at the employer level. A one-year follow up wave of the employee survey with a panel design is also proposed in the general survey framework. This second wave of the employee level survey would allow going further into the measurement and analysis of trends in employees' work experience. It would also contribute to the analysis of the adaptation process of employees when employers implement organisational changes.

Another set of questions contribute to a general assessment of organisational change from an employee perspective. They conclude section B of the questionnaire. In a first question, the employee is asked whether the following changes have taken place in the workplace: implementation of new or significantly changed machines, techniques or ICT systems, relocation of employees, implementation of a new or significant change in the method of work and introduction of a new or significantly changed product or service. Next, the strength of the impact of the change on the employee's tasks and duties is assessed. After that, the employee is asked whether he/she values these consequences positively or negatively, whether his/her feeling of job insecurity is affected and what the

involvement in the change process was like.

Box 6: Indicators of changes in work organisation

Indicators	Survey questions
Change in the amount of time spent working in teams	BGROUPCHG
Change in the difficulty to meet targets	BSTANDARDSCHG
Change in frequency of work to tight deadlines or at very high speed	BCHGWEFFORT
Change in the amount of time spent working at places other than employer's premises	BCHGWAWAY
Change in the amount of time spent using a computer	BCHGCOMPTIME
Change in the amount of time spent in meetings	CMEETCHG
Change in the skill needed to do the current job	DSKILLCHG
Perception of changes that have occurred at the workplace	BCHANGES
Impact of these changes on tasks and duties	BCHANGESb
Point of view about the consequences of changes	BCHANGESc, BJOBTRISK
Involvement in the change process	BINVOLVEa-e, BINVOLVEsAT

II.2 Employee Participation and Representation

1) Definition and rationale for survey inclusion

Employee participation is an important form of labour relations in contexts of innovation and organisational change. Social dialogue is playing a key role in the establishment of the European social and economic space. Social dialogue is taking place in the form of labour relations systems (LRS)² that are usually defined as *“the multi-level framework relating employees and their organizations with employing enterprises and their organizations.”* (Müller- Jentsch: 1997, quoted by Höland: 2007). In the last 10-15 years it can be argued that labour relations have become less regulated and more unstable and flexible. This is the result of the wider process of decentralisation in which the transfer of organisational and entrepreneurial power is moving downwards from the enterprise or enterprise groups to smaller units. As Höland puts it: *“The increase in flexibility and adaptability of market conditions on enterprises, and the decrease in transactions costs have contributed to the managerial approach of reducing the importance of central decision making instead favouring greater decision making at the smaller unit level”*³.

² The term ‘industrial relations’ is used almost exclusively in the literature. Contrary to this practice, we intend to use ‘labour relations’. In our view, the term of ‘labour relations’ is more general and it indicates the growing importance of the idea and practice of social partnership not only in the field of traditional industrial economic activities but in the service sector and especially in the fast growing branches of the New Economy.

³ Höland, *ibid.*, p. 171.

However, this argument is not necessarily verified empirically, and so in considering an employee survey one must make sure that there are a balanced set of variables that can both capture decentralisation and centralisation so as to challenge whether which view is correct.

Employee participation is also crucial for innovation and organisational change. Nielsen (2001) argues that employee involvement and participation play a key role in mobilising the organisational knowledge that is the so-called “embedded competence which rely on the ability of the human assets continuously to learn and develop knowledge as a collective resource, as well as power to make use of and get through with new knowledge and ideas in the organization”⁴. This is especially important in the situation of organisational change when the appropriate knowledge flow is crucial in handling growing internal and external uncertainties.

Also important for workers is the influence they can achieve over their managers. Traditionally, this was achieved through trade unions, providing wage bargaining representation and a way for employees to voice any issues that they had with their work. However, there has been a large decline in union coverage in several countries over the last twenty years. There is evidence that other types of communication with management have grown and may have taken the place of unions in providing workers with a ‘voice’ (e.g. Millward et al., 2000). This may take the form of work committees, regular meetings to consult with workers, regular meetings to inform workers or suggestion schemes (Green, 2006).

Not surprisingly, there is a plethora of definitions on employee participation. Many of them (see for example Heller et al., 1998; Poutsma, 2001) agree that participation is a group process in which employees and their employers take part. For the purposes of the MEADOW project the definition of participation adopted by Heller et al. is simple and objective: *“Participation is a process which allows employees to exert some influence over their work, over the conditions under which they work and over the results of their work”*⁵.

There are seven axes along which MEADOW will investigate employee participation, each of which will briefly be discussed. The seven axes investigated are:

- The form(s) it may take involving individual(s) or collectives
- The issues it may deal with
- The timing of employees’ involvement
- The influence employees may exert through the forms of participation
- Permanency
- Independence
- Facilitation

⁴ Nielsen, 2001, p. 34.

⁵ Poutsma, 2001, p.5.

Poutsma (2001) distinguishes “four basic pillars” that employee participation within organisations may take. These are: direct participation, where an employee can influence work related issues on a daily basis; indirect or representative participation, where an employee has an indirect influence on work related matters through their employee representatives; financial participation, where an employee can participate in effectiveness of the enterprise through profit sharing for example; and collective bargaining, where different groups within the organisation will attempt to influence labour conditions within the company or even the sector of employment.

What issues will employee participation look to solve? The issues can be put into four broad categories : task-related issues (day to day challenges and improvements to the processes or the tasks that an employee faces for example); working conditions (improvements to the day-to-day surroundings and tasks an employee faces, the wage they receive for example); employment practices (training issues for example); and strategic issues (selecting managers, major investment decisions for example).

Nielsen and Lundvall (2007) distinguish between three phases of employee participation: the idea phase, decision phase and implementation phase. The idea phase is where employees are involved in the search for the solution to a problem, the decision phase is where employees are involved in deciding between different possible solutions, and the implementation phase is where employees cooperate in determining how the solution is to be implemented.

How much influence will an employee exert through their participation on the organisation? Interestingly the employees and employer could easily see this from different point of views.

How permanent is the participation? Some forms of participation may be temporary, lasting for only a short period of time (for example a working group convened to discuss impending redundancies), whilst other forms of participation may be more permanent (for example a permanent staff consultative committee).

How independent is the participation of the employee? Many forms of participation are employer initiated or exist only as long as the employer deems them to be useful (for example many forms of direct participation). Others (such as trade union forms of participation) have a level of independence and are not generally subject to an employer's control.

Finally, how is participation facilitated by the organisation? Does the employer embrace the existence of staff associations or do they try and work against it? Does the employer encourage staff to become members of a trade union or do they discourage it?

2) Factors relevant to the choice of indicators

Some issues about employee participation are going to be difficult to approach in an employee survey. One key factor with employee participation is that the level of influence depends on different forms and institutions of participation. Furthermore, the

legal framework in each country is important, too. Hence, the level of influence may be measured by observing the form of employee participation and the actual involvement of employees at the workplace. Additionally, the permanency and independence of employee participation is obviously also dependent on the same factors.

Additionally, when considering a randomly chosen employee it is very unlikely that they will be able to know all the issues that are currently being discussed or are to be raised with the employers by any employee representatives. What a respondent will know is their own participation in issues such as those discussed in the previous section. Therefore, many of the areas of participation, such as the existence of trade unions and the existence of collective agreements, will be better analysed at the employer level.

It will also prove difficult to look at any financial participation as this will also mean that the question is asking about wages. If too many questions are asked about wages this may put off respondents and deter them from answering the questions correctly.

In terms of European comparison, one must be very careful with the type of questions that are asked. For example when considering trade union membership it may be that union membership does not have the same meaning in one country as in another. For example, in France nearly all employees are covered by a branch level collective bargaining agreement whether or not they are a union member. These remarks also remain true for employee representation.

3) Proposed indicators

Membership of a trade union or staff association can be examined at the employee level (see box 7). Existence of these institutions cannot be examined at this level as not all employees will know of their existence. Additionally, organisational change may lead to changes in the level of union membership or staff associations, so the survey needs to find out if their membership is longstanding or not.

The survey can examine the direct participation of the employee on their daily work tasks. (See proposed indicator on freedom to make decisions in section II.3 below)

As mentioned in the previous section, employees are asked retrospectively about their views on the changes that have occurred in the workplace over the past two years. When changes are identified, the survey asks employees about how they have been involved in the process of change: Did they personally take part in deciding them or negotiating them? Was a trade union or work council involved? Have they been personally consulted or informed before the changes were introduced? Are they satisfied with their level of involvement in decisions about the changes?

The involvement of employees at the workplace through meetings is also generally assessed in the survey, to identify participation around current topics of working life. Are they involved in meetings that inform them about changes to the organisation, are they involved in meetings where they can express their views over the changes that are going to take place, and if so, what areas of the organisation can they express their

views on? Involvement of all employees at the establishment can be examined at the employer level. Organisational change may also involve changes in the level of meetings that employees attend, and so the survey needs to include a measure of whether or not the level of meetings has increased or decreased over the past two years.

While the existence of a performance appraisal system and of any type of incentive pay or profit sharing is best examined at the employer level, it is useful to investigate how it translates at the employee level. Does the pay of the employee include flexible parts? Has the employee had a performance appraisal in the last year? How does this appraisal affect her/his prospects on pay, promotion or training?

Box 7: Indicators for employee participation and representation

Indicators	Survey questions
Membership of trade union or staff association	CUNIONMEM
Change in trade union membership or staff association	CUNIONMEML
Participation in decision making regarding own duties	CAUT
Involvement in the decisions about change	BINVOLVE, BINVOTESAT
Involvement of employee through meetings	CMANMEET, CMEETVIEWS, CEXPVIEWS, CMEETIMPACT
Change in involvement level of employee through meetings	CMEETCHG
Use of incentive pay schemes and/or profit sharing	IREMUN
Involvement in performance appraisal	CAPPRAISE, CAPPRES

II.3 Job Control and Job Demands

1) Definition and rationale for survey inclusion

Job demands and job control are two dimensions of the working situation that will have an impact on the well-being of employees. Job demands look at the tasks that need to be completed and in what time frame, and is often referred to as 'work load'. Job control looks at the amount of decision making a person has in the work he/she does in a given working day, which is referred to as 'decision authority', and the ability to use and possibly improve his/her skills set at the same time, which is referred to as 'skill discretion'. So a given person will find his/her well-being depending on his/her in which there will be a certain job demands and a certain level of job control. Together, job demands and job control provide an assessment of the quality of the job content *not of the quality of working life*.

Both job demands and job control can be looked at using different models. An example that looks at both is the widely used and validated 'Karasek's JDC model'. This model states that in the work situation a number of stress inducing circumstances occur that can be reduced to two basic dimensions, namely job demands and job control (JDC).

Karasek's JDC model states that the greatest risk to physical and mental health from stress occurs to workers facing high psychological workload demands or pressures combined with low control or decision latitude in meeting those demands. In addition, the model contains important predictions regarding the socialisation of personality traits and behaviour patterns which occurs at work. Chronic adaptation to low control-low demand situations can result in reduced ability to solve problems or tackle challenges, and feelings of depression, or 'learned helplessness'. Conversely, when high job demands are matched with greater authority and skill use, more active learning and greater internal locus of control develop. This can enable individuals to develop a broader range of coping strategies. As such, the model provides a justification and a public health foundation for efforts to achieve greater worker autonomy as well as increased workplace democracy.

The JDC model is especially useful for looking at organisational change as it allows the creation of a link between the subjective perception of employees (the psychosocial perspective that can be asked in an employee questionnaire) and the objective work situation (the organisational perspective that emerges from the organisation questionnaire (see chapter III)). The model relates the psychosocial load to work characteristics as workload and possibilities for control. These work characteristics, however, do not just happen to be as they are. They are determined by the way work is organised in companies and offices. In other words, they are determined by the structure of the division of labour in the organisation. When this structure leads to a job design in which the employee is continuously confronted with problems, while at the same time the job design is such that it does not offer the possibilities for control to tackle these problems, then stress risks are present.

The JDC model has been extended by Johnson and Hall (1988) to include a third factor, the beneficial effects of workplace social support. The way in which jobs allow employees to support one another or receive support from superiors will influence the extent to which stress risks will eventually lead to stress. Therefore, the Karasek-model is often referred to as the Job Demands-Control-Support (JCDS) model. In this model the lack of social support combines with job strain to increase the likelihood of stress-related conditions.

One of the major inconsistencies in the JDC model (and hence the JCDS model as well) is the inclusion of 'skill use' which makes a comparison between the job (required qualifications) and the employee (available qualifications). Although the model focuses on objective constraints on action in the work environment, here a person-environment fit perspective is introduced. While it is important that the design of the job is such that it offers learning opportunities during work, the matching with the employee concerned is sometimes left out in order to maintain a purely structural approach.

Another option that therefore could be used is the Effort-Reward Imbalance (ERI) model as developed by Siegrist (1996) that was discussed in chapter I of the Guidelines. This model adds a personal component to the Karasek model. The ERI approaches job demands and job controls by integrating personal characteristics as an intervening factor. The worker exerts effort (job demands and obligations) in accordance to the

rewards (wage, salary, esteem, career mobility and job security) expected. An imbalance in the two may occur and even be maintained under three conditions: a state of dependence (no alternative), a strategic choice (investment for future), or an overcommitment by the worker.

2) Factors relevant to the choice of indicators

The first proposed indicator to use for job demand and job control is the copyrighted Job Content Questionnaire (JCQ). The JCQ is a questionnaire-based instrument designed to measure the 'content' of a respondent's work tasks in a general manner which is applicable to all jobs and jobholders. The best-known scales are decision latitude and psychological demands used to measure the job strain model. The JCQ has been translated into over 22 languages.

The Job Content Questionnaire (JCQ) is copyrighted. Users must request the instrument from the JCQ Center. The JCQ is provided with research documentation to most users free of charge, but commercial and very large research projects pay a usage fee to support comparative reliability analysis and instrument development on a non-profit basis through the JCQ Center.

A second issue is that of the length of the questionnaire. The length of the full scale JCQ is far too long for the purposes of this survey and the measures of the ERI model involve at least 40 items and so this could not be fully examined in this survey. Therefore, only a selection of measures on job demands and job control are used in this survey.

3) Proposed indicators

Job demands will be examined using three items, the first of which is working to tight deadlines or at high speed (see box 8). Here, a percentage scale is used to identify how often an employee has to work to deadlines or at speed. The scale used is: up to 25% of the time, 25% to 50% of the time, 50% to 75% of the time, or 75% or more of the time.

An additional issue relating to this is whether or not employees feels that they have to work to tight deadlines or at high speed more often than they did in the past, and this is also included in the survey to examine if organisational change is leading to increased job demands.

A major issue with job demands is if an employee faces conflicting demands. This is examined for the employees by asking if they have targets that are related to both quantity (turnover, number of customers served) and quality (percent of defaults, customer satisfaction) and how often they can meet both these targets.

A measure of decision latitude is skill discretion, which includes the ability to learn new things in a job. Employees are again asked how often their job involves learning new things, with the same four point scale.

How much skill is required to perform the job can be examined using the employees' report of what level of education would be required to get the job today (See proposed indicator on level of educational achievement required for a job in section II.5).

Skill discretion involves being able to perform various different tasks in a job, and this is captured in this survey by examining how often individuals can change the content of the tasks in their job, using the four point scale outlined above.

A lack of skill discretion will mean that the tasks involved in a job are very repetitive. Within the survey this is not examined directly. Instead this is measured through questions about how often an employee can alter the order in which they do their tasks; whether an employee's tasks are recorded on a computerised system; and whether the pace of the employee's work is determined by computer or machine or assembly line. Individuals whose job is repetitive in nature are more likely to be working on an assembly line, having their work monitored by a computerised system, and they will not be able to alter the order of their tasks very often if at all.

Decision latitude is also measured by decision authority, and the measures of decision authority are employees' ability to: make their own decisions in their job; choose how they perform their tasks; have a lot of say in their job. This is measured using four questions on how often the employee has the ability to alter the content of their work, the speed at which they work, the order in which they undertake tasks and how they undertake tasks.

Finally, to look at the support part of the JCDS model, work-related social support is examined by asking if the employee ever feels the need for assistance, and then asking if he/she receives assistance from their managers and co-workers.

Box 8: Indicators for Job Control and Job Demands

Indicators	Survey questions
Working to tight deadlines or at speed	BWEFFORT
Change in working to tight deadlines or at speed	BCHGWEFFORT
Conflicting demands	BTARGETc
Learning new things	BDLRNNEW, DHELPWORKER
Job requires high skills	DEDGETJOB, DEDDOJOB
Task variety	CAUTC
Repetitiveness of tasks	CAUTU, BTASKREC, BWORKPRES,
Freedom to make decisions	CAUTC, CAUTS, CAUTU, CAUTH
Work assistance	BWORKASSIS, BWRKASSISa-b

11.4 Wages

1) Definition and rationale for survey inclusion

The wage is the monetary remuneration that an employee receives from their employer in return for the use of the employee's labour as a factor of production. The employee's labour supply is typically measured in hours. The hourly wage then provides a measure of the monetary reward for the supply of one unit of labour. Total remuneration is the monetary wage paid to the employee plus other forms of employee remuneration such as employers' pension contributions, health insurance payments and benefits in kind.

Wages form a central part of any employment relationship. For employers, the wage is the cost of securing the worker's productive capacity, and often accounts for a significant share of total costs. For most employees, the wage is the primary form of compensation that they receive in return for their labour, and is usually their principal source of income.

In the context of organisational change, high labour costs may serve as the prompt for an employer to alter certain aspects of the production system. This may occur by the employer either substituting capital for labour, substituting high-cost labour for lower cost labour of the same ability (e.g. through off-shoring) or seeking to increase the productivity of existing workers through the re-organisation of working methods (see Forth and O'Mahony, 2003, for a discussion). From an employee perspective, high wages may serve as a motivation to resist organisational change if that change may offer some risk of job loss. Employees may also seek to secure wage increases as a form of compensation for reorganising their working methods (Bryson et al., 2005), particularly if the new working arrangements are to require greater levels of effort.

More broadly, payment systems are an important aspect of theories of HR innovation, since wages are accepted as a key motivating factor for employees. This is seen in the theory of efficiency wages (Akerlof, 1982, 1984; Akerlof and Yellen, 1990), in which increases in wages are argued to have the potential to elicit increases in worker productivity, and in approaches to contingent pay, in which greater effort is induced by establishing a direct link between output and reward.

Wages also have a value in serving as a proxy for overall job quality, since higher wages tend to be positively correlated with better non-wage terms (e.g. redundancy payments) and good working conditions (see, for example, Dale-Olsen, 2006). On the other hand, the theory of compensating wage differentials suggests that some jobs offer high wages because they are particularly physically taxing or dangerous (Smith, 1982). Equally, some low-paid jobs offer considerable job security, hours flexibility, job autonomy and so on. The level of the wage should also not be taken in isolation from its social context. An employee's degree of satisfaction with their wage is positively associated with their wage rank within the workplace (Brown et al., 2005). In other words, wage differentials are important to employees as well as the actual level of wages.

Given these various issues, a survey that seeks to investigate 'the economic and social impacts of organisational change' ought naturally to have some interest in the following: wage levels; wage inequality; wage dynamics; the composition of wages; and total remuneration.

2) Factors relevant to the choice of indicators

What are the factors that will affect the choice of indicators? The first issue concerns pinning down exactly the concept to ask about. For example, the difference between the monetary wage and total remuneration is often ignored in survey enquiries (and thus in data analysis) because of the greater difficulties of measuring the latter. However, the difference between the two may not be trivial. What is more, the proportion of total remuneration accounted for by the monetary wage differs across sub-groups of the population, typically being lower for men than women (Joshi and Paci, 1998; Anderson et al., 2001) and lower for higher-skilled workers, while it would also likely differ across countries due to differences in work-based pensions and different health insurance systems for example.

Total labour costs may be of interest, since organisational change may involve additional recruitment costs or training costs. However, in the context of the employee, one would ideally wish to measure *total remuneration*. As indicated above, surveys of individuals typically do not seek to measure total remuneration because the non-wage components are often not well known by employees. For instance, an employee's pay slip will not list his/her employers' pension contributions or social security payments. Some surveys address this problem by additionally asking employees whether they receive certain non-wage benefits, for example asking the employees whether their employer makes pension contributions or pays for private medical insurance on their behalf. However, such measures are of only limited use without any associated valuations.⁶ Accordingly, surveys of individuals typically seek to measure the *wage*.

The average wage per hour ideally should take into account their usual hours, any overtime they work which is paid, any pay that is unrelated to hours of work (for example tips, clothing allowances) and any unpaid work they may undertake. However, when trying to find out an individual's average wage by asking for it directly there will be three reasons why individuals may not answer the question accurately :

- They know their overall earnings and their overall hours of work but are unable to accurately divide one by the other
- They know their earnings and hours of work and have the ability to do the maths but are unwilling to expend the effort
- They do not know one of either their earnings or their hours of work.

Therefore, to remove any potential non-response because of the first or second reason, it is usually best to ask for earnings and hours of work separately. Indeed, one probably wishes to measure hours of work independently anyway, in order to provide one indicator of effort.

The second major question that affects the choice of indicator is whom to ask, given that both employees and employers are usually party to information about an individual

⁶ For instance, employers' pension contributions in the UK can vary between 1% and 20% of an employees' gross pay depending upon the employer.

employee's wage. Wages are also sometimes recorded in administrative data sources. Typically, the various sources do not tend to provide the same value (see Bound *et al.*, 2001, pp. 3748-3765 for a review of validation studies). For instance, an employee is less likely than his/her employer to refer to records when asked about their wage, and this necessarily offers more scope for recall errors and rounding. On the other hand, employers are likely to be aware only of paid hours, and in that case would understate the overall hours of work and so over-state the wage when compared with an accurate employee report⁷.

More broadly, however, employers are likely to have significant concerns about data protection if asked to report the wage of a named employee, unless the request comes as part of a mandatory government survey. And the availability of wage data from administrative sources is likely to be uneven and also to involve considerable barriers to access. Accordingly, it is most likely that the measure of wages would be obtained from the employee. The employer may, nonetheless, be a willing and valuable informant on the distribution of wages at the establishment, thus providing a measure of wage inequality.

3) Proposed indicators

Given the preceding discussion, the proposed indicator is the hourly wage of respondents. To do this it will be necessary to have both their salary and their hours of work so as to gain their hourly wage.

However, when asking about wages to individual respondents there are additional issues that have to be addressed that are associated with the measurement of the wage and overall hours of work. First, one would ideally wish to measure the wage gross of any taxes or other deductions, since the level of such taxes may differ for reasons unrelated to the wage/effort bargain, for example family circumstances or levels of non-work income. Some respondents may only know net wage and, in this case, a questionnaire may accept net wage rather than register no response. The estimation of gross wage is necessarily fraught with error in such cases, but may result in less measurement error overall than if the case is to be excluded from any analysis.

Second, what period of measurement should be used when looking at wages? Ideally the wage and hours of work should be measured for the same period. This can be defined in the questionnaire (for example asking respondents to state gross earnings and hours in the month or year prior to the survey). However, the respondent may not know their wage for that particular period. The normal practice is to ask respondents about their weekly hours, reflecting the fact that this is the period they will know best. For the wage, however, the easiest period for most is the month. For those who are paid for a different period a simple calculation will need to be made, which introduces the possibility of error; however, this problem is mitigated by the use of wage bands, shortly to be discussed.

⁷ Moreover, these biases are not random, being more likely among salaried workers.

Third, wages are likely to vary because of changes in the wage and hours of work from period to period. This may occur because of sickness absence (which will reduce hours of work and may also reduce the wage) or because of the irregular payment of bonuses (which will raise the wage in a particular period although the bonus may actually relate to performance over a longer period, say a year). As a result, it is common to ask the respondents to state their usual earnings and usual hours. Some surveys also have a separate question to ask about total earnings from bonuses or commission over the year.

Fourth, is the issue of whether or not to ask for an exact figure of the wage. A question that seeks to obtain an exact figure for the wage will offer more information to the analyst than one which seeks to categorise the respondent into one of a number of categories or bands based on the level of the wage. However, questions that ask for an exact figure for the wage typically attract higher rates of non-response, either because people do not know the exact figure, are unwilling to look it up or are reluctant to release the information. Furthermore, this propensity to respond varies considerably across countries within Europe (Parent-Thirion *et al.*, 2007, p. 89) raising the prospect of differential non-response biases.

It is more feasible to request an exact figure if the survey is administered via a personal interview, since the interviewer is then able to reassure the respondent about confidentiality and so on. In a face-to-face interview, the interviewer may also be able to encourage the respondent to refer to a pay slip. Respondents who do not refer to pay slips have been shown to approximate their earnings by rounding. Accordingly, in the absence of a pay slip, an 'exact figure' may not be exact: rather, there may still be some degree of measurement error⁸.

An alternative is to employ a categorical response list, in which respondents is invited to place themselves within one of a number of earnings bands (e.g. deciles). If a banded earnings question is used but continuous data are collected on hours worked, the method of interval regression devised by Stewart (1983) allows for the estimation of traditional wage equations. An alternative is to assign each respondent in a particular band the value of the mid-point of that wage interval, and then to employ traditional OLS. However this cannot be expected to yield unbiased estimates.

A more fundamental problem with banded earnings data however, is that it makes the analysis of income dynamics very difficult. Yet, this final problem with earnings bands has to be discarded because of the usefulness of bands when looking at the international comparability of the proposed question.

An important issue is the equivalence of bands for the earnings question. Since earnings levels differ markedly across Europe, employing the same absolute bands in different countries would lead to within-country bunching across few bands, and hence too little within-country dispersion would be captured. In addition, absolute bands would fluctuate according to currency shifts between the Euro and other European currencies.

⁸ Dickens and Manning (2002, p. 14) report an investigation of the UK Labour Force Survey in which, in the absence of pay slips, respondents tended to round annual earnings to the nearest £1,000, monthly earnings to the nearest £100 and weekly earnings to the nearest £10.

To circumvent these problems, one can devise country-specific bands determined by the decile points in each country's hourly wage distribution (as provided from another source). When these bands are compared at the relevant purchasing-power-parity exchange rates, analysts will be able to undertake international comparable analyses; while within-country analyses of the distribution across the deciles will have plenty of scope.

In sum, to measure the wage it is recommended to ask for a respondent's monthly gross salary or wage, using a categorical response list of earning bands determined by country-specific decile ranges, and for the usual hours of work (see proposed indicator on the working week in section II.6).

Box 9: Indicators for Wages

Indicators	Survey questions
Gross salary	WAGE, IREMUN
Hours of work	AHOURS, AFULLTIME, EOVERTIME

II.5 Skills Utilisation

1) Definition and rationale for survey inclusion

Perhaps more than other concepts discussed in this chapter, skill or competence is a key issue both for employees and for employers. By the general phrase “skills utilisation”, we encompass three main concepts that are relevant to the employees' experience of organisational change: the level of skills or job competences, their development or enhancement, and the extent to which the job skills match the skills possessed by employees. All three concepts need to be captured in the survey.

The relevance of skills needs little justification. Theories of “skill-biased technological change”, or equivalently of the “knowledge economy”, are at the heart of a widely shared understanding of what has been happening to labour markets across the industrialised world in the last several decades. An important school of thought puts these theories at the forefront of explanations of changing inequality, though this is not a consensus view point. The general belief, however, is that the prevailing technology of the current era is such as to increase the relative demand for more skilled labour, at the expense of unskilled labour, in the advanced economies. Specifically, it is held that new information technologies based on computers, aside from requiring widespread acquisition of computing skills, are substituting for much of the low-skilled work that traditionally offered opportunities for the large proportions of populations that left school without higher qualifications or training, and generating jobs needing graduates or equivalently trained labour. The idea that we live in a knowledge economy provides the reason for this increasing demand for highly-educated labour, namely that better educated workers are needed to enable companies to compete in a world where the prime source of competitive advantage comes through innovation and efficiency, which derive from superior knowledge and competences among the workforce. Economists typically encompass these arguments in the phrase “skill-biased technological change”.

Recent thinking emphasises, however, that new technologies may not be able to replace all types of low-skilled labour (Autor et al., 2003). Rather, it is primarily the routine jobs and tasks that can be automated, while non-routine manual jobs persist. Such jobs might still be low-paid, if only because there is an abundance of supply of workers able to perform such jobs. As a result there can over time develop a polarisation of a nation's workforce, in which high-paid jobs for university-educated workers expand the fastest, followed by those at the lowest end, where jobs expand because of demographic demand and other factors. In this scenario, it is the middle-level jobs that disappear, even those requiring cognitive skills, if the required tasks are fairly routine and replaceable by computerised equipment. The higher-level jobs expand fastest, however, because there is a complementarity between computing skills and the analytical and interactive skills needed to introduce and make effective new technological and organisational systems. In this perspective, what is important is the change in deployment of generic functions and skills, categorised according to the extent to which they are seen as routine or non-routine, and along other dimensions (Spitz-Oener, 2006).

Ideally, the key generic skill to be measured is computing skills, but other generic skills have been found to be increasingly important, in particular communication skills and literacy skills (Felstead et al., 2007). Higher-level interactive and analytical skills are argued to be complementary with technological and organisational change. Distinction is frequently made also between basic skills – literacy and numeracy and IT skills up to a threshold level that facilitates both employability and the ability to learn – and other higher level skills. Equally, we must distinguish between such generic skills and the attitudes and orientations that are important for doing good work – for example, good time-keeping, customer orientation, service sensitivity, honesty. Often it is the latter that employers emphasise in their recruitment, rather than technical skills.

To these categories must be added the distinction between competence and skill. The former has been defined as an “underlying characteristic of an individual which is causally related to effective or superior performance in a job” (Mansfield, 2004). The latter is seen by economists as a productive input or an aspect of “human capital”. However, “skill” is also seen in more narrow terms across a range of perspectives, and has undergone a certain evolution in its meaning over time.

For practical purposes the distinction between skills and competence is likely to be of less relevance in a survey context than in detailed job analyses in qualitative case studies. In either case, what is particularly relevant is the distinction between the skills or competences that an individual possesses and those that are needed to perform jobs. This distinction is important both for theoretical and for practical reasons.

The theoretical justification for wanting to capture this distinction by one or more indicators in the survey is that a mismatch between own-skills and job-skills is an indication that employees may not be fulfilling their potential in the workplace; or conversely that they are struggling to keep up because of deficient skills. There is evidence that skills mismatches and qualifications mismatches lead to a loss of subjective well-being (Green, 2006, pp. 162-163).

The practical reason for stressing the distinction is that it is very difficult to measure workers' own skills or competences in a survey. Unless one were able to somehow test respondents' skills, the only reliable way to measure own-skill is through indicators of education and prior work experience. However, educational achievement and prior work experience are only partly valid as indicators of competence at work. Education inculcates other attributes apart from purely work skills, and a high level of education is no guarantee of great competence at work. Subjective self-assessment might be a more reliable method, but its reliability is dubious and is subject to too many potential biases, which would be exacerbated in the context of an international survey. Testing respondents' skills is only feasible for a narrow range of skill domains (primarily in literacy, numeracy and IT), and then requires very large resources, and considerable interview time. This is the objective of the OECD's Programme for the International Assessment of Adult Competences, and should definitely not be part of the current survey.

Thus, this survey should concentrate on measuring some of the important dimensions of job-skills. Generic skills have already been noted above. To this can be added the notion of the "broad skill" or competence required for a job. The latter is typically related in sociological literatures to the complexity of the job, which cannot be measured directly, but which can be proxied by the extent of the prior education, training and learning inputs needed.

In addition to the level of skills or competences, it is also useful to capture the extent to which employees are being required and facilitated to develop their skills through training and other forms of learning in the workplace. The measurement of learning is important, given the focus on organisational change, and the likelihood that often such changes will accompany technological innovation. Employees may need, in this perspective, to acquire training both to renew and expand their technical skills and to deal with the enhanced importance of interactive skills in the workplace. The form that the learning takes may also be relevant: in some cases new skills are acquired through participation in formal training courses, but in others, especially with small enterprises, skill acquisition often proceeds more informally.

2) Factors relevant to the choice of indicators

As has already been noted, the measurement of own-skill is largely restricted to indicators for formal educational development and work experience, because direct measures are infeasible given time and resource constraints. Considerable progress has been made in recent years, however, in the development of indicators to capture job-skills. For broad skills or competence, while one cannot measure job complexity directly, one can obtain a proxy indicator of complexity in terms of the education level and prior experience needed to acquire the skills to do the job. For generic skills, the idea is to question respondents about what generic tasks they are performing in their jobs. Behaviour-related and factual questions are seen as preferable to items asking about personal competences.

While time limitations are relevant to all parts of this survey, the measurement of several generic skills runs up against this constraint with a vengeance. To capture the

full range of generic skills might require 30 to 40 items, which will be hard to justify in competition with other space. We have therefore proposed that the survey is restricted to the most important generic skill, namely computing skills and problem-solving skills. Computing skills complement the indicators for the role of ICT in work organisation discussed above, and can be measured at the individual level using tested instruments. Problem-solving skills are widely thought to be increasingly important. We are aware that organisational change has possible implications for other generic skills, especially communication skills, but have reluctantly omitted these from the proposed telephone questionnaire.

The skill change measures should where possible have a time span that corresponds to the period of organisational changes being interrogated in Chapter III.

3) Proposed indicators

A person's own educational achievement is one measure of a person's competence, though it is only a loose measure. It will also be an input into a derived measure of educational mismatch (see box 10).

Before moving on to the next indicator, it is important to expand a little on what aspects of educational attainment might be most relevant. Educational attainment can be considered to comprise of two components: the level of attainment; and the field of study. The progressive nature of educational systems means that the level is the more informative concept of the two for determining the labour market value of the education a subject has acquired. It is also the more commonly measured concept. The field of study is much less commonly measured in survey research. It has been shown to be important in some studies of wages (for example see Shannon, 2001). However, it is also the case that the field of study only tends to become relevant after post-compulsory education, so is not relevant for many labour market participants. In view of the limited space that is likely to be available to measure educational attainment, we therefore focus solely on the level of attainment.

We recommend that ISCED-97 is adopted as the initial indicator of educational attainment, both because some detailed work has already been done to map the classification in Europe and because ISCED will have broader comparability than the new European Qualifications Framework (EQF) outside the EU.⁹ At the same time, however, we recommend that we should monitor developments in the European Social Survey, for which Schneider, who has undertaken detailed evaluations of ISCED-97, has recently proposed a variant of ISCED-97 (Schneider, 2007). We also recommend that we should monitor developments with the EQF, as this may represent the most attractive classification once it takes on a more definite form.

The second indicator of a person's own competence is the extent of their prior work experience. The intention is to capture the total amount (in time) of work experience, as a measure of the transferable skills acquired while working. As with education, this is also an imperfect measure, because the extent to which a person's competence is enhanced through work experience depends on the person's qualities and on the quality of

⁹ The EQF looks at the outputs of education rather than inputs.

the previous experience, neither of which can be properly measured in a survey. Nevertheless, the length of work experience is widely found to be positively related to wages received, and this gives some reassurance that this indicator is positively correlated with competence. The relationship is normally found to be quadratic, with the interpretation that later years of work experience contribute successively less than earlier years to the acquisition of skills. Thus, this indicator is supplemented by its square.

The education achievement required for a job is the counterpart of own educational achievement, and is designed to capture the concept of broad job-skill. The complexity entailed in a job is partly indicated by the level of education that must be achieved in order to be able to do the job.

Items should distinguish between whether an educational qualification/certificate is needed just to get the job, or whether it is needed actually to do the job. This distinction affords a measure of the extent to which employers may be using educational qualifications as a signal of other ability.

The level of prior work experience required for a job complements the previous indicator, in recognising that another part of the competence required to do the job is acquired in doing relevant work experience. This work experience will be accompanied, in some but not all cases, by periods of training. In some surveys an attempt is made to capture separate indicators for this period of training; however, a simpler method is to capture the total length of the period of relevant experience.

New organisational structures and practices are often found to be accompanied by the introduction of information technologies, and to need problem-solving skills. Computing skill is the fastest-growing generic skill in the current era, whether it is the majority of the working population which has been learning to use computers at relatively low levels for word processing, e-mails and simple uses of the internet, or the minority which has been acquiring programming skills or at least familiarity with sophisticated packages tailor-made for each industries' purposes. The survey develops indicators for the frequency of computer use by employees, and for the level of sophistication with which they are used. As regards problem-solving skills, it has been found to be important to distinguish between relatively trivial problems and those that require sustained thought to resolve. The latter are thought to be those at stake when organisations change, so our proposed indicator focuses on problems that take at least 30 minutes to resolve. Communication and literacy skills have been noted to be increasingly important generic skills but measuring them would require considerable interview time. The use of a foreign language at work, which reflects a job requirement connected with the globalisation process, captures a component of communication and literacy skill. It is a very simple and objective question with straightforward answers and relevance in the European area where many different languages coexist.

Skills mismatch is another important area that this survey develops indicators for. There are two kinds of mismatch indicators that can be developed.

First, there can be a mismatch between a person's own educational achievements and the achievements that are required for the job. An indicator for this can be derived from the other indicators already described above. An addition that could be considered, though not further developed here, is an indicator of whether there is a mismatch between the field of education and the type of job. Though this indicator of field mismatch has been developed in some survey contexts, it has not received widespread use by mismatch analysts. The concept of field of education may also be less appropriate for those only reaching lower educational levels.

Second, there can be a mismatch between a person's own skills and those required for the job. While surveys will not normally generate an indicator for own skill, a subjective indicator for skills mismatch can be obtained, which measures under-utilisation of skill. This indicator could refer either to skills in general (as proposed here) or to particular skill domains.

In several perspectives, it is recognised that companies vary in the extent to which employees are expected to continue learning new skills while working. In the context of organisational change, learning of new skills and possibly also the development of new orientations is paramount. This indicator should capture the employees' perception of whether learning is something that goes with the job.

In distinction from the previous indicator, which refer to the requirements for learning (the demand side), the survey also collects indicators of the supply side of learning (though not with the same attention to detail used in other surveys that focus only on training and learning). Here, it should be possible to tailor the indicators to the same period over which questions about organisational change are being asked. Of interest, first, is whether or not the employee participates at all in training, and it will be important to try to pick up evidence of any of a multiple variety of training forms. Second, the quantity or intensity of training can be captured by the total number of hours spent in training.

However, it is widely recognised that training is not the only means by which employees acquire new skills. Especially in smaller enterprises learning takes place informally, by trial-and-error with advice from supervisors, by watching others, etc. Employees in such situations may not recognise them as "training"; hence it will be useful to include an indicator for participation in a learning activity while not actually in training.

The outcome of training and learning activities would be expected to be greater skills. While it is not possible to ask about own-skill levels, a possibility is to obtain an indicator of the extent of skills change over the period of organisational change (two years). An addition or an alternative would be to obtain an assessment of how job-skills have changed over the period. In both cases, the indicator would have to be captured by subjective instruments, with attendant problems of social esteem bias. Such bias might or might not be assumed to be similar across countries. Nevertheless, the theoretical relationship between organisational change and new skill demands could be additionally supported and investigated if such an indicator were present, alongside the other indicators for training and learning.

Box 10: Indicators for skills utilisation

Indicators	Survey questions
Own educational level/achievement	HEDU
Extent of prior work experience	HWEXP
Level of educational achievement required for a job	DEDGETJOB, DEDDOJOB
Extent of prior relevant work experience required for a job	DWKEXPJOB
Use of computing skills	BCOMPLVL
Problem solving skills	DPROBSOLVE
Langage skills	BFORLANG, BFORLANGa-b
Skills mismatch	DOVERSKILL, DUNDERSKILL
Learning requirements	BLRNEW, DHELPWORKER
Participation in, and intensity of, training and other learning	DTRAINED, DTRAINETIME
Skills change	DSKILLCHG

II.6 Working Time and Work-life Balance**1) Definition and rationale for survey inclusion**

Working time is an important component of the majority of people's lives (work-life balance). Therefore, it is important to consider what impact organisational change will have on individuals both in terms of their working hours and in terms of how their work affects their social and family life, the so called work-life balance.

The communication entitled "Employment and social politics: a framework for investing in quality" (COM(2001) 313 final), that was presented by the European Commission to the European Council, the European Parliament, the Economic and Social Committee, and the Committee of the Regions, contains a list of 10 dimensions of the quality of work life (QWL) and this list includes work organisation and work-life balance. The key policy objective regarding work organisation and work-life balance is: "*To aim to ensure that working arrangements, especially concerning working time, together with support services, allow an appropriate balance between working life and life outside work.*" (COM(2001) 313 final, p. 13)

In this section we consider those factors of employment time that could be affected by organisational change and also the effects of organisational change on work-life balance. However, there is likely to be some level of overlap between the two discussions as working time will be a large part of work-life balance for any employee.

It is important to note that working time can also be seen to be part of job demands. We can separate out the effects of job demands and working time in terms of organisational change by considering that changes in working time can be due specifically to

changes in the organisation (working time changes) or be an effect of other changes within the organisation (job demands change thus affecting working time). When it comes to indicators and items to assess changes in working time it will be well worth considering whether we can separate out these two effects.

What must also be considered is that while working time is a major part of working people's lives, it is not the only part and so what happens at work can affect the rest of an individual's life. This is especially so now with the rapid increase in female participation rates which now means that the household and the workplace are no longer so easily separable. This work-life balance has become a key policy objective of the EU.

Work-life balance will be of interest to the MEADOW project because organisational change is likely to have a major impact on an individual's work-life balance and vice versa. For example, a company that cuts some of its work force and re-allocates the work to the remaining employees could mean that the workers are more pressed for time and find that they have to work harder than before. This will then impact on their work-life balance as their social and family life may become more strained because of the added working pressures.

2) Factors relevant to the choice of indicators

The Canadian Policy Research Networks (CPRN) research on job quality suggests that working time comes under the indicator of job demands. In this chapter we have separated out the terms although it must be borne in mind that there is a large degree of overlap between job demands and working time, with working time likely to be a large factor in the former¹⁰. However, working time is a measure of job quality in its own right since a worker is more likely to work a job with fewer hours than an otherwise equivalent job with longer hours. Therefore we consider, amongst others, the indicators of job demands from the CPRN research as indicators of working time. Those indicators are: workload, long hours of work, and unpaid overtime.

The European commission suggested that the following could be good indicators of work-life balance: the proportion of workers with flexible working arrangements; the opportunities for maternity and parental leave and take-up rates; and the scale of child-care facilities for pre-school and primary school age groups.

However, the CRPN suggests that indicators of work-life balance include the following: overall work-life balance; how work-life conflicts affect organisations; how work pressures affect families; how work-life balance impacts individuals; and solutions to work-life imbalance.

Given the issue of the amount of time constraints on questionnaire length, we will for now only consider the indicators suggested by the European Commission. This choice is in line with the principles for item design outlined in the introduction, as the CRPN indicators would involve subjective assessment. However, opportunities for maternity and parental leave is not used as an indicator in this survey as it is better suited to be analysed at the employer level.

¹⁰ Also see the discussion above.

3) Proposed indicators

How many hours an individual works could be an indication of organisational change or an indication of changes in job demands due to organisational change (see the definition and rationale for survey inclusion for this section). Therefore, it is important that we know how many hours an individual usually works (see box 11). This is also important when considering the hourly wage that an employee earns (see section II.4). Whether employees work part time or full time is also important here, as well as the contract type that they have, as organisational change may lead to changes in both (see section II.7).

The amount of overtime that an individual works could also be an indication of changes in the organisation. Increased overtime could indicate that an enterprise is increasing production due to increases in demand for their products and so they expand their employment levels in terms of man hours. This would be a good indication of increased flexibility within the enterprise.

Organisational change can also be seen from changes in when an employee will work. It may be that employees are able to work earlier hours or later hours because of commitments outside work (also see the discussion of flexible working hours below), or they may be becoming more adaptable and can work hours that are not necessarily 9-5, Monday to Friday.

The length of holiday entitlement that an employee may receive may also be important in terms of organisational change. Any increases or decreases will have an impact on an employee's life outside of work.

As already outlined in this chapter, working time is a key component of workers' lives. Therefore, any processes that allow an employee to choose their hours of work to some extent or allow them to change their working hours because of changes in their lives outside work are likely to improve the work-life balance of an individual. In addition, the contract type and type of employment that a worker has may also account for some flexibility in the working time (see section II.7).

Increasing numbers of single parent households and dual working households means that the availability of child care at the workplace (or elsewhere) or help in covering the cost of child care, and being able to take time off work during school holidays or only work during term times are important in improving the quality of jobs.

Box 11: Indicators for working time and work-life balance

Working time	Working week	AHOURS, AFULLTIME
	Overtime	EOVERTIME, ECHOICE, EREFUSE
	Working outside "normal" hours	BONOUT
	Holiday entitlement	EHOLIDAY
Household composition	Partner	HCOHABIT, HSPSEJOB
	People dependent for care	HCARE
Work-life balance	Flexibility of working week	ECHOOSETIME, ECHOOSDAY
	Child care arrangements	HCHILDCARE

II.7 Employment Security

1) Definition and rationale for survey inclusion

Flexibility and security were included as one of the 10 dimensions of the quality of work life (QWL) that were contained in the communication entitled "Employment and social policies: a framework for investing in quality" (COM(2001) 313 final) that was presented by the European Commission. Employment security will be a key component of the quality of a job, and organisational change is likely to have a significant effect on the employment security of the workers.

Flexicurity is also a key of the Lisbon strategy for Growth and Jobs (European Commission, 2007). Workers, according to the Lisbon strategy, need to become more adaptable (as well as enterprises) to allow EU member states to compete in the global economy. Combined with the increased adaptability of workers there should also be increased security of employment.

It is necessary to separate and define at this juncture exactly the difference between employment and job (in)security. Formally, when looking at insecurity, the former is the loss of welfare that arises due to uncertainty at work, and therefore entails all forms of employment, while the latter is the probability of individuals losing their current job.¹¹ (Green, 2006, p. 130) Employment insecurity also includes the cost of job loss, which is the cost incurred if job loss actually takes place (Green, 2006, *Ibid*).

¹¹ Insecurity can also arise due to uncertainty in job continuity because of a possible promotion or job cuts for example. In the definition above only the welfare loss due to job loss is considered.

¹² See also Klammers, Muffels and Wilthagen (2008).

2) Factors relevant to the choice of indicators

The European commission suggests the following indicators for employment security and flexibility¹²:

- The effective coverage of social protection systems – in terms of breadth of eligibility and level of support – for those in work or seeking work
- Proportion of workers with flexible working arrangements – as seen by employers and workers
- Job losses – proportion of workers losing their job through redundancies, and proportion of those finding alternative employment in a given period.
- Proportion of workers changing the geographical location of their work

The first indicator is a general indicator that cannot be examined by looking at employees. The flexibility of the workers has already been examined in section II.6, so the second and last indicators have already been discussed. The third indicator can be examined best at the employer level to see how many workers have lost their jobs, while the latter part of the indicator can be examined imperfectly by asking employees how difficult they would think it would be for them to get an equivalent job if they were to lose their current one.

The “Canadian Policy Research Networks” (CPRN) on job quality also suggests the following indicators for security : temporary employment and job security.¹³ The latter will be analysed as defined above, and therefore includes both the probability of job loss and the cost of job loss. The former of these can be measured using survey techniques to a high level while the latter indicator can be measured to a good, but not perfect, level. (Green, 2006, pp. 130-149)

3) Proposed indicators

The type of job that individuals are employed in will affect their security (see box 12). It is very likely that those in temporary jobs will be less secure than those who are in permanent positions. In addition, part time and full time work may have different levels of security associated with them.

How likely it is that individuals will lose their job is going to be a good indicator of job security and therefore employment security also. Here, what can be used is respondents’ *ex ante* insecurity associated with the likelihood that they will lose their job within a given period of time, in this case the next 12 months. The questionnaire also captures whether this *ex ante* insecurity is connected with workplace changes (see section II.1).

The cost of a job loss cannot be measured perfectly using survey techniques. One imperfect measure of the cost of job loss is to ask the respondent *ex ante* how difficult it would be to regain employment that is ‘as good as’ their current employment. The harder it is that an individual believes it will be in getting an ‘equivalent’ job the higher would be the associated cost of job loss.

¹³ See <http://www.jobquality.ca> for more information.

Box 12: Indicators for job security

Indicators	Survey questions
Employment type	ACONTRACT, AFULLTIME
Probability of job loss	FLOSEJOB, BJOBRISK
Cost of job loss	FGETNEWJOB

II.8 Worker well-being

1) Definition and rationale for survey inclusion

When considering organisational change and its implications for the experience of employees, an important and relevant outcome will be their affective well-being. Are employees enthusiastic and aroused by the changes being made, or are they generally depressed about them? How much stress is generated by their job? If individuals’ job becomes more intensified because of organisational change, has this led to them becoming stressed, possibly to the extent of suffering mental ill-health?

We begin with the potential downside, namely stress, since this has received considerable attention by researchers across Europe in the light of the intensification of work effort and increased skill requirements of jobs in many countries. “Stress”, however, is somewhat ambiguous and has become an ‘umbrella’ concept: it has been used in many ways and in relation to many different topics. D’Amato and Zijlstra (2003) provide an extensive overview of the literature on occupational stress and, as pointed out in their overview also, stress is often considered to be primarily an emotional process, but can affect physical health as well.

Historically, there are four dominant stress approaches :

- Stress as a *stimulus* (*cf.* input), i.e. an external load or demand originating from an event or situation that affects the individual and is potentially harmful;
- Stress as a psychological or physiological response (*cf.* output) of the organism to external stimuli;
- The interactional approach, which describes stress as a process where the organism responds to particular situations or events (i.e. stressors) by developing strain reactions. Different constructs are used to indicate mental health in the stress/strain process, sometimes they are called *negative emotions* as anxiety, depression, and anger.
- The cognitive appraisal approach, which defines stress as the response when people appraise a situation and perceive an imbalance between the demands imposed upon them and the resources they have available to meet those demands (Moore and Cooper, 1998; Buunk et al., 1998; D’Amato and Zijlstra, 2003).

In the past 20 years, many studies have looked at the relationship between job stress and a variety of ailments. Mood and sleep disturbances, upset stomach and headache, and disturbed relationships with family and friends are examples of stress-related problems that are quick to develop and are commonly seen in these studies. These early signs of job stress are usually easy to recognise. But the effects of job stress on chronic

diseases are more difficult to see because chronic diseases take a long time to develop and can be influenced by many factors other than stress. Nonetheless, evidence is rapidly accumulating to suggest that stress plays an important role in several types of chronic health problems - especially cardiovascular disease, musculoskeletal disorders, and psychological disorders.

The definition by Houtman, Jettinghoff and Cedillo (2007) for the World Health Organisation (WHO) goes much along the same lines with central attention to the (pattern of) reactions which may result from a perceived imbalance between demands and environmental or personal resources. Reactions may include physiological responses (for example increased heart rate), emotional responses (for example feeling nervous or irritated), cognitive responses (for example a reduction in attention) and behavioural reactions (for example aggressive, impulsive behaviour).

When in a state of stress, one often feels tense, concerned, less vigilant and less efficient in performing tasks. When exposure to stress persists over prolonged periods, workers do not have enough time to recover from it. Stress may eventually cause mental and physical disorders and impair the immune system, resulting in sickness and absence from work and work disability. Other adverse consequences of work-related stress consist, for *employers and their companies*, for example of increasing personnel turnover, decreasing performance and productivity, decreasing quality of work and products and increasing complaints from clients/customers (Houtman, Jettinghoff and Cedillo, 2007).

Another school of thought, however, has argued that stress has become an overused concept in the analysis of modern workplaces, and that it is necessary also to consider the resilience of workers, as well as the positive emotions that may result from work situations (Warr, 2007; Wainwright and Calnan, 2002). Emotional affect has been theorised in a variety of ways. A relatively simple construct is the 2-dimensional framework in which emotional affect is seen in terms of, on one hand, the extent of arousal or passiveness, and on the other hand of the extent of feeling good or bad feelings. Distinction is also made between domains of emotional feelings (work, home etc). For the purposes of this survey, it will be important to measure the concept of emotional affect in the domain of work, including the positive emotions.

Another indicator of organisational change may be the health and safety of workers as they perform their job. Health and safety was included as one of the 10 dimensions of the quality of work life (QWL) by the European Commission. Therefore, as organisations change, one would expect to see improvements in the health and safety of workers in their roles. However, organisational change could also negatively impact health and safety at work. As organisations adapt to new working practices or new technologies, so workers come into contact with new machines, techniques or working methods which can increase the risks and challenges that workers face.

2) Factors relevant to the choice of indicators

Indicators should focus on the mental state of employees. Furthermore, it will not be adequate to address this topic using retrospective questions, and that is why the panel design is the appropriate method.

From a methodological point of view, a panel design with a time lag of one year among employees can be assumed appropriate to study the relationship between job characteristics and mental health (De Lange et al., 2004). The relationship between job characteristics (that is the Demand-Control-Support dimensions) and mental health are reciprocal: apart from the (stronger) 'normal' causal order of job characteristics influencing health, several (high-quality) longitudinal studies also show reversed causality (with health influencing job characteristics across time) (De Lange, 2005). This implies that the relationship is reciprocal, which affirms the use of a panel design.

The correspondence and content analyses, conducted by D'Amato and Zijlstra (2003), of the abundant stress literature shows that stress is often defined operationally by means of mental health or psychological disorders. These researchers conclude that when speaking about 'stress-related mental health problems' one should particularly look at people with the following psychological complaints: 'depressive feelings', and 'feelings of exhaustion' or 'fatigue'. It is also quite likely that this person will experience a reduction of self-efficacy, as (s)he cannot really 'get to things' or 'get things done'. Also a study by De Lange, Taris, Kompier, Houtman and Bongers (2003) finds that mental health indicators were included in the majority of the longitudinal, high-quality studies on the job strain hypothesis of the Job Demand-Control(-Support) model (Karasek, 1979; Karasek and Theorell, 1990; see also section II.3 of this chapter).

The indicators need also to be able to pick up potential positive effects of organisational change on employees' emotions.

When looking at health and safety the European Commission suggests using the following indicators:

- Composite indicators of accidents at work, fatal and serious, and including costs
- Rates of occupational disease, including new risks, such as repetitive strain
- Stress levels and other difficulties concerning working relationships

Looking at the first two of these indicators would require a lot of time and is more the remit of a detailed survey on health and safety at work. Consequently, a quick measure of work accidents is needed for this survey. The latter of these indicators has already been discussed in the previous paragraphs looking at job stress, and so will be included in the employee survey.

3) Proposed indicators

Employees' well-being could come from many parts of their life (see box 13). Therefore, any questions on how employees are feeling should look at how their job has made them feel recently and not how they have been feeling in general. While of course it may be true that stress at work may lead them to feel differently in their everyday life, it is also true that feelings from everyday life that have nothing to do with work could be included in answers by employees to this latter indicator. To address this issue directly, the questionnaire will adopt the work-related well-being scale developed and tested at the Institute of Work Psychology (Warr and Parker, 2008). Although the size of the full scale, encompassing also other dimensions of work-related well-being, comes to 28 items, parts of two separate 6-item scales are adopted here. First, 3 items on depres-

sion from the Enthusiasm-Depression scale are included, which has been thoroughly tested (Warr, 1990, 2007). The internal consistency reliability of the scale is around 0.80 in industry-specific and national samples (Stride et al., 2007). Second, 3 items on anxiety are included from the Contentment-Anxiety scale, to capture work pressures (see also section II.3).

Another indicator used in the survey for worker well-being is how the employee feels overall about their job when everything is taken into consideration. This could be broken down to look at satisfaction by areas of employees' job, for example their satisfaction with their wages and the tasks they perform, but given the time constraint for the survey this will not prove possible. A four point scale is used for this which could be adapted further if the survey delivery mode changed. The questionnaire also captures on a four point scale whether the employees are satisfied with the way they have been involved in decisions concerning workplace changes (see section II.1).

Organisational change could also lead to changes in the health and safety of workers. Indicators that are used in the survey to analyse this are the number of days taken off work because of health problems and whether any days are taken off work because of accidents or other health problems caused by work.

Box 13: Indicators for worker well-being

Indicators	Survey questions
Employee well-being	GWELL
Job satisfaction/dissatisfaction	AJOBSAT, BINVOLVESAT
Days of absence	GABSENCE
Whether any days of absence due to work accidents	GABREASON

II.9 Modules

The principle of a core questionnaire plus modules has been established in chapter II of the Guidelines. What would be interesting areas for module development? Modules could be useful to cover topics that need to be covered using questions with different scales or formulated differently than the ones in the core questionnaire. An example could be a module on time use at work. The employee could be asked to note during one day how much time he or she spent travelling to work, doing his main task, coordinating with colleagues, discussing about organisation matters etc. This could be a good way to build up a reliable quantitative measure of time spent in organisational matters which could capture part of what is meant by "organisational capital". Modules could also be used to go more deeply into topics that are only partly covered in the core survey and that would need some national development to be covered in more detail. For instance, to further assess employment relations, there is a need to take into account differences in industrial relations systems at the national level. A module could finally be used to go more deeply into public policy issues like active aging policies, family friendly policies, equal opportunity policies or to develop a complementary topic that is not covered in the core like for example health at work or diversity and minority group situation.

III. Background demographics and job characteristics

This section of the chapter provides a discussion of how the demographic characteristics of employees and their job characteristics might be conceptualised, defined and measured in an employee questionnaire.

There are a variety of rationales for including background demographics in the employee questionnaire. First, the experience of organisational change may vary in systematic ways according to characteristics such as sex and age for example. This may be because of direct causal mechanisms (for example through discrimination) or because these characteristics serve as reasonable proxies for other characteristics which are more difficult to measure (lifetime work experience for example). The availability of data on background demographics then enables the analyst to explain a greater degree of variation in the experience of organisational change than would otherwise be possible. Second, the presence of background demographics enables analysts to categorise subjects into sub-groups that are commonly the focus of policy-makers (men and women; younger and older workers). Third, the collection of data on background demographics provides information which may be used to assess the degree of bias in the achieved sample, and the nature of any corrective weighting, since the profile of the population according to background demographics such as sex, age and occupation can typically be observed in official data.

This section focuses on those characteristics that were identified as variables of interest. They were : sex, age, migration, occupation and job tenure¹⁴. The discussion that follows also mentions some possible extensions to this list where additional measures are directly related to those which have already been proposed (for example, a discussion of the merit of including a measure of gender job segregation is included).

It is vitally important that the measures of background demographics are comparable with other surveys, and so therefore it has been decided to explicitly use cross-validated measures of the following areas of interest from other international surveys.

1) Definition and rationale for survey inclusion

Sex

Organisational change may affect men and women differently. Such differential treatment may come about directly through discrimination (e.g. in hiring or firing). It may also come about as an indirect result of differences in the jobs that they hold. For example, women are more likely to work in subordinate positions and to be employed on insecure forms of contract, making them more vulnerable to organisational change. That is not to say that outcomes are necessarily less advantageous for women: organisational change also offers an opportunity to address existing imbalances (Edwards *et al.*, 1999). Accordingly, it is important to measure the sex of an employee in order to have the opportunity to examine such differences in the experience of organisational change.

¹⁴ Educational attainment was also identified but has been discussed in section II.5 of this chapter.

Equality between the sexes is also a broad policy concern of the European Commission, with the EC Treaty providing that the Commission should aim to eliminate inequalities, and promote equality, between men and women in all of its activities (Article 3(2)). Accordingly, one can expect that differences in the experience of organisational change between men and women will be a major interest for policy makers at the European level.

It is common to use the term 'gender' rather than 'sex'. In common discourse they are treated as equivalent. However, sex is the more precise as it refers to the dichotomous biological classification into male and female.

Definition

Sex: "whether one is born male or female".

Age

In common with sex, age is a demographic characteristic that is commonly found to be associated with differential employment experience (e.g. higher wages, higher occupational attainment). In the most part, this is because age serves as a reasonable proxy for lifetime work experience and thus accumulated human capital. In relation to organisational change more specifically, it is also the case that the impact of any job losses that might arise from organisational restructuring is likely to be felt most adversely by older workers. This is partly because older workers may suffer from discrimination due to employers' expectations about patterns of withdrawal from the labour market and assumptions about health, vitality and competence (Metcalfe and Meadows, 2006). The age of the employee may thus serve as an important variable with which to depict varying experiences of organisational change.

The provision of employment opportunities for younger workers and the retention of older workers are also important objectives for the EC. In respect of younger workers, the EU is primarily concerned with providing access to employment, with providing access to training and development, and with the protection of young people at work (see The Protection of Young People at Work Directive, 94/33/EC). In respect of older workers, the EU has set itself the target of having 50 per cent of the EU population aged 55-64 in employment by 2010 (currently 44 per cent). The 'Council of the European Union Joint Employment Report 2006/07' also highlights the need to retain older workers in the labour market by creating new job opportunities, training and incentives to remain in the workplace. Accordingly, one can expect that differences in the experience of organisational change between workers of different ages will be a major interest for policy makers.

Definition

Age: "elapsed time since the subject's date of birth".

Migration

Migration is of significant interest because of the large inflows of workers that many countries have experienced in the past two or three decades. Some 22 of the 27 EU

member states experienced positive net migration in 2007, whilst the EU as a whole experienced estimated net migration of plus 1.9 million people. (Eurostat, 2009). Taking one country as an example, the UK Labour Force Survey shows that 13 per cent of all those in employment in the UK in 2008 were non-UK born, and that around half of the current stock of migrants had arrived since 1997 (Clancy, 2008). The Lisbon strategy pays particular attention to the need to better integrate immigrants and their descendants into host labour markets. Nevertheless, few surveys can say much about the employment experience of migrants (as opposed to their employment prospects, which can be investigated using household surveys). MEADOW has the ability to make a substantial contribution in this area.

Definition

Immigrant: "when one moves to a country other than that of his or her usual residence".

Occupation

An occupational classification is a tool for organising jobs into clearly defined groups, based on the tasks and duties undertaken in the job. So in common with the other background variables discussed here, occupation provides a framework within which to identify differences in labour market behaviour and experience. In the context of organisational change, a standardised classification of occupations can be used to compare the types of work undertaken by those employees in different countries who are subject to organisational change. For example, professional workers may be found to account for differing proportions of those workers affected by organisational change in different countries. This may help one to better understand any differences in attitudes towards - or experience of - organisational change across countries. A standardised classification of occupations can also be used to compare the experiences of specific occupations in different countries. For example, one might compare the experiences of office clerks across countries. One is then comparing individuals performing broadly similar tasks.

Definition

Job: "A set of tasks and duties performed, or meant to be performed, by one person"

Occupation: "A set of jobs whose main tasks and duties are characterised by a high degree of similarity"

Job Tenure

Job tenure is a useful background variable in a survey of employees, since it can help to explain variations in other job-related characteristics such as wages, occupational attainment, risk of injury and job strain. These associations arise since job tenure provides one measure of those aspects of firm-specific human capital that are not measured by indicators of formal learning. The direction of causality may, of course, run in either direction, since wage levels, prospects for career progression, and risks to health may also prompt quitting. However, this only confirms job tenure as an important variable in labour market research.

At the same time, job tenure is also of direct interest in a survey of organisational change. One traditional means of selecting employees for redundancy has been the “last in, first out” system, in which job tenure thus provides the criteria for selection. Whilst this method of selection is thought to be declining in use, not least because it may be discriminatory when tenure does not correlate perfectly with ability, the role of job tenure in explaining who exits the firm remains a relevant concern for a study of organisational change. More broadly, the continuation (or otherwise) of tenure from one wave to the next is also of interest.

Definition

Job tenure: “years of continuous employment with the current employer”.

2) Factors relevant to the choice of Indicators

Sex

There are no issues that arise in respect of grouping or classification and no apparent cross-national issues. The main choice would seem to be whether one uses the terms ‘male’ / ‘female’ or ‘man’ / ‘woman’. We have chosen the former as these are the terms most commonly in use in existing research applications.

Research into labour market outcomes has shown that sex may also have a second order effect, such that the concentration of male or female employment may have an impact on outcomes over and above any first-order effect associated with the gender of the subject themselves. For instance, it is well established that female-dominated jobs offer lower wages than male-dominated jobs, even for men (Anderson, 2001): a pattern that is thought to be explained by biases in the valuation of skill. Moreover, Abrahamsson (2002) has shown that gender-segregation can be an obstacle to the implementation of organisational changes such as job enlargement, job rotation and decentralisation. Accordingly at the employee level, it could be of interest for an employee questionnaire to collect data on the extent of sex segregation within the employee’s work group. However, given the time constraint issues that have been discussed in this chapter, these issues will not be examined but could be included if the survey format were to change.

Age

It is usually considered sufficient to measure the number of whole years that have elapsed since the subject’s birth, in preference to measuring the elapsed time in more detail. This is because most age-related conditions that apply in socio-economic contexts are based on the elapsed number of years.

Migration

The most pertinent means of identifying immigrants is to ask about country of birth and date of arrival in the host country, as was done in the EU-LFS 2008 *ad hoc* module on migration. Country of birth is to be preferred to citizenship, as the former cannot change over time.

Occupation

The most widely-recognised international standard classification scheme for occupations is the International Classification of Occupations (ISCO) published by the International Labour Organisation (ILO). ISCO is a hierarchical classification scheme with four levels that represent increasing levels of aggregation as one moves from the most detailed classification level (termed ‘unit groups’) to the least detailed level (termed ‘major groups’). ISCO-88 is the current version of ISCO. However, a variant ISCO-88(COM) has been developed for use in the European Union, because of the difficulties that some EU countries had in mapping their established occupational classifications to ISCO-88. ISCO-88(COM) represents the most detailed level of ISCO-88 which all community countries consider feasible to relate to their national classifications (Elias and Birch, 1994).

It is important to note, however, that the ILO have recently completed an updating of ISCO and have published a revised classification named ISCO-08 (ILO, 2007). The new ISCO-08 was disseminated in 2008 and materials have been made available for use in national settings, with the intention that the updated classification – or national adaptations of it – will be used in the round of national population censuses to be conducted from 2010 onwards. It is clear, then, that ISCO-08 will become the international standard. However, it is not yet clear how useable the classification will be across the EU: an important question given the issues noted above in respect of ISCO-88.

There are also issues to be noted in the coding of occupations. In choosing the appropriate level of detail to aspire to, it is relevant to consider the likely reliability of codes at different levels. Coders working with the same information may assign different codes, and may do so for a variety of reasons, including poorly formulated instructions, poor training procedures and simple human error. Some degree of variability is unavoidable but naturally this variability increases as one attempts to code to more detailed classifications (see Bound et al., 2001, p. 3802; Elias, 1997, pp.13-14). Elias (1997, p. 13) summarises the results of four validation studies in the UK in which agreement rates were computed for one, two and three-digit codes.¹⁵ The evidence suggests that levels of reliability deteriorate significantly at higher levels of detail. It is then instructive to note that two-digit ISCO-88(COM) is the level aspired to in pan-European surveys such as the EWCS and EU-SILC. It is also the stated minimum requirement in the Eurostat manual on harmonised core variables (Eurostat, 2007, p. 31). That said, Hoffman (2003, p. 150) recommends that data are coded to the most detailed level supported by the responses, even if such detail is unlikely to be used in analysis.

A further issue is the comparability of coding operations across countries. Even though ISCO-88(COM) is an international standard, the mapping from national occupational classifications is still not straightforward across the EU, being particularly difficult for Italy and the UK (see Elias, 1997, pp. 23-26). One should also note that the nature of the coding is country-specific: nurses and teachers, for example, require different levels of

¹⁵ The inter-coder agreement level is the percentage of pair-wise comparisons in which coders assigned the same code to identical information.

¹⁶ See <http://www.ilo.org/public/english/bureau/stat/isco/isco88/publ5.htm>

education to practice in different countries, and so nurses and teachers can appear in major groups 2 or 3 depending on the national context¹⁶.

Job Tenure

Two pertinent questions arise when deciding upon an indicator. First, is it necessary to measure only continuous employment? Specifically, if an employee has worked for the employer at some point in the past, had a break in employment, and then later resumed his/her employment with that employer, should one count only the most recent spell or sum all spells of employment with that employer? Few employees are likely to have had multiple spells, and those dates of these spells for those that have will be potentially difficult to ascertain. Added to this any firm-specific human capital that was gained during previous spells may no longer be relevant. A further observation is that the duration of the current spell of employment (rather than the duration of all spells) is typically the criteria that determine eligibility to certain employment rights, at least in the UK. For example, employees in the UK must have at least one year of continuous service to become eligible to claim unfair dismissal, and must have at least six months of continuous service to become eligible for maternity pay. Therefore, one should only focus on the current spell.

A second question is whether one should measure employment with the organisation as a whole, or only with the specific workplace at which the employee is currently employed. And further to this, should one measure employment in all jobs or only the current job? If we consider a single spell of employment, then an employee will accumulate firm-specific human capital across all of the jobs in which they have worked with the current employer, whether at current workplace or not. And so, it seems appropriate to measure employment with the organisation as a whole. If the employee has had multiple jobs, there will be some element of accumulated human capital that is specific to the current job. But it may be difficult to determine when the current 'job' began, particularly if only some features of the job have changed over time (for example, the level of responsibility). Accordingly, it seems sensible to measure employment in all jobs within the current spell of employment with the organisation.

3) Proposed Indicators

Sex

The proposed indicator is as follows:

Sex: male or female.

Asking this question may provoke an adverse reaction from a respondent since a person's sex is usually taken to be obvious. For this reason, sex tends to be coded by the interviewer in interviewer administered surveys (as is the case in the European Working Conditions Survey and the European Social Survey). Also note that the characteristic is not likely to change except in very exceptional circumstances and so in a panel it only needs be measured once.

Age

The proposed indicator is:

Age: elapsed time in completed years since the subject's date of birth.

Following Wolf and Hoffmeyer-Zlotnik (2003, p. 262), we propose that a continuous measure of age should be sought, removing age groupings as an option. The Eurostat Task Force on Core Social Variables (Eurostat, 2007, pp. 59-60) recommends asking for the month and year of birth. They argue that asking directly for the exact age may lead to rounding to the nearest 0 or 5 years by some respondents. They also argue that the adoption of age ranges faces the difficulty of identifying appropriate age groupings. We agree with the latter concern but the Eurostat Task Force put forward no evidence to support their former claim. It is also the case that asking for month and year of birth would lead to similar concerns about anonymity that would arise from asking for a respondent's date of birth.

Migration

The proposed indicator is :

Immigrant: country of birth and time elapsed since the subject has first come to a given country

This indicator of geographic origin is complemented by an indicator on membership to a minority ethnic group which could contribute to the identification of second-generation immigrants. However, this question will not be considered acceptable in every European country. For instance, there is an on-going debate in France about the measurement of ethnicity.

Occupation

The recommendation is to code occupations using ISCO-08 for any future implementation of the Guidelines, given that this will become the standard measure of classifying occupations. However, there is only limited knowledge to date on the methods used in implementing this classification.

Looking at the survey questions on occupation, it is not sufficient to ask the employee to state "his/her occupation" as this will often not yield sufficient detail to code to ISCO. Instead, it is necessary to ask the employee to state the following:

- Job title
- Main tasks and duties
- Number of employees in the organisation.

The final item in the list is required in order to distinguish between sub-major group 12 (corporate managers) and sub-major group 13 (managers of small enterprises). However, this item will be collected in the employer questionnaire, and so we require questions only to address the first two items.

Once data on job title and tasks are obtained, these data must subsequently be used to assign an occupation code to each respondent. When coding occupations we

recommend that the source data on job titles and tasks are coded to the full four-digit ISCO-08 where possible, but that the classification is limited to sub-major group during cross-country analysis.

Further, we recommend that the underlying survey data are coded directly to ISCO-08, rather than coding first to individual national classifications and then mapping across from these national classifications to ISCO-08. We also recommend that a subset of the data in each country are coded twice, by separate coders, to provide a measure of reliability that can be compared across countries.

A final issue is that coding errors can naturally compromise the accuracy of comparisons of occupational codes over time, and thereby compromise any attempt to investigate occupational mobility when using longitudinal surveys. In common with Bound *et al.* (2001, p. 3804), we therefore recommend that, in subsequent waves of a longitudinal study, one asks the subject whether their occupation has changed since the previous wave of the survey, rather than inferring change from a comparison of the current and the previously-reported occupational code. This does rely on the subject being able to accurately recall their occupation at the time of the previous wave, unless their response can be fed back to them, which only would be possible in a computer-assisted survey environment.

Job Tenure

The indicator is as follows :

Job Tenure: elapsed time in completed years in the current spell that the subject has been in employment with the organisation.

Further we propose that the longitudinal element of the employee survey should also measure exit from employment with the current employer. This requires that the panel element of the employee survey distinguishes between: (a) employees who remain in employment with their Wave 1 employer but who do not respond at Wave 2; and (b) employees who no longer work for their Wave 1 employer. Furthermore, among this second group, one would ideally wish to code reason for exit (quit / layoff).

It is also critical to know whether the job that the employee holds is a main job or a second job. It is important to keep in mind that given the structure of the survey, the employee is not asked about his main job, but about his job at a given employer for which he has been selected. In total, the survey will allow identifying the characteristics of «second jobs» in country where this phenomenon is prevalent and to control for main jobs/second jobs when looking at global employee outcomes like well being.

Box 14 : Indicators for background demographics and job characteristics

Sex	HSEX
Age	HAGE
Geographical origin	HBORN, HMINORITY
Occupation	AOCCUPATION
Job tenure	AJOBTENURE
Main job / second job	ASECNDJOB, AMAINJOB

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Appendix to chapter IV

The employee survey questionnaire

Introduction

[] Designates notes for the programmer and () are interviewer notes.

[Note for programmer : Include two additional response options for all questions: 8 = 'Don't know' and 9 = 'Refused'.]

(Interviewer note : Never read out loud the response options 'Don't Know' and 'Refused'. Use these options only if given by the respondent.)

[Use 'organisation' instead of 'firm' if the employee works in the public sector]

Thank you for participating in this survey. I am going to ask some questions about your work, and how you feel about it. Please answer the questions based on your employment for <name of employer>. First, I would like to ask some questions on your occupation.

Section A: Occupation

AOCCUPATION [Ask all]

What is the full name or title of your job?

Record verbatim response

What kind of work do you do most of the time in this job? Please describe as fully as possible

Record verbatim response

(Interviewer note : Verbatim responses to be coded to ISCO-08(COM) post-interview)

AJOBTENURE [Ask all]

When did you start working for <name of employer>?

..... Year Month

(Interviewer note : If the respondent says they have had more than one spell of employment with this company or organisation, please consider only the most recent.)

If unwilling or unable to answer AJOBTENURE

AJOBTUREC

Have you been working for <name of employer>?

1. Less than one year
2. One year up to two years.
3. Two years up to five years.
4. Five years or more.

ACONTRACT [Ask all]

Which of the following best describes your job with <name of employer>?

1. Permanent job
2. Contract job with a fixed end date, even if several years in the future
3. Seasonal job
4. Casual job
5. Internship
6. Job through an agency that finds temporary employment

AFULLTIME [Ask all]

Are you working full-time or part-time?

1. Full-time
2. Part-time

AHOURS [Ask all]

How many hours do you usually work in your job each week? Please include paid and unpaid overtime, but do not include meal breaks and time taken to travel to work.

..... hours per week (to nearest hour)

997: no usual hour

AHOURS_a [Ask if AHOURS = 997]

Please give me your best guess of the average hours you worked per week over the last month.

(Interviewer note : If on holiday during this time, refer to the weeks when not on holiday)

..... hours per week (to nearest hour)

ASECNDJOB [Ask all]

Besides your job at <name of employer>, do you have any other paid jobs?

1. Yes
2. No

AMAINJOB [Ask if ASECNDJOB=1]

Is your job at <name of employer> your main paid job?

(Interviewer note : If in doubt, the main job is the one from which you earn most money.)

1. Yes
2. No

AJOBSAT [Ask all]

All in all, how satisfied are you with this job?

1. Very satisfied
2. Satisfied
3. Not very satisfied
4. Not at all satisfied

Section B: Work organisation

BSUPERVISE [Ask all]

Do you supervise or manage the work of other employees?

1. Yes
2. No

BWRKGROUP [Ask all]

In performing your tasks, do you ever work together in a permanent or temporary team? (Interviewer note: People could be from your firm [organisation] or from another firm [organisation].)

1. Yes
2. No

[Ask BWRKGROUP_a-BWRKGROUP_g if BWRKGROUP=1]

Interviewer introduction: For the following set of questions, think of the team or group you work with most often.

BWRKGROUP_a

Where do the other members of your team come from?

1. Only from within your own firm [organisation]?
2. Only from other firms or organisations?
3. From both your firm [organisation] and other firms or organisations?

BWRKGROUP_b

Does this team have a team leader?

1. Yes
2. No

BWRKGROUP_c [Ask if BWRKGROUP_b=1]

Can the team members influence the selection of the team leader?

1. Yes
2. No

BWRKGROUP_d

Can the team members influence the work targets for the group?

1. Yes
2. No

BWRKGROUP_e [If BWRKGROUP_b = 1]

Excluding the team leader, can the others in this team influence what tasks you do yourself?

1. Yes
2. No

BWRKGROUP_f [If BWRKGROUP_b = 1]

Excluding the team leader, can the others in this team influence how you do your own tasks?

1. Yes
2. No

BWRKGROUP_g

How much of your time at work is spent working with a team?

(Interviewer: if they state '25%' or '50%', code to 2 and 3 respectively, etc.)

1. Less than 25% of your time
2. 25% up to 50% of your time
3. 50% up to 75% of your time
4. 75% or more of your time

BGROUPCHG [Ask all]

Since [enter month two years ago/ or, if AJOBTENURE < 2 years, enter "you started working for <name of employer>], has the amount of time you spend working in teams increased, decreased, or stayed the same?

1. Increased
2. Decreased
3. Stayed the same

BQUALMON [Ask all]

Thinking of your job as a whole, who usually monitors the quality of your work? You may answer yes to one or more of the following:

[Rotate order of questions randomly]

- a. You yourself
- b. Your supervisor or manager
- c. The team you work with most often [Ask if BWRKGROUP=1]
- d. A person from a separate department
- e. Customers or clients

1. Yes
2. No

BTASKREC [Ask all]

Are the tasks that you perform in your job recorded by a computerised system? Exclude simple time keeping or the number of hours you work with word processing or other software programmes.

1. Yes, all tasks recorded
2. Yes, some tasks are recorded
3. No

BWRKASSIS [Ask all]

Sometimes people want to get assistance with a work overload or difficult situation. Do you ever feel the need for assistance?

1. Yes
2. No

BWRKASSISa [Ask if BWRKASSIS=1]

In these situations, how often do you receive assistance from your supervisor or manager?

1. Always
2. Sometimes
3. Never
4. Not applicable

(Interviewer note: A 'not applicable' answer is only correct if the respondent does not have a supervisor or manager)

BWRKASSISb [Ask if BWRKASSIS=1]

In these situations, do you receive assistance from other co-workers?

1. Always
2. Sometimes
3. Never

BTARGETSa [Ask all]

In your work, do you set targets related to quantity? For example, for sales, the number of products produced, or the number of customers served.

1. Yes
2. No
3. Not relevant to my job

BTARGETSb [Ask all]

Do you set targets related to quality? For example, percent of defaults or customer satisfaction.

1. Yes
2. No

BTARGETSc [Ask if BTARGETSa and BTARGETSb=1]

Is it sometimes impossible to reach both the quality and quantity targets?

1. Frequently
2. Sometimes
3. Never

BSTANDARDSCHG [Ask all]

Since [<enter month> two years ago/ or, if AJOBTENURE < 2 years, enter "you started working for <name of employer>"], have these targets become easier to reach, more difficult to reach, or has there been no change?

1. Easier to reach
2. More difficult to reach
3. No change

BFORLANG [Ask all]

Does your job require you to write or speak a foreign language, that is, a language other than [<enter national language(s)>]?

1. Yes
2. No

BFORLANGa [Ask if BFORLANG=1]

How often do you use a foreign language as part of your work?

1. Less than 25% of the time
2. 25% up to 50% of the time
3. 50% up to 75% of the time
4. 75% or more of the time

BFORLANGb [Ask if BFORLANG=1]

Which foreign languages do you use as part of your work?

Record verbatim response

(Interviewer note : If various foreign languages are used, specify the most frequently used one)

BWEFFORT [Ask all]

How often does your job involve working to tight deadlines or at very high speed?

1. Less than 25% of the time
2. 25% up to 50% of the time
3. 50% up to 75% of the time
4. 75% or more of the time

BCHGWEFFORT [Ask all]

Thinking of your job [<enter month two years ago/ or, if AJOBTENURE < 2 years, enter “when you started working for <name of employer>], **how often did your job involve working to tight deadlines or at very high speed?**

1. Less than 25% of the time
2. 25% up to 50% of the time
3. 50% up to 75% of the time
4. 75% or more of the time

BWAWAY [Ask all]

Does your job ever involve working in places other than [<enter name of employer>]’s premises?

1. Yes
2. No

BWAWAYa [Ask if BWAWAY=1]

How much time do you spend working at places other than [<enter name of employer>]’s premises?

1. Less than 25% of the time
2. 25% up to 50% of the time
3. 50% up to 75% of the time
4. 75% or more of the time

BCHGAWAY [Ask all]

Compared to [in <enter month> two years ago/ or, if AJOBTENURE < 2 years, enter “when you started working for <name of employer>], **has the amount of time you spend working at places other than** [<enter name of employer>]’s premises:

1. Increased?
2. Decreased?
3. Stayed approximately the same?

BWAWAYb [Ask if BWAWAY=1]

When working away from <name of employer>’s premises **do you use a computer as part of your job?**

(Interviewer note: This can include, for example, laptops or electronic notebooks)

1. Yes
2. No

BWAWAYc [Ask if BWAWAYb=1]

Can you access the company IT system, when working away from <enter name of employer>’s premises?

1. Yes
2. No

BCIRCLE [Ask all]

Are you involved in a group of employees who meet regularly to think about improvements that could be made within [<name of employer>], **for example a problem-solving or service-improvement group or a quality circle?**

1. Yes
2. No

BWORKPRES [Ask all]

Are any of the following important in determining the pace of your work:

[Rotate order of questions randomly]

- a. Clients or customers?
- b. Supervisor or manager?
- c. Your co-workers?
- d. Your own discretion?
- e. Pay incentives?
- f. A computer or computer system?
- g. A machine or assembly line?
- h. Targets you have been set?

1. Yes
2. No
3. Not applicable

(Interviewer note: For question b, the ‘not applicable’ only applies if a respondent does not have a supervisor or manager)

BUSECOMP [Ask all]

Do you ever use a computer at work?

(Interviewer note : Interviewer to explain, if asked, that a computer refers to the use of personal computers, micro-computers, mini-computers, mainframe computers or laptops. It does not include the use of other equipment such as sales terminals, scanners, or machine monitors.)

1. Yes
2. No

BCOMPTIME [Ask if BUSECOMP=1]

What proportion of your time do you spend using a computer?

1. Less than 25% of the time
2. 25% up to 50% of the time
3. 50% up to 75% of the time
4. 75% or more of the time

BCOMPLVL [Ask if BUSECOMP=1]**What level of computer use is needed to perform your current job?**

(interviewer note: Code only the highest. Code null if respondent says doesn't use computer at all.)

1. Basic – For example, data entry or sending and receiving e-mails
2. Moderate – For example, word-processing, spreadsheets, database use
3. Advanced – For example, computer aided design, software development, statistical analysis packages or managing computer networks

BCHGCOMPTIME

Compared to [<enter month two years ago/ or, if AJOBTENURE < 2 years, enter "you started working for <name of employer>"], **has the amount of time you spend using a computer for your job :**

1. Increased?
2. Decreased?
3. Stayed approximately the same?

BDATABASE [Ask if BUSECOMP=1]

Do you have access to a central database in the course of normal duties ?

1. Yes, but I have only rights to read the information ('read-only')
2. Yes, I can read data and add or modify documents on the database
3. No

BCONOUT [Ask all]

How often are you contacted by phone or in person on work related matters outside your usual working hours?

1. Every day
2. At least once a week
3. At least once a month
4. Less often than once a month / never

BJOBROT [Ask all]

Have you been trained by your current employer to undertake more than one job requiring different skills?

1. Yes
2. No

BCHANGES [Ask all]

Since [<enter month two years ago/ or, if AJOBTENURE < 2 years, enter "you started working for <name of employer>>], **have any of the following changes taken place in your workplace?**

- a. Implementation of new or significantly changed machines, techniques or ICT systems
 - b. Relocation of any employees
 - c. Implementation of a new or significant change in the method of work
 - d. Introduction of a new or significantly changed product or service
1. Yes
 2. No

BCHANGESb [Ask if any BCHANGES=yes]

Did any of these changes have a significant impact on your tasks and duties?

1. Yes
2. No

BCHANGESc [Ask if BCHANGESb=yes]

In general, is your point of view about the consequences of these changes:

1. Positive?
2. Negative?
3. Neither positive or negative?

BJOBRISK [Ask if one or more of BCHANGES=1]

Were you at risk of losing your job as a result of any of these changes?

1. Yes
2. No

BINVOLVEa [Ask if one or more of BCHANGES=1]

I now want to ask you about your level of involvement that you had in the decisions about the change(s) :

Did you personally take part in deciding the change(s)?

1. Yes
2. No

BINVOLVEb [Ask if BINVOLVEa=2]

Did you personally take part in negotiating the change(s)?

1. Yes
2. No

BINVOLVEc [Ask if BINVOLVEb=2]

Was a trade union or works council involved in negotiating the change(s)?

1. Yes
2. No

BINVOLVEd [Ask if BINVOLVEc=2]

Were you personally consulted on the change(s)?

1. Yes
2. No

BINVOLVEe [Ask if BINVOLVEd=2]

Were you personally informed of the change(s) before they were introduced ?

1. Yes
2. No

BINVOLVSAT [Ask if one or more of BCHANGES=1]

How satisfied were you with your level of involvement in decisions about the changes?

1. Very satisfied
2. Satisfied
3. Not very satisfied
4. Not at all satisfied

Section C: Participation and Control

CMANMEET [Ask all]

At your workplace, does management organise meetings where you are personally informed about what is happening in the organisation?

1. Yes
2. No

CMEETVIEWS [Ask all]

At your workplace, does management hold meetings in which you can express your views about what is happening in the organisation?

1. Yes
2. No

CEXPVIEW [Ask if CMEETVIEWS=1]

At these meetings, can you express your views about the following work issues:

- a. Planned changes in working methods?
 - b. Planned changes in products or services?
 - c. Health and safety issues?
 - d. Training plans?
 - e. The investment plans of your firm [organisation]?
 - f. The financial position of your firm [organisation]?
 - g. The environmental impacts of your firm [organisation]?
1. Yes
 2. No
 3. Not applicable

CMEETIMPACT [Ask if CMEETVIEWS=1]

Does expressing your views in such meetings ever have any effect on what is done?

1. Yes
2. No

CMEETCHG [Ask all]

Compared to [<enter month two years ago/ or, if AJOBTENURE < 2 years, enter "you started working for <name of employer>>], has the amount of time you spend in meetings:

1. Increased?
2. Decreased?
3. Stayed the same?

CUNIONMEM [Ask all]

Are you a member of a trade union or staff association?

1. Yes
2. No

CUNIONMEML [Ask all]

Were you a member of a trade union or staff association [<enter month two years ago>]?

1. Yes
2. No

CAUTC [Ask all]

In your job, what proportion of the time can you choose or change the content of your work tasks?

1. Less than 25% of the time
2. 25% up to 50% of the time
3. 50% up to 75% of the time
4. 75% or more of the time

CAUTS [Ask all]

What proportion of the time can you choose or change the speed at which you work?

1. Less than 25% of the time
2. 25% up to 50% of the time
3. 50% up to 75% of the time
4. 75% or more of the time

CAUTU [Ask all]

What proportion of the time can you choose or change the order in which you undertake tasks?

1. Less than 25% of the time
2. 25% up to 50% of the time
3. 50% up to 75% of the time
4. 75% or more of the time

CAUTH [Ask all]

What proportion of the time can you choose or change how you undertake tasks?

1. Less than 25% of the time
2. 25% up to 50% of the time
3. 50% up to 75% of the time
4. 75% or more of the time

CAPPRAISE [Ask all]

Over the past year [or if JOBTENURE_b < 12months start with "Since you started working for <name of employer>"], **have you participated in a performance appraisal or evaluation interview?**

1. Yes
2. No

CAPPRES [Ask if CAPPRAISE=1]

Did the results of your performance appraisal directly affect:

- a. Your level of pay?
- b. Your promotion prospects?
- c. Your training opportunities?

1. Yes
2. No

CJOBLIKE [Ask all]

To what extent do you agree or disagree with the following statements about working for [<enter name of employer>?]

- a. I share many of the values of <enter name of employer>
- b. I do not feel loyal to <enter name of employer>
- c. I am proud to tell people who I work for
- d. I am willing to work harder than I have to in order to help <enter name of employer> succeed

1. Strongly agree
2. Agree
3. Disagree
4. Strongly disagree

Section D: Skill Utilisation

DEDGETJOB

If applying today, what would be the minimum educational level someone would need to get this job?

Record verbatim statement of education achievement.

(Interviewer note: If interviewer unsure of level of achievement stated probe further: what level of achievement is this equivalent to? Interviewer then lists appropriate ISCED-97 levels. The response is to be subsequently coded to the highest level of ISCED-97 post-interview. Achievements should include vocational qualifications.)

ISCED-97 levels

- 1 ISCED 0 and 1 = Pre-primary or primary
- 2 ISCED 2 = Lower secondary level
- 3 ISCED 3 = Upper secondary level
- 4 ISCED 4 = Post-secondary, non-tertiary level
- 5 ISCED 5B = Programmes at the tertiary level that focus on practical, technical or occupational skills for direct entry into the labour market.
- 6 ISCED 5A = Programmes at the tertiary level equivalent to university programmes.
- 7 ISCED 6 = Advanced research programmes at the tertiary level.

DEDDOJOB [Ask all except if DEDGETJOB=1]

Is this level of education necessary to acquire the skills to perform your job satisfactorily?

1. Yes
2. No, a lower level of education would be sufficient

(Interviewer note : If says higher level necessary, code Yes).

DWKEXPJOB [Ask all]

If someone were hired or promoted to this job, how much related work experience would be required to get the job?

1. Less than a month
2. One month to one year
3. One year up to three years
4. Three years up to five years
5. Five years or more

DOVERSKILL [Ask all]

Do you feel that you have the skills to cope with more demanding duties than those you are required to perform in your current job?

1. Yes
2. No

DLRNNEW [Ask all]

How often does your job involve learning new things?

1. Every day
2. At least once a week
3. At least once a month
4. Less often than once a month / never

DHELPWORKER [Ask all]

How often does your job involve helping your co-workers to learn new things?

1. Every day
2. At least once a week
3. At least once a month
4. Less often than once a month / never

DPROBSOLVE [Ask all]

In your work, are you ever confronted with new or complex problems that take at least 30 minutes to find a good solution? Only consider the time needed to **THINK** of a solution, not the time needed to carry it out.

1. Yes
2. No

DPROBSOLVEa [Ask if DPROBSOLVE=1]

How often are you confronted with such a complex problem in a typical work week?

1. Less than once per week
2. Once a week
3. Two to five times a week
4. More than five times a week

DINNOVBEH

Since <enter month last year>, have you:

- a. Figured out solutions for improving areas of your own work?
 - b. Thought up new or improved products or services for <enter name of employer>?
 - c. Tried to persuade your supervisor or manager to support new ideas ?
1. Yes
 2. No
 3. Not applicable

(Interviewer note: Not applicable only applies to part c, and only if the respondent does not have a supervisor or manager)

DTRAINED [Ask all]

Since [<enter month two years ago/ or, if AJOBTENURE < 2 years, enter "you started working for <enter name of employer>], have you taken any of the following types of training or education in connection with your current job? Include both training and education paid for by your employer and paid for by yourself, as long as it was related to your work.

- a. Received instruction or training during work hours which took you away from your normal job
 - b. Received instruction whilst performing your normal job
 - c. Followed a correspondence or Internet course
 - d. Taught yourself from a book, manual, video or computer
 - e. Taken an evening class
 - f. Done some other work-related training
1. Yes
 2. No

DTRAINTIME [Ask if at least one option to DTRAINED=1]

Between [<enter month two years ago/ or, if AJOBTENURE < 2 years, enter "when you started working for <enter name of employer>] and now, how much time did you spend in all types of training and education related to your current job?

1. Less than one week
2. Approximately one week
3. Approximately two weeks
4. Approximately three weeks
5. Approximately four weeks
6. Over four weeks

DUNDERSKILL [Ask all]

Have you received enough training in order to carry out your present duties well?

1. Yes
2. No

DSKILLCHG [Ask all]

How would you compare the level of skills needed for your current job today with the level needed for the same job [<enter month two years ago/ or, if AJOBTENURE > 2 years, enter "when you started working for <enter name of employer>]?

1. Increased
2. Decreased
3. Stayed the same

Section E: Working time and work life balance

EOVERTIME [Ask all]

Have you worked overtime, paid or unpaid, in the last year?

1. Yes
2. No

EOVERTIMEa [Ask if EOVERTIME=1]

Have you been compensated for any of this overtime?

1. Some or all of it compensated
2. None compensated

ECHOICE [Ask all]

Can you normally choose the amount of overtime hours you work?

1. Yes
2. No
3. Not applicable (no overtime offered)

EREFUSE [Ask if ECHOICE=1]

Does repeated refusal of overtime hours affect your promotion prospects?

1. Yes
2. No

ECHOOSETIME [Ask all]

Can you choose the times at which you begin or finish your daily work?

1. Yes
2. No

ECHOOSSEDAYS [Ask if AFULLTIME=2]

Can you choose the days you work?

1. Yes
2. No

EHOLIDAY [Ask all]

How many days of paid holiday are you entitled to per year? Please exclude public holidays.

..... days per year

(Interviewer note: Take an approximate answer if respondent is unsure of exact number. If answer is given in weeks, multiply by 5 to gain days; if "indefinite" code 100 days.)

Section F: Employment security

FLOSEJOB [Ask all]

What do you think is the percent chance that you will lose your job during the next 12 months? That is, be made redundant, not have your contract renewed, or get fired.

..... %

(Interviewer note : 0% (no chance) – 100% (absolute certainty); encourage respondent to give best estimate)

FGETNEWJOB [Ask all]

If you were to lose your job in the next 12 months, what is the percent chance that the job you eventually find and accept would be at least as good as your current job?

-- %

(Interviewer note : 0% (no chance) – 100% (absolute certainty); encourage respondent to give best estimate)

Section G: Employee well-being

GWELLB_{a-f} [Ask all]

Now, specifically thinking about your job with [<enter name of employer>], in the past week how much of the time has this job made you feel each of the following:

- a. Tense?
 - b. Uneasy?
 - c. Worried?
 - d. Depressed?
 - e. Gloomy?
 - f. Miserable?
1. Never
 2. Less than 1 day
 3. 1-2 days
 4. 3-4 days
 5. 5-7 days

GABSENCE [Ask all]

Over the past year

[< or if AJOBTENUREC < 12 months start question with "Since you started working for <enter name of employer>>], how many days were you absent from work because of poor health?
.....days

GABSREASON [Ask if GABSENCE>0 and GABSENCE<367]

Of the days of absence, were any attributable to accidents or other health problems caused by your work?

1. Yes
2. No

Section H: Background Demographics

HSEX [Ask all]

Now I just need to confirm, whether you are male or female?

1. Male
2. Female

[Interviewer to use discretion as to whether it is necessary to ask this question or just enter the appropriate code.]

HAGE [Ask all]

May I ask how old you are?

.....years

HBORN [Ask all]

In which country were you born?

Record verbatim answer

HBORN_b [Ask if HBORN not this country]

How long ago did you first come to this country?

1. Within the last two years
2. 2-5 years ago
3. 6-10 years ago
4. More than 10 years ago

HMINORITY [Ask all]

[This question should only be asked if considered acceptable in each country]

Do you belong to a minority ethnic group in [<enter name of country>]?

1. Yes
2. No

HCOHABIT [Ask all]

Are you currently living with a spouse or partner?

1. Yes
2. No

HSPSEJOB [Ask if HCOHABIT=1]

Is your spouse or partner employed?

1. Full time
2. Part time
3. Not in paid employment

HCARE_{a-c} [Ask all]

Are there any people living in your home who are dependent on you for care? This could be:

a) Children under 18?

1. Yes
2. No

b) Disabled people?

1. Yes
2. No

c) Senior citizens ?

1. Yes
2. No

HCHILDCARE [Ask if HCAREa=1]**Does your employer provide any of the following :**

- a. Information about childcare provision and availability?
 - b. Childcare at your workplace?
 - c. Subsidised childcare?
 - d. Other help with childcare?
1. Yes
 2. No

HEDU [Ask all]**What is the highest level of education or training that you have successfully completed?**

Record verbatim statement of education achievement.

(Interviewer note : If interviewer unsure of level of achievement stated probe further: what level of achievement is this equivalent to? Interviewer then lists appropriate ISCED-97 levels.

The response is to be subsequently coded to the highest level of ISCED-97 post-interview. Achievements should include vocational qualifications.)

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- 6 ISCED 5A = Programmes at the tertiary level equivalent to university programmes.
- 7 ISCED 6 = Advanced research programmes at the tertiary level.

[Countries are free to rephrase the question in order to obtain the same concept efficiently]

HWEXP [Ask all]**Since leaving full-time education, how many years in total have you been in paid work?**

-- years

(Interviewer note : Interviewer to record number of years in total. Exclude any time away from work due to factors such as childcare or long term sickness. Exclude any paid work done before leaving full-time education. Record to nearest year.)

Section I: Wages**IREMUN** [Ask all]**Over a full year, does your pay include :**

- a. Basic fixed salary or wage?
 - b. Piece rate payments?
- (Interviewer Note : Piece rate payments are those payments that are directly determined by the amount of goods or services you make or provide, rather than by the number of hours worked. This may be known as something else in different countries, so word option b in whatever way is best when translating)
- c. Other incentives, bonuses, or commissions related to your own performance?
 - d. Incentives related to the performance of any team or group you belong to?
 - e. Incentives related to company profits?
1. Yes
 2. No

IWAGE [Ask all]**How much do you get paid each month for your job here, before tax and other deductions are taken out? Please include any incentive payments.**

(Interviewer note: if respondent says that pay varies from month to month ask him/her to think about what he/she earns on average. Even if paid weekly, respondents should report their monthly earnings. Respondents to be encouraged to provide their best guess.)

[Designer note: The response scale should comprise 10 intervals which will be specific to each country. In each interval, the upper bound is the 1st, 2nd, 3rd ... 9th decile of the distribution of gross monthly earnings in the country, given to the nearest 50 Euros or equivalent. The top interval should be open-ended, with the 9th decile as its lower bound. These decile points need to be computed from national sources prior to the programming of the questionnaire. As in the rest of the questionnaire, 'Don't know' and 'Refused' should be coded, but not read out]

Section J: Permission to Return and Administrative Records**JINFCON** [Ask all]

In one or two years' time the research team would like to contact you again about your job to see how things have changed. You could decide then whether you would be willing to take part.

Would you be willing for [<enter the name of the research team or national statistical office as appropriate>] **to contact you again in one or two years?**

1. Yes
2. No

JEMAIL [ASK IF JINFCON=1]

Thank you. Do you have an e-mail address that I can take?

This is just to help with recontact in case of change of address or telephone number. It will not be used for any other purposes, and it will be kept securely and in complete confidentiality by the research team.

(ENTER E-MAIL ADDRESS AND READ IT BACK TO RESPONDENT TO CHECK BEFORE MOVING ON OR CODE 'NULL' IF NO E-MAIL OR 'REF' IF REFUSED. ONLY RECORD ONE E-MAIL ADDRESS)

[Countries can also include other items to aid future tracing, if JINFCON=1]

JADMREC

[Note: Countries wanting to match data to administrative records should add a question at this point.]

Chapter V

Methodologies for surveys of employers and employees

Contributors

The preparation of this chapter was co-ordinated by John Forth (National Institute of Economic and Social Research, UK).

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I. Introduction

Chapter II of the MEADOW Guidelines sets out a general framework for a linked survey of employers and employees. This chapter of the Guidelines discusses in more detail some of the practicalities of administering surveys of employers and employees. It draws on the survey methods literature and the experience of the consortium in order to identify methodological options and best practice in the following areas, which represent the broadly-chronological stages of a survey:

- Sampling
- Contact
- Response
- Data collection
- Data preparation
- Data analysis
- Data dissemination.

The chapter does not attempt to cover the issues of questionnaire design or question development to any detailed degree. These issues are the primary concern of chapters III, IV and the synthesis report on questionnaire testing. Furthermore, this chapter does not attempt to provide a general overview of survey methodology; overviews of this type can be found elsewhere (see, for example, Groves, 2004; Groves et al, 2002; Groves et al, 2004; Harkness et al, 2003a). Instead, the principle aim of the chapter is to present a summary discussion of the practical issues that will be faced when seeking to administer surveys of employers and employees, as opposed to surveys of the general population. It is expected that the chapter will also provide a framework which might serve as the starting point for making design-related decisions when seeking to implement any prospective survey in a particular country.

The framework set out in Chapter II is prescriptive in certain fundamental principles. Specifically, it proposes employer and employee surveys – preferably linked to one another – in which the target populations have been defined equivalently across countries and in which the surveyed units have been sampled with known and appropriate precision. It also proposes to measure a consistent set of items across all countries. In other areas, chapter II is less prescriptive, offering only suggestions of how certain practicalities might be addressed, and acknowledging that a certain degree of flexibility will often be necessary. This principle of flexibility within prescribed limits is an important one. The current chapter does not seek to adopt one fixed design and then evaluate its applicability across the EU-27. Instead, one of the important lessons from existing cross-national surveys is that a “one size fits all” approach is often extremely difficult to implement in more than a few countries, because countries differ in their statistical and legal infrastructure and their research experience. Instead, most international surveys incorporate some degree of flexibility in their methodology (see, for example, Bielski and Reidmann, 2005; European Social Survey, 2007; Parent-Thirion et al, 2007). This can be accommodated as long as the fundamental principles are adhered to such that the outputs from each country can be harmonised. One of the purposes of this chapter is to identify those instances in which flexibility may be necessary and also appropriate.

The chapter proceeds in three main sections. Section II addresses the issues confronted in sampling. Section III considers the matter of contacting sample members and collecting data. Finally, section IV discusses methods of data preparation, analysis and dissemination. An appendix presents a summary of international classifications that are applicable for cross-national survey data. The chapter includes illustrations taken from a number of specific surveys. The full name of the survey is always given the first time that it is cited and references are given to further published information where available. Further details on the methodology of many of the surveys that are cited in the chapter are also available from the survey grid reports.¹

II. Sampling

II.1 Introduction

This section provides a more detailed evaluation of the various options for sampling, in which the practicalities, advantages and disadvantages of the alternatives are each set out. We first begin by discussing the quality requirements of a sampling frame. Then we go on to discuss the availability of sampling frames for employer, employee and linked employer-employee surveys within Europe. The next subsection discusses sampling methods, both in broad terms and also, more specifically, in relation to methods of selecting second-stage samples in linked surveys and methods of sampling in longitudinal surveys. Sample sizes are then discussed. The material in these different subsections does, however, assume that the samples of employers and employees will both be created afresh. This may not be necessary because there are a small number of EU surveys already in existence which could provide at least the first-stage sample for a linked employer-employee survey. The possibility of ‘piggy-backing’ on an existing survey is therefore discussed in the last subsection.

II.2 Quality requirements for sampling frames

A primary requirement for any survey is a sampling frame that has comprehensive coverage of the target population and which contains accurate records of any demographic information that is required for sampling. A frame which fails to meet these criteria has the potential to introduce error into survey statistics. And since the sample is the starting point for the survey, frame errors can have a very important influence on the accuracy of the resulting survey.

1) Coverage

The sampling frame for a survey should contain all of the units in the target population, without duplication or inclusion of superfluous units. There are four ways in which frames may deviate from this ideal:

¹ Meadow background document N°2, available at <http://www.meadow-project.eu/index.php?!Article-du-site/Background-documents.html>

Absent units : A form of under-coverage which occurs when some elements of the target population do not appear in the frame population. Most employer-based frames, for example, have difficulty in providing adequate coverage of very small units: a feature which justifies the exclusion of very small units from many employer surveys (as proposed in section IV of chapter II). Employee-based frames, for their part, may be based on residential housing units and thus omit individuals lodging in hotels or boarding houses, or they may be based on residential telephone lines and thus omit individuals without a fixed line.

Superfluous units : A form of over-coverage which occurs when the frame includes elements that are not members of the target population. This will commonly apply in a survey of employees, since most sampling frames are population-based and so include the non-employed or self-employed. The situation will also occur on employer or employee-based frames if they are not purged of members that have ceased to exist (workplaces that have closed down, individuals who have died).

Duplicate units : A second form of over-coverage that occurs when a single member of the target population is represented by more than one element on the sampling frame. The situation may arise when a sampling frame is updated from multiple sources and due care is not taken to identify units that are already present on the frame.

The presence of coverage errors does not necessarily imply that survey estimates will be biased: this depends on whether the absent/aggregate/superfluous/duplicate units differ from the bona fide members of the frame in terms of the characteristics that are being measured by the survey. Moreover, the problems caused by aggregate, superfluous and duplicate units can often be dealt with during the execution of the survey itself (e.g. through sample sifting and subsequent corrective weighting to adjust for the true probability of selection). However, absent units present a non-measurable source of error, and so the absence of particular types of unit should be a particular concern when evaluating the quality – and hence the adequacy – of a particular frame. This is certainly the case in a cross-national survey since the proportion of absent units is likely to vary across countries, even when the cause of absence is the same (Braun, 2003).

2) Demographic information

It is a basic requirement of a sampling frame that it should provide contact details for each sampled unit, or at least some form of identification which enables the desired contact details to be obtained through other means. Telephone numbers will be the primary requirement if the survey is to be carried out by telephone, whilst addresses will be the primary requirement if it is to be carried out face-to-face. This is likely to be the critical issue when choosing between telephone and area-based registers for an employee survey. However, in employer surveys that are carried out face-to-face, the first contact is often made by telephone, if only to ascertain the name of the preferred respondent (to whom an advance letter can then be addressed and mailed). Official business registers may not hold telephone numbers for local units and, in such cases, there may be good reason to prefer telephone-based registers over address-based registers, notwithstanding the issues of coverage noted above.²

² In some countries (such as the UK), it is nevertheless possible to add telephone numbers to a workplace sample with a reasonable rate of success after the sample has been drawn, using matching software.

If the sample design involves the use of certain inclusion/exclusion criteria, the application of stratification or the use of variable probabilities of selection, the frame should also provide the classificatory variables that will enable such methods to be applied. If this information is not provided on the frame, then a screening exercise will be required after drawing a sample in order to determine which units are eligible. For example, few registers that are available for surveys of individuals will include information on their employment status (indeed, registers commonly comprise only of household addresses) and so a screening exercise will often be necessary in an employee-first design to eliminate the non-employed and self-employed. For an employer-first approach, chapter II has recommended that smaller workplaces are excluded from the sample and that units are sampled with probabilities which vary by size (number of employees) and industry, and so these will ideally be available on an employer register. However, commercial registers typically use idiosyncratic and country-specific industry classifications and rarely provide information on the size of the unit and so, again, a screening exercise may be required before the sample can be finalised.

Of course, if these demographic details are available, they must also be accurate if effort is not to be wasted through the use of spurious contact information and if biases are not to be introduced through the use of inaccurate information in sampling. Information on the size of workplaces can be particularly prone to error if the frame is not regularly updated, whilst industry classifications tend to be more accurate as the industrial activity of a unit is less prone to change over time. The frequency with which the frame is updated should therefore be a key concern. Indeed, the regularity with which the sampling frame is updated serves as an important indicator of the likelihood of both coverage errors and errors in the accuracy of the demographic information that is held. However, practice can vary widely. Some registers, such as those deriving from telephone directories, may be updated on a continual basis, but only at the instigation of list members. Others, including many official registers, may be updated also through systematic register inquiries, but only at a fixed interval (say annually).

Every sampling frame will contain deficiencies of one sort or another, since it is impossible to update records on a constantly-changing population in real time. However, some will fail to a larger degree than others, and along more critical dimensions (e.g. absent units). In practice, it is often difficult to judge the quality of a sampling frame *ex ante* as frame owners tend not to publish a wide range of quality measures. This is particularly true of frames which provide samples only as a sideline activity - something that is true of many commercial registers. Quality measures tend to be more widely available in respect of the official registers which are maintained by national statistical offices (NSOs). However, in practice, the best information can often be gleaned from those who have already used the frame for sampling purposes. All such available information should be considered in order to assess the quality of a sampling frame before it is adopted for use.

II.3 Availability of sampling frames

This section discusses the availability of registers of employers and employees in the EU which might serve as sampling frames for surveys in which either the employer or

employee comprises the primary sampling unit (PSU). This acknowledges that flexibility in the choice of PSU may be necessary if one is to achieve extensive coverage across the EU-27. It also acknowledges that the MEADOW Guidelines include survey instruments for both employers and employees – survey instruments which some users of the Guidelines may wish to use independently of one another.

The section begins by discussing the availability of linked employer/employee registers. It was noted in chapter II (sections II and IV) that such registers are available and may be used as sampling frames in some countries. One principal advantage of such frames is that one is not dependent upon the respondent in the primary sampling unit (say, the employer) to provide contact details for the secondary sampling unit (in this case, the employee). If a good-quality linked register is not available, the Guidelines indicate a preference for taking the employer – and specifically the workplace – as the primary sampling unit, with one key reason being that primary sampling at the workplace level (as opposed to the organisation level) makes a second-stage sample of employees easier to achieve. The discussion of linked registers is thus followed by a discussion of the availability of workplace-based sampling frames. Finally, the discussion turns to the availability of employee-based sampling frames, in acknowledgement of the fact that even useable workplace-based frames do not exist in all countries within the EU-27. A later section goes on to discuss the practicalities of obtaining second-stage samples in the absence of a linked employer/employee register.

1) Linked employer/employee sampling frames

As noted above, linked records of employers and employees are available to be used as sampling frames in some countries within the EU-27. One example is France, in which the Déclarations Annuelles de Données Sociales (DADS) – a register compiled from annual employer reports of the names (and salaries) of all of their employees – may be linked to the official business register. Such registers are also available in some Nordic countries, whilst there are other countries – such as the Netherlands and the United Kingdom – in which it would be possible in principle to coordinate sampling from linkable employer and employee registers although such an approach has yet to be applied in practice^{3,4}. In all of the cases cited above, access to the linked registers for sampling purposes must be negotiated with the national statistical office. However, with access to such a register, it would be possible to initiate a linked employer-employee survey in which one did not depend upon the respondent in the primary sampling unit (e.g. the employer) to facilitate contact with the secondary sampling unit (in this case, their employees). This procedure was followed in France in the 1997 and 2006 Organisational Changes and Computerisation (COI) survey and the 2004 REPNONSE survey (see Box 1 below).

³ In the UK, it is possible to link employees' social security numbers (National Insurance numbers) to enterprise identifiers held on the official business register, thus permitting specific employees to be identified within their employing enterprise (as is done for the purposes of the employer-focused Annual Survey of Hours and Earnings). In the Netherlands, it is possible to link the social security register (Sociaal Statistisch Bestand) and jobs register (Banenbestand) to enterprises through the use of the enterprise's Chamber of Commerce reference number.

⁴ Linked datasets giving comprehensive coverage of workplaces linked to their employees are available in a wider range of countries, but many of these have been compiled for analytical purposes and do not constitute frames from which linked samples may be drawn for survey purposes. The linked databases of the Institut für Arbeitsmarkt und Berufsforschung in Germany are one such example.

Box 1: Linked employer-employee sampling in the COI and REPNONSE surveys

In the 1997 and 2006 COI surveys and the 2004 REPNONSE survey, employer units (firms for COI, establishments for REPNONSE) were sampled from the official business register. At the same time, the Déclarations Annuelles de Données Sociales (DADS) register was used to draw random samples employees from the workforce at each of the sampled employer units. This provided samples of employers and employees in which the fieldwork among employees and employers could be undertaken independently, but which could subsequently be linked for the purposes of analysis.

A further advantage of a linked register is that it may permit some flexibility over the level at which the employer survey is administered, since the arguments which favour the workplace-level (in view of the greater ease with which a second-stage sample of employees may be drawn) no longer apply. The French DADS, for example, would permit one to draw a sample of employees linked either to their employing organisation or their employing workplace. However, one limitation is that one would necessarily want to ensure consistency across countries in the unit of observation for the employer survey (whether workplace or organisation-level) if the employer data were to be comparable.

2) Sampling frames for a survey of workplaces

As noted in chapter II, there is not yet a unified employer database at the European level from which one could draw representative samples of employer units for a range of different countries. The European Business Register provides access to the business registers maintained by company registration authorities in many European countries (15 of the EU-27)⁵. Pan-European commercial databases that are largely based on these register data (e.g. AMADEUS) are also available and can be used for sampling purposes⁶. However, the sampling unit in these databases is the company. As noted in chapter II, this is a legal unit, as opposed to a statistical unit, which currently has no common definition across countries. Sampling frames do exist to permit workplace surveys to take place in some (although not all) countries within the EU-27. These frames are of three types: official registers, commercial registers and private registers.

Official registers

In most countries, a permanent official business register is maintained by the national statistical office. Indeed, within the EU this is a requirement of all Member States. Regulation (EC) No 2186/93 required all Member States to draw up one or more harmonised business registers, to be compiled of: all enterprises carrying on economic activities contributing to the gross domestic product at market prices (GDP); the legal units responsible for those enterprises; and the local units dependent on those enterprises⁷. This statistical business register is usually compiled from, and maintained by reference to, one or more administrative business registers (i.e. registers which are created and maintained to support the administration of regulations, such as those relating to business taxation). In some countries, the statistical business register is also maintained by reference to other sources, including commercial registers, in order to maximise coverage, for example by including enterprises that fall below business tax thresholds.

⁵ <http://www.ebr.org/>

⁶ <http://www.bvdep.com/en/amadeus.html>

⁷ A 'local unit' is more or less equivalent to what the Guidelines elsewhere refers to as an 'establishment' or 'workplace'.

The fact that a series of regulations operate to govern the scope and content of official business registers in the EU means that these will usually be of better quality than commercial registers, and also that there will be a greater degree of standardisation across the EU (e.g. in the definition of units and the availability of classificatory information)⁸. Regulation (EC) No 2186/93 requires, for example, that each register entry must include an industry code (four-digit NACE), the number of persons employed in the unit and, for local units at least, the address of the unit and a contact name. The more recent Regulation (EC) 177/2008 further requires that these business registers should cover all economic sectors in the future, including NACE Rev. 1 sections A (agriculture and hunting), B (fishing) and L (public administration). Coverage of these sectors was previously optional. Telephone numbers remain an optional element, however, and this was one of the drawbacks of official business registers noted in the section on demographic information. Data on the age of the unit are also subject to important caveats which are likely to be of relevance to a longitudinal survey (see the last subsection in the section on sampling methods). It should also be noted that Member States can delay their compliance with the regulations after negotiation with the EC. Contacts within Eurostat indicate that there is now almost full compliance with Regulation (EC) No 2186/93, but that as many as six member states have obtained derogations until 2013 in respect of their registers' coverage of public administration (as required by Regulation (EC) 177/2008)⁹. Full coverage of the public sector may therefore still be some years away for the full EU-27.

Another important limitation of official business registers is that the official nature of these registers, and the conditions under which they are compiled and maintained, mean that there are commonly restrictions on access to the register data, for reasons of confidentiality. These restrictions mean that the data are not commonly available for sampling purposes outside of the national statistical office. This is the case in the Netherlands, for example, in respect of the Algemeen Bedrijfsregister (General Statistical Business Register). In other countries, there is limited access. For instance, in the United Kingdom, samples may be drawn from the Inter-Departmental Business Register by central government departments and government contractors. Public access to the official business register for sampling purposes is possible in only a selection of countries, including France, Latvia and Sweden.

It should also be noted that, in some countries, registers of workplaces are maintained by organisations other than the State, albeit in some semi-official capacity. For example, in the Netherlands all economically active workplaces are obliged to register with the local Chamber of Commerce, who then maintains a register with comprehensive coverage outside of agriculture and the public sector. This register is available for sampling purposes.

⁸ Eurostat periodically conducts a survey among member states to gauge the quality of their business registers but this information is not made publicly available, although quality-related information may be published by the national statistical offices in individual member states.

⁹ We are grateful to Arto Luhtio, Head of the Business Register Section in Eurostat unit G1 at the time of our enquiry, for providing this and other helpful information.

Commercial registers

Commercial registers of workplaces come in various forms. One common form is a voluntary register to which businesses subscribe as a means of advertising. Such registers will typically contain separate entries for each of a business' workplaces, and offer both address details and telephone numbers along with an indication of the type of activity (insurance broker, dentist, building services). Since listed companies have a vested interest in keeping their entries up to date, the entries are usually reasonably accurate. Another form of commercial register is a listing of all workplaces with a business telephone line, maintained by the national telecommunications operator. However, the best commercial registers are typically those which derive their entries from multiple sources, including advertising databases, other telephone directories and company registration data (which provides workplace-level data for single-site companies).

The obvious advantage of commercial registers is that they are usually accessible for sampling purposes, albeit on payment of a fee. One drawback, however, is that it may not always be possible to identify a consistently-defined sampling unit, since the entries in a single register may refer variously to whole enterprises or individual establishments (workplaces) without a distinction being drawn between the two. Another important drawback is that commercial registers often tend to have limited coverage of the public sector. In addition, the industry classification may often be idiosyncratic, making it difficult to apply consistent industry-based stratification across different countries, and many commercial registers do not contain information on the number of employees at the workplace, thus inhibiting the use of variable probability sampling by size. It will also be obvious that the form of such registers can vary considerably across countries, since there are no cross-country regulations governing their form as is the case with official registers. A combination of the information provided by Reidmann (2005) and our own enquiries nevertheless indicates that commercial registers of workplaces of reasonable quality are available in a range of countries, including: Denmark (KOB), Finland (BLUE-BOOK/Saleslead), Italy (KOMPASS), Poland (PCM), Spain (SCHOBBER), and the United Kingdom (Experian National Business Database).

Private registers

On occasion, registers of workplaces may also be built up by private research agencies or institutes. Typically, this will be done as part of their own research work, such that the register forms the basis for their own survey research among workplaces. Such registers may not be as complete as official registers. However, they are more likely than commercial registers to provide the demographic information that is needed for sampling. As Reidmann notes (2005, p. 24), one advantage of such registers is that, because the primary purpose of the register is to provide a basis for sampling, the shortcomings of the register for this purpose are usually well known to the owner. It may then be possible to account for those weaknesses in some cases, for example by supplementing the addresses in weak cells using other sources. Reidmann (2005) indicates that good-quality private registers of workplaces are available in Greece (ICAP Business Databank) and Germany (AMS), whilst such a register is also available in the Slovak Republic (Trexima).

Alternative approaches

If it is not possible to access an official register of workplaces in a particular country, and no adequate commercial or private register of workplaces exists, one option is to draw a sample from a register of enterprises and then to seek to enumerate workplaces. This requires that the selected enterprises are each contacted and asked to provide details of each of their workplaces. A random sample of workplaces may then be selected from this list. In the absence of a good-quality workplace register, the European Establishment Survey on Working Time and Work-Life Balance (ESWT) took this approach in Belgium, Cyprus, Czech Republic, Greece, Hungary, Ireland, Luxembourg and Portugal (Reidmann, 2005, pp. 37-40). In each case, the ESWT had access either to the official enterprise-level business register or to a commercial enterprise-level register.

A second approach is to use a commercial workplace register that does not have size or industry information, and then to select workplaces at random and screen them in order to collect these data. Commercial workplace registers are available in most countries, going under the title of Yellow Pages, White Pages or similar. However, the fact that the population of workplaces in any country is typically heavily dominated by very small workplaces means that one would need to make a very large number of contacts in order to identify reasonable numbers of large workplaces¹⁰. The approach is therefore both expensive and time-consuming. For these reasons, it was rejected as a general approach in favour of company-screening in the ESWT (Reidmann, 2005, pp. 40-42). However, in the absence of an enterprise-level register covering the public sector, it was used as a means of sampling public sector workplaces in Belgium, Cyprus, Greece and Luxembourg.

A synthesis of the availability of employer sampling frames

Table 1 below summarises the availability of sampling frames among the EU-27 for a survey in which the workplace is taken as the primary sampling unit. The table assumes that the NSO is not involved in survey sampling. If the NSO were to be involved, then it follows from the earlier discussion that the official business register would provide a sound basis for sampling, with the caveat that coverage of the public sector may not be complete in a small number of countries.

Table 1: Summary of the availability of publicly-accessible sampling frames for a workplace survey in the EU-27

Good-quality workplace register	Other employer register(s) requiring screening exercise prior to survey	No information
Denmark Finland France Germany Italy Latvia Netherlands Poland Slovak Republic Spain Sweden United Kingdom	Austria Belgium Cyprus Czech Republic Estonia Greece Hungary Ireland Luxembourg Portugal Slovenia	Bulgaria Lithuania Malta Romania

Note : Assumes no access to NSO business registers, which would otherwise provide a sample of workplaces in each country (see text for details)

Source : Reidmann (2005), MEADOW consortium

3) Sampling frames for a survey of employees

In common with the situation regarding employer-based sampling frames, it is unfortunately the case that there is no unified database at the European level from which one could draw representative samples of employees for a range of different countries. Yet, sampling frames and sample designs do exist at a national level so that household surveys can take place in all countries within the EU-27. Some countries, such as Denmark, have central population registers that can be accessed for sampling purposes. In other countries where such registers of individuals are not available, household surveys can be based upon comprehensive lists of local residential addresses. Given such a list, it is always possible to employ a 'random walk' procedure which begins at a randomly-assigned starting address within each of a set of pre-defined geographic areas. This approach was used for most countries in the Fourth European Working Conditions Survey (Parent-Thirion et al, 2007). It implies a two-stage sample design with geographical areas as Primary Sample Units (PSU) and addresses or dwellings as Secondary Sample Units (SSU), within the selected areas.

The three options discussed above are considered in more detail below. It should also be noted that an employee-first approach may be conducted by telephone where lists of residential telephone numbers are available. However, such lists typically offer only partial coverage of the population because some households will choose not to be listed in the public directory. Moreover, ex-directory households tend to differ from other households in their demographic characteristics, so that the resulting non-coverage bias is likely to be non-ignorable. The scale of under-coverage is also likely to vary by country. 'Random-digit-dialling' (RDD) methods have the potential to produce representative and unbiased probability samples, but their viability has yet to be demonstrated across Europe (see Nicholaas and Lynn, 2002, for a discussion of their viability in the

¹⁰ This is not the case in the enterprise-based approach described above. As long as the enterprise register contains data on the total number of workplaces in each enterprise and total employment, one can over-sample enterprises with a high ratio of employees to workplaces. These enterprises are likely to include large workplaces.

UK). RDD methods are also increasingly compromised by the proliferation of mobile/cell phones, since sampling and weighting become more complex when there is more than one telephone per household. Telephone-based sampling are thus not considered a viable option at the present time.

National registers

In some countries, national administrative registers provide precise and comprehensive information on *employees*. It might come from a list established for tax or social security, with examples including the Central Population Register in Denmark, which is completed with administrative information for employees, and the Déclarations Annuelles de Données Sociales (DADS) in France, which contains all private sector employers and their employees¹¹. The quality of such data is often excellent (it is regularly checked and updated) but their access is restricted and, as in the case of DADS, their coverage may be limited for administrative reasons: in France, civil servants do not have the same social protection system and are thus not in the same register as other employees.

In other countries, residents lists used for public administration may provide representative samples, e.g. the Central Population Registers in Scandinavian countries (Finland, Norway and Sweden). Here again, information quality is excellent but access is limited. Moreover, as noted in the section “Quality requirements for sampling frames”, such registers imply a requirement for greater survey resources because resident samples include self employed and non employed people as well as employees: if the register does not contain any information on activity status, some screening would be required.

In United-Kingdom (except North of Scotland and Northern Ireland) and in the Netherlands, the national mail companies provide exhaustive lists of *residential addresses*. As with employee and resident registers, such frames contain data of good quality (addresses are regularly checked through their use by mail) and allow one to randomly select a sample at national level. But obtaining a representative sample of employees through a sample of addresses is not easy: first, more than one person may live at a single address, leading to the recalculation of probabilities of inclusion; second, some people may not be linked to any postal address and some others may be linked to several ones (main and secondary residence for instance). In such situations, the recalculation of inclusion probabilities may be quite complicated. Moreover, some difficulties are still to come with the liberalisation by 2011 of the personal private mail activity in the EU.

Local registers or enumeration consolidated in national samples

Given the costs of collecting and maintaining databases with comprehensive and precise information concerning the whole population – and sometimes the legal obstacles that prevent them – the majority of European countries do not have any national registers. In these countries, exhaustive information on dwellings, households or residents is known (or collected) only for small geographical areas, such as groups of dwellings, municipalities or districts, selected through an area sample design (Särndal et al., 1992) with an inclusion probability corresponding to their weight in the global population.

¹¹ The precise coverage of the DADS is all employers and their employees except for: private households with employed persons (NACE 95); extra-territorial bodies (NACE 99); and the State civil service.

In some countries such as France, such information is collected after each Census through a field survey carried out by the NSO’s agents on the randomly selected areas. The database constitutes a representative frame of households called the master sample, from which all the NSO’s national surveys are then selected. But in most countries, local information is only collected at the time of a new survey, which means that sampling frames and data collection are closely linked. It might be done with registers existing in administrative units, municipalities for instance as in Italy. The most common situation – at least for the 2005 LFS – is however a two stage sample using both aggregate and detailed census data: once the geographical areas have been selected as PSU using aggregate census information, detailed census information on dwellings or households (SSU) is used.

Field enumeration

When detailed census data is too old or unavailable, one can proceed to either a complete field enumeration within the selected areas or a random route sample design. Concerning the first option, followed by some countries in the European Social Survey (ESS), Lynn et al. (2007, p. 110) indicate that “the selection stage should be separated from the enumeration and carried out by office staff or supervisors who had not been present for enumeration”. The alternative option, followed by the majority of countries in the European Working Conditions Survey (EWCS) and some in the ESS, plans that within each sampled unit one address is selected by a random method to serve as a starting point and that the interviewer then follows rules specifying the route he or she has to take from there, sampling systematically using a prespecified interval (Hader and Gabler, 2003). As Lynn et al. (ibid, p. 110) mention, such a sample design has to be rigorously controlled by the fieldwork organisation in order to minimise the interviewer influence on selection and thus to ensure that selection is “strictly random”.

These last two options (the use of local registers or field enumeration) have to be considered with attention because they do not need any detailed data coming from official registers and census data. And unless there is direct participation of the NSO in the survey, the accessibility of such information is most of the time problematic (Börsch-Supan and Jürges, 2005, p. 37). Indeed, a two-stage sample design with a selection of geographical small areas corresponding to census clusters, and a complete enumeration of dwellings or a random route procedure within these areas, seems always to be possible in the EU-27. Preferred solutions would of course be (a) to use publicly-available national registers when they exist and are available and/or (b) to obtain the direct participation of the NSO in the sampling operations of the survey. The alternative solutions are likely to require more resources and greater attention in the field because of the need to control the random route. The fact that the alternative solutions also rely on clustered samples means that those samples are likely to be less precise (implying larger standard errors). However, sample clustering can be an advantage for the fieldwork agencies (their interviewer network may not be totally nationwide).

A synthesis of the availability of employee sampling frames

Table 2 below summarises the availability of sampling frames among the EU-27 for a survey in which the employee is taken as the primary sampling unit. As with Table 1, it assumes that the NSO is not involved in survey sampling so as to be applicable to the widest range of potential users.

Table 2: Summary of the availability of publicly-accessible sampling frames for an employee-first approach in the EU-27

Central/local population register	Address register	Area-based approach necessary
Belgium Denmark Estonia Finland Ireland Italy Luxembourg Poland Slovak Republic Slovenia Spain Sweden	Czech Republic Germany Netherlands United Kingdom	Austria Bulgaria* Cyprus* France Greece Hungary* Latvia* Lithuania* Malta Portugal Romania

* Area-based approach assumed in absence of further information.

Note : Assumes no access to NSO registers, which would otherwise provide a sample of workplaces in some countries (see text for details)

Source : Eurostat (2007a: 55); European Social Survey (2007, pp. 55-56); Börsch-Supan and Jürges, 2005, pp. 39-68); MEADOW consortium.

4) Summary

A basic requirement of an international survey is that one obtains samples of employers or employees that are defined equivalently across countries and which have been sampled with known and appropriate precision. This does not, in itself, require the use of an identical sampling strategy in each country (see Kish, 1994), and so the type of sampling frame may vary across countries¹². It will be apparent from the preceding sub-sections that the availability and quality of employer and employee sampling frames differs greatly across the EU-27. Accordingly, some flexibility in the choice of sampling frame is required if extensive coverage of the EU-27 is to be achieved.

At the extreme, the nature of the primary sampling unit – whether employers or employees – may also vary across countries if a varied approach serves to minimise total survey error (although a homogenous approach is more likely to do so and is obviously preferable in terms of simplicity). Sampling methods – including the choice of primary sampling unit – are discussed in the next section.

¹² Indeed, one may even use different types of frame for different sectors of the population within a single country.

GUIDELINE:

Use a linked employer/employee register, if one of good quality is available. Otherwise, use a good-quality workplace-based sampling frame. If neither option is possible, seek to enumerate workplaces from a good-quality enterprise frame, or adopt an employee-first approach. In this way, total coverage of the EU-27 is possible.

II.4 Sampling methods

This section is concerned with methods of selecting a sample once the sampling frame has been chosen. As Kish (1994, p.173) states “sample designs may be chosen flexibly and there is no need for similarity of sample designs. Flexibility of choice is particularly advisable for multinational comparisons, because the sampling resources differ greatly between countries. All this flexibility assumes probability selection methods: known probabilities of selection for all population elements”. Following this statement, an optimal sample design for cross-cultural surveys should consist of the best random practice used in each participating country. The choice of specific design depends on the availability of frames, experience, and of course also the costs in the different countries.

1) Why use a random sample design?

The first, and fundamental, distinction among sampling designs is between probability and non-probability samples (e.g. Cochran, 1977). As stated in Chapter II, these Guidelines strictly recommend using probability sample designs, the only ones that ensure comparability and representativeness, especially in a cross-national context.

A probability sample is drawn from a universe by a well-documented random procedure such that every elementary unit of the universe has a nonzero probability of being selected, and that an inclusion probability (design probability) can be computed for every unit in the sample without using any auxiliary assumptions about the nature of the universe or the properties of the random procedure. As long as those probabilities are known, surveyed units can be appropriately weighted in the analysis phase (each has a weight equal to the inverse of its inclusion probability).¹³ Using a probability sample will then by definition result in a ‘representative’ sample. That is, although not all characteristics of the sample will be identical to the population, in a purely at random sample (with no non-response), deviations between sample and population can only result from sampling errors, and can thus be accounted for with statistical procedures. Furthermore, only a probability sample provides a theoretical basis which allows inferences to be made objectively from the sample to the reference population, either of employees or of workplaces. In contrast, non-probability methods, such as purposive sampling or quota sampling, do not meet the basic requirement that every population unit has a known and non-zero probability of entering the sample. As a consequence, the precision of estimators is impossible to calculate.

¹³ If there is no non-response. Otherwise, weights have to be multiplied by a correcting factor for taking into account non-response. See the later section on ‘Weighting’.

Given all these elements, the first and basic requirement of the sampling design of each participating country is thus that it should produce a probability sample. Then, the choice of a sampling design is ideally an attempt to optimise a target function that balances the properties of estimators in terms of bias and efficiency and the cost of carrying out a survey. Usually this is an optimisation under institutional side constraints determined, for instance, by available sampling frames or by the capacity of field operators. Moreover, the general purpose nature of the survey proposed in the Guidelines makes it difficult to optimise its design towards any particular type of inference or target function. Nevertheless, we discuss some of the available options below.

2) Varying the probability of selection

If every unit in the reference population has a fixed and known probability of inclusion, this probability does not have to be equal for all units and may differ across different strata or classes. Such a design allows one to over- or under-sample some specific sub-populations (classes), and thus to obtain a higher or a lower degree of precision in these classes¹⁴. The approach does, however, require the ability to stratify the sample which, in turns, requires the relevant classificatory information to be available on the sampling frame (see the subsection on demographic information in the preceding section on “Quality requirements for sampling frames”).

One may consider country as the first stratum of the sample design since sampling frames are different in each country (see earlier). And one could decide to commit more or less resources and / or to sample more or less units (employees or employers) in each of these strata. One reasonable objective would be to obtain the same effective sample size in each country, which may imply issued samples which differ in size across countries if response rates or sample precision is expected to vary by country. However, financial and institutional constraints might also play a decisive role. Beside country, the decision as to whether to stratify the sample depends on the PSU: if the employer is the PSU, stratification by size should necessarily be undertaken as a minimum; if the employee is the PSU, stratification is less necessary and, in fact, also less feasible in practice. We discuss each in turn.

Employer-first approach

A sectoral stratification (by economic activity or branch) could be useful if some statistical publication at this level is intended as part of the dissemination of the survey results. In this instance, it may be useful to boost the inclusion probabilities for industries which have only small numbers of employers, so that the achieved sample is of an adequate size for each sector on its own and thus able to support statistically-reliable analysis at sectoral level. More fundamentally, however, it would certainly be necessary to vary the inclusion probabilities by employer size (number of employees) since large units are relatively uncommon in the economy but contribute disproportionately to total employment and economic output. As noted in chapter II, among the 19 million enterprises belonging to NACE classes from C to K (excluding J) in the EU-27 in 2004, more than

17.5 million employed less than 10 employees whereas only 41,000 employed more than 250 employees, yet these larger enterprises accounted for the majority of all employees in the EU. One would thus recommend over-sampling large employers in order to obtain a reasonable number for separate analysis by size sub-group, and also to ensure a reasonable degree of precision for employment-based estimates. As is usual in workplace or enterprise surveys – for instance in the British Workplace Employment Relations Survey (WERS) and the French COI survey – one may adopt a stratified sample where the allocation of employers in a size stratum (e.g. 20-49, 50-99, 100-249, 250-499, 500 and more) is proportional to the corresponding share of employees within the stratum.

If one varies the probabilities of selection across strata, correct estimates of prevalence, standard errors and statistical tests have to be calculated by using ‘counter’-weighting, that is by using weights which are the inverse of the inclusion probabilities (see the later section on ‘Weighting’). This has some significant consequences: given the strongly asymmetric size distribution of employer units, weights will probably be highly spread. And a balance has thus to be found between the necessity to over-sample larger employers, for the reasons set out above, and the requirement to avoid too much dispersion in weights, which is crucial for limiting standard errors.¹⁵ The size strata should therefore not be too numerous, each one should not represent too few workplaces and careful attention should be paid to the dispersion of the inclusion probabilities across strata. Another implication of such stratification is the necessity to have comparable and reliable size and sector variables in the sampling frames. Such variables are often, but not always, available: see the earlier section on ‘Sampling frames’. The very limited availability of other demographic information on employer-based sampling frames is the main reason as to why it is unlikely to be possible to stratify an employer sample by other characteristics (e.g. the extent of outsourcing or use of ICT) which might otherwise enable one to boost the prevalence in the sample of workplaces that have experienced organisational change.

Whatever the difficulties or consequences may be in terms of sampling frames or weights, such stratification of the primary sample at least by size is absolutely necessary in the employer-first approach. In contrast, any employee survey that constitutes the second-stage sample in an employer-first design does not obviously require any stratification. This is fortunate, since it may be difficult in practical terms: one will typically be relying on the employer to provide the list of employees, and the employer is unlikely to be able or willing to provide any additional information that would permit stratification of this list. Instead, the main objective of the sample design for the employee sample in an employer-first design is to obtain a random sample, without any selection bias and with limited non-response; stratification is an additional and second-order concern.

¹⁴ One may also use stratification in combination with equal probabilities of inclusion order to guard against obtaining a sample in which, due to the random nature of sample selection, one obtains very few of certain types of unit. This has the benefit of reducing standard errors.

¹⁵ The standard error of an estimate obtained from a sample design which departs from the principle of simple random sampling – a so-called ‘complex sample’ – differs from the standard error of an estimate obtained from a simple random sample of equivalent size by a factor termed the ‘design factor’ (Lohr, 1999: 239-242). Simple stratification (with equal probabilities of selection across strata) reduces standard errors (giving design factors less than one) whilst the use of unequal probabilities of selection across strata tends to increase standard errors (giving design factors greater than one).

Employee first approach

Stratification by gender, age, geographical background and socio-economic group may be advantageous when the employee is the PSU. But, as shown by the 2005 LFS (Eurostat, 2007a), these items may not commonly be available on employee-level sampling frames. Moreover, stratification along the lines of gender, age and so on is impossible when the sample is based on address lists or an area-based approach. That is why, even if it would be interesting in the context of a survey of organisational change either to ensure a gender, age, geographical or socio-economic stratification or, even better, to over-sample employees in specific situations (for example certain industries, teleworkers, users of the last wave of new technologies or non users of any kind of technology), one would not expect this to be possible. One consequence is that it will be difficult under an employee-first approach to ensure that uncommon types of employer are selected into the sample in adequate numbers (e.g. employers from small industries, workplaces with very large numbers of employees). This is therefore a further reason to prefer the employer as the PSU.

3) Obtaining linked samples in the absence of linked sampling frames

In context of the MEADOW Guidelines it is important to note that representative samples should be established at the level of the employer as well as the employee, and that these samples should ideally be linked together. It will be possible to use a linked sampling frame in some countries (see the earlier subsection on 'Linked employer/employee sampling frames'), but in all others it will be necessary to construct the linked sample in stages during fieldwork.

Given that the randomness and the representativeness of samples are easier to secure at the first stage (the dispersion of sampling rates and the variance of estimates are always higher at the second sampling degree because there are then two sources of non-response, see Ernst, 1989), it is thus crucial to ensure the randomness of the second degree sample. One of the key points of the sample design is thus the way that second-stage samples of employers and employees are selected. As stated in chapter II, an employer first approach is preferred.

The employer first approach

One of the main advantages of taking the employer as primary sampling unit in the absence of a linked sampling frame is that it is easier to survey multiple employees at the second stage of the sample. A natural cluster sample can be obtained, which provides for a practical and efficient means of administering the second stage of fieldwork. This is more so if the surveyed unit is a workplace rather than an enterprise, and this is one critical feature in favour of taking the workplace (rather than the enterprise) as the PSU. In each workplace, the sampling procedure could for instance follow that adopted in the 1998 and 2004 WERS in Britain (see chapter II, table 1) in which the employer is asked to provide a list of all employees at the workplace from which the interviewer selects employees at random (see box 2). A similar procedure was followed by some countries (e.g. Lithuania) in the European Structure of Earnings Survey (ESES).

Box 2: Multi-stage sampling in the British WERS

In the first stage of sampling, a sample of establishments is drawn from the official business register. After the employer interview has taken place, the interviewer asks the employer for a list of all employees at the workplace. This list is checked to ensure that the total number of entries on the list equals the total number of employees at the workplace, as reported by the employer during their interview. The interviewer then selects twenty five employees at random from this list using a random number table. The interviewer then leaves a questionnaire for each selected employee, which may be returned by post.

A cluster sample is the only means of providing for multi-level analysis (one of the aims of the survey, see chapters I and II). Cluster sampling is also simpler and cheaper in terms of data collection as fewer contacts are necessary in the first stage. But, although it is richer for analysis and less expensive, such a sampling method tends to be somewhat less efficient in a statistical sense (Lohr, 1999, p. 132)¹⁶. Moreover, it assumes that a comprehensive and accessible employee list is available within or for each employer unit.

Sampling employees within employer units whilst in the field may lead to some biases. First, employers may not have a list of all their employees or refuse to give it to the interviewer. In WERS 2004, some 14 per cent of workplaces did not allow the second-stage survey of employees to take place¹⁷. Second, employers may try to influence the presumed random selection of employees and, although strict instructions may be given to interviewers in order to ensure the anonymity of surveyed employees, some of them may refuse to answer when fearing for their job security for instance. These situations are not independent from the social climate in the workplace. As stated for the British WERS, when sampling of employees is under volitional control of the employer, workplaces and/or employees experiencing a dispute were found to be underrepresented (Chaplin et al., 2005). And as WERS and REPOSE experienced, biases are likely to be of different strengths in different countries: in Britain, bias is rather limited whereas it has been considered as a real obstacle to obtain robust inferences in France. Some such biases can be corrected after the event (see later section on weighting), but one is unlikely to be able to assess/remove all biases. Accordingly, interviewers should be trained to refuse any kind of employer influence on the selection; they should also note as precisely as possible any information on the way that sampling took place so that afterwards corrections could be made.

Sampling employees within employer units whilst in the field may also lead to some concerns about whether confidentiality can be maintained for employee respondents. This is particularly so in small workplaces or enterprises, particularly if one may be attempting to survey a large proportion of the available workforce. This is a further justification for applying a minimum size threshold of 20 employees in the employer survey (see chapter II): development work for the COI survey in France found that confidentiality could not easily be maintained if the employer had fewer than 20 employees.

¹⁶ The design factor for cluster samples is always greater than one.

¹⁷ In a further 10 per cent of workplaces the survey was allowed but no responses were obtained from employees, which may indicate that the employer dissuaded their workforce from participating.

The employee first approach

Obtaining a linked sample whilst in the field is somewhat more straightforward under the employee-first approach, at least from a sampling point of view. Of course, when the sampled unit is a household, it will be necessary first to select an individual at random from among those eligible to participate in the survey in the household. However, this is quite a common issue in social surveys: following a definition of an employee that is standardised across all participating countries, one may simply use one of the common methods of randomly selecting individuals from a list (e.g. selecting the person with the most recent birthday, as in the 2005 EWCS). Another concern, but also minor, is to effect a random selection of one job from those employees who hold multiple jobs. If this is not done, and the interview is conducted simply about the employee's main job, then employers offering the kinds of positions that are commonly held as second jobs are likely to be under-represented in the second-stage (employer) sample.

In terms of practicalities, the employee would be asked at the end of the interview to provide contact information for their place of employment including business name, address, and telephone number, as occurred in the 2001 British Skills Survey for example and the Families and Employers (EFE) survey in France (see chapter II, table 2 and box 3). As in the employer-first approach when no linked employer/employee register is available, this clearly demonstrates a preference for taking the workplace (rather than the enterprise) as PSU, since an employee is much more likely to be able to provide the contact details for their workplace than they are to know the identity or contact details of its ultimate controlling company.

Box 3: Multi-stage sampling in the British Skills Survey and French EFE survey

Skills Survey : In the first stage of sampling, working individuals aged 20 to 60 were interviewed, based on a random sample of residential addresses throughout Britain. In each selected household one randomly-determined eligible individual was interviewed. All employees were asked to identify their employer and to provide contact details. Interviews were then sought with the most senior manager in each of these establishments.

EFE Survey: The EFE survey targets employees with children. In the first stage of sampling, individuals aged between 20 and 49 were interviewed from a nationally representative sample of households (maximum two interviewees per household). Employees working in establishments with 20 or more workers were asked to provide contact details for their employer and an eight-page postal survey was then sent to the manager of each of these establishments.

A principal advantage of the employee-first approach is to enable coverage of all kinds of establishments (private or public, in all sectors) in a way that does not depend on the availability of a business register and the extent to which it is up-to-date. The main drawback is that one can expect a higher degree of attrition between the first and second-stage samples than can be expected under the employer-first approach. The experience of the French EFE survey (Pailhe, Solaz, 2007, p. 12) and 2001 British Skills Survey suggest that interviewing three employees (face-to-face) leads on average to only one surveyed employer because of the non-responses and the double counts.

A further drawback is that the incidence of certain types of establishment in the achieved sample will be low, specifically those establishments that are relatively uncommon in the economy. This could prohibit some sector-based analysis, for example, since small industry sectors will have few employers in the achieved sample.

4) Sampling for a longitudinal survey

It has earlier been recommended (see Chapter II, especially Figure 1) that although some measures and consequences of organisational change will necessarily have to be investigated with retrospective questions, the survey should preferably involve a longitudinal, panel and/or cohort design in which the same units are surveyed on more than one occasion. It would notably give the possibility to analyse changes over time within organisations.¹⁸ Of course, this implies that the same employer and/or employees are invited to participate in several 'waves' of the survey. If a longitudinal design is to be adopted, this would provide further justification for the employer-first approach, as this would more easily provide a representative sample of employers for each wave.¹⁹

In fact, even with adequate resources and appropriate procedures, there will be an attrition, which means that a proportion of the initial sample is lost in (each of) the following wave(s) since some particular companies, workplaces or employees die or prefer to stop their panel participation after a while. As a consequence, the initial sample has to be large enough to cope with this attrition, both in aggregate and within each stratum (see Smith et al, 2009, pp. 25-26 for a discussion). So the initial sampling is more complex in a panel.

One can avoid ending up with a sample that is too small after one or more follow-ups by setting up a so-called 'open cohort' (as is the IAB Establishment Panel; see also figure 1 in chapter II of these Guidelines). In this case, although all respondents are approached to enter the first and subsequent follow-up waves, the sample is augmented with new participants at every new wave: the panel is refreshed with new employers, some of them being newly created organisations. An additional advantage of this 'open' cohort is that it remains cross-sectionally representative of the population of reference. The refreshment strategy, taking into account birth, death and non-response, has two clear implications. First, the sampling frame must be of sufficient quality and contain sufficient demographic information to allow new units to be reliably identified. Second, careful attention must also be given to the computation of dynamic weights (see later section on data preparation).

¹⁸ Using a panel increases statistical power as each respondent may serve as his own 'control' and each change may be considered to be a 'real' change and not due to sampling another person. Technically, the covariance or correlation between measurements is subtracted from the variance of the difference-score, making it more precise. Of course, this does not apply if, in the case of an organisation or workplace, the respondent changes from wave to wave because of personnel changes.

¹⁹ Although it is possible to compile a random sample of employers after having followed employees in a longitudinal employee-first approach, the sample algorithm and the calculation of inclusion weights would be complex as one would have to account for employees' mobility between employers.

GUIDELINES:

- Utilise random sampling methods
- In the employer-first approach, over-sample large employers and those in small industries, and ensure close control of the second-stage (employee) sampling
- In the employee-first approach, stratify if possible
- Carefully assess likely attrition rates and the qualities of the sampling frame to determine the feasibility of a longitudinal survey

II.5 Sample precision and sample sizes

1) Sample precision

In the general framework of a simple random sampling in an infinite universe, the standard error of an estimate is $\sqrt{(s^2/n)}$ or s/\sqrt{n} , where s^2 is the variance of the item in the sample or sub-sample (French workplaces, Danish employees or Spanish employees in workplaces with 250 to 499 employees, for instance) and n the sample size. This is easiest to demonstrate in the case where the target estimate is a proportion (p) between 0 and 1, as the standard error may then be estimated as $\sqrt{(p*(1-p)/n)}$ (see box 4).

Box 4: Illustrative confidence intervals under the assumption of simple random sampling

With an achieved sample of one thousand units, the 95% confidence interval (CI) for a phenomenon with expected prevalence of 50% would for instance be 46.8% - 53.2%, or $50\% \pm 3.2\%$ ($3.2\% = 1.96 * SE$, for the time being under the assumption of 'simple random sampling')²⁰.

The calculation above assumes an infinite population. In reality, however, the number of employees (and even more, employers) in a country is not infinite. If one samples more than 10 per cent of the population in a stratum, this serves to reduce the standard error (and hence narrows the 95% confidence interval) through the application of a 'finite population correction'. This is likely to be irrelevant when sampling employees in the employee-first approach. But for employers (workplaces or companies), sampling rates are often equal to one for large units in small sectors. And one would thus have to take into account the correcting factor in order to assess the proper sampling precision of estimates.

One must also take account of the impact that unequal inclusion probabilities and clustering can have on estimated standard errors (see footnote 15). Both features of a sample design usually increase the true standard error in comparison with that estimated by the textbook formula noted above. For instance, the WERS 2004 cross-section survey of establishments, which uses unequal inclusion probabilities, has an average design factor of 1.45, indicating that standard errors are, on average, 45% higher than if the same survey had been conducted using simple random sampling (Chaplin et al, 2005, p. 107). The WERS 2004 survey of employees, which is clustered within the survey of establish-

ments, has an average design factor of 1.79 (Chaplin et al, 2005, p. 113). Any attempts to determine minimum sample sizes from the point of view of estimate precision must therefore consider likely design effects for key target parameters. However, this is difficult because the design factor may vary considerably across different estimates, depending upon the correlation of the item in question with the sample inclusion probabilities. This in turn may vary across countries. The only practical way forward is thus to specify general targets by reference to a few key target parameters in an EU-wide survey (such as the ESWT or EWCS).

Moreover, there are considerations other than efficiency. For instance, an imperfect sampling frame or excessive non-response might result in systematic errors that are difficult to compensate for once the survey is completed. In an overall evaluation one might thus find it optimal to reduce the sample size and allocate more resources to preventive measures (like interviewer training, marketing activities etc.) and to non-response follow up (see next part of the chapter on all these points). Note that an increased sample size can never compensate for the bias created by selective non-response. When determining the sample size it is nevertheless important to consider the likely precision of the resulting sample, as described above.

2) Allocating sample units across countries

As indicated in the SHARE project (Börsch-Supan, Jürges, 2005, p. 31), the discussion on sample size does not rely only on sampling theory but also on the best way to allocate resources. And at the first step, one would think about allocation between countries. One may actually aim for a situation in which the precision of country specific estimates of key parameters is approximately the same, or alternatively that the contribution to the variance of an EU-wide estimate from each country is optimised such that the total variance would be as small as possible. Indeed, because the sampling in one country is completely independent of the sampling in another, one can look upon each participating country as a stratum in the universe of participating countries, as noted earlier. It then follows from standard sampling theory that the optimal number of sampling units allocated to a given country is an increasing function of the variance of the estimate of a key parameter and a decreasing function of the marginal cost of collecting another interview from that country.

For instance, as noted again in the SHARE framework, the variance of incomes is much smaller in the North European countries than in the South European countries. Furthermore, good sampling frames based on registers that permit a good-coverage of the reference population and simple and efficient designs are more easily accessible in the North than in the South. Given past experiences of national or cross-national surveys (chapter II), and even if one does not know much about the reasons for national differences, the response rate is also sometimes higher in the North than in the South. That said, the marginal cost of obtaining another interview is higher in the North than in the South.

Considering all these aspects, one would suggest an allocation of resources such that all countries, Germany as Luxemburg, would get the same net sample size (of em-

²⁰ It can be noted that the magnitude of the standard error is greatest for a prevalence estimate of 50% and decreases as the estimate approaches 0% or 100%.

ployers and employees). Only specific objectives (such as a wish to have greater precision in one country, funded with a national financial contribution) or strata saturations (which might occur for large workplaces or companies in small sectors and countries, like Energy in Luxembourg for instance) would lead to the adoption of different sample sizes across countries.

3) Allocating sample units within countries under an employer-first approach

If the employer is the first degree of sampling, the Guidelines suggest stratifying the sample by sector and size (see section II.4 of this chapter). In each country, it is proposed to include from 50 to 100 units per stratum in order to permit minimal statistical analyses by sector and/or size. This would imply probably four or five grouped economic activities (perhaps with one specific stratum for public sector activities) and three or four size classes. This would lead to a minimal net sample size of about 1,000 workplaces or companies in each country, but it could be also a bit less in smaller countries where the productive units are relatively few. Following such an option, the 95% CI for an estimate of 50% from the employer survey in a single country would be around $50\% \pm 4.6\%$, assuming a design factor of 1.45 (the average in WERS 2004). The confidence interval would obviously be wider for sub-samples.

In the existing linked employer/employee surveys that have been reviewed, the chosen maximum number of interviewed employees per employer ranges from 1 to 25 according to the size of the employer unit. When only one employee is chosen, the target could be a “core” employee, fulfilling an “essential task” in the company, but this would not lead to a representative sample of all employees. Some surveys choose to target small samples of employees within each firm (at least 2). It can be shown that if both the employer and employee samples are random, then small samples of employees within each firm are sufficient to assess the influence of employee-based measures on employer characteristics (Mairesse and Greenan, 1999). But with small samples one is inevitably likely to get a substantial number of employers for which no linked employee observations are obtained (due to non-response). Finally, in order to conduct multilevel analyses, achieved samples of at least 15 employees per employer may be needed (Hox, 2002). Hox’s ‘rule of thumb’ would imply the selection of 30 employees per employer, if one were to obtain 15 responses on average, after allowing for a 50 per cent response rate and assuming that every employer participates.

One therefore has a range of possible sample sizes for the second-stage (employee) survey under the employer-first approach. Chapter II of the Guidelines suggests that an average of 2-3 employees should be surveyed within each employer unit. If the total employee sample were thus to number 2,500 employees, the 95% CI for an estimate of 50% from employees in the employer survey in a single country would be around $50\% \pm 3.5\%$, assuming a design factor of 1.79 (the average in WERS 2004).

4) Allocating sample units within countries under the employee-first approach

If the employee is the primary sampling unit, stratification will usually not be possible and so the allocation of sample units across strata is unlikely to be an issue for debate. Instead, the overall size of the sample is likely to be the main consideration. The minimum size of the employee sample will depend in large part on the likely yield of employers, as well as on the desired size of any sub-samples in terms of age, gender, occupation, etc. As noted earlier, experience suggests that interviewing three employees (face-to-face) leads on average to one surveyed employer because of the non-responses and the double counts. So, if around a thousand employers per country are targeted (see before), one would expect to need to survey roughly three thousand employees per country, assuming that this is sufficient to ensure that sub-groups are sufficiently well represented²¹.

In the event that the first-stage (employee) sample is selected at random, the design factor would be 1.0. With a degree of clustering in an area-based approach, one might expect a design factor of perhaps 1.20 for both the employee and employer samples. Under this assumption, the 95% CI for an estimate of 50% from a sample of 3,000 employees in a single country would be around $50\% \pm 2.0\%$, whilst the 95% CI for an estimate of 50% from a sample of 1,000 employers would be around $50\% \pm 3.8\%$.

GUIDELINE:

Seek to obtain an achieved sample of at least 1,000 employers in the employer-first approach and 3,000 employees in the employee-first approach. Such sample sizes should be sufficient to ensure that estimates produced from the full survey sample within any one country are precise with within ± 5 percentage points. Larger samples should be sought where possible in order to achieve reasonable levels of precision also in sub-samples (e.g. private or public sector).

II.6 Practicalities of piggy-backing

The foregoing discussion presupposes that the samples of employers and employees for any EU-wide implementation of the MEADOW Guidelines will be drawn afresh. However, there are a small number of surveys already in existence which could provide the infrastructure for such an implementation.

Piggy-backing on other pre-existing surveys as a strategy for administering an EU-wide employer-employee linked survey on organisational change presents a number of advantages and disadvantages. The principal advantage is reduced cost. Piggy-backing allows one to make use of an existing core survey infrastructure in order to collect data on a set of questions or a module resulting in substantial saving on fixed costs, which represent a major portion of any survey budget. Moreover, compared to

²¹ This would, of course, imply that two-thirds of the eventual employee sample do not have linked employer observations.

²² This should not give the impression that piggy-backing is entirely without additional costs. There are additional marginal costs due to extra questionnaire programming time, interviewer training, interview time, coding and editing.

undertaking a new survey, there are marginal cost savings in terms of reducing the number of questions and the volume of the questionnaire since much of the relevant background information on the survey units will already be included in the core survey²². Depending on the focus of the core survey, a potentially valuable by-product of piggy-backing will be gaining access to a variety of complimentary information on the survey units.

The main disadvantage of piggy-backing on a pre-existing survey, however, is that any potential host survey is likely to be able to afford only limited space to any new module on organisational change, and this may restrict the range of data that can be collected. Furthermore, there are very few existing linked employer/employee surveys in the EU – most of the potential host surveys would provide only the first-stage sample (either employer or employee). Substantial additional fixed and marginal survey costs would still be incurred in carrying out a second-stage survey – although the total cost would of course be lower than if both stages had to be carried out afresh. Unless the host survey incorporates a panel design, which is rare, or would allow for the permanent addition of a module on organisational change, piggy-backing would also be a one-off event which would not provide the infrastructure for carrying out a survey on a periodic basis. Nonetheless, a one-off instance of piggy-backing could provide the means of conducting a full-scale test of the Guidelines.

The most appealing option from a practical point of view is to piggy-back on an existing EU-wide survey. We discuss below the practicalities of piggy-backing on the Labour Force Survey (LFS), the Community Innovation Survey (CIS), the European Company Survey (ECS) and the European Structure of Earnings Survey (ESES). There are other EU-wide surveys of broad relevance, including the European Social Survey (ESS), the European Survey of Income and Living Conditions (EU-SILC) and the European Survey of Working Conditions (ESWC). However, none of these have samples of sufficient size to provide the numbers of observations at national level that are recommended elsewhere in the Guidelines.

In the absence of an EU-wide host, a piecemeal strategy of piggy-backing on different national surveys might offer a means of testing – or fully administering – the MEADOW Guidelines in different national contexts. This option is discussed at the end of this section.

1) European Union Labour Force Survey (LFS)

The European Union Labour Force Survey (LFS) is a quarterly large sample survey covering the population in private households in the EU, EFTA (except Lichtenstein) and Candidate Countries. Piggy-backing on the LFS thus implies taking the employee as the

²² We are basing this on the conservative assumption that only one out of every three employee contacts will result in a valid enterprise address and thus in order to generate a sample of 1,000 establishments in the 20 employee and above size range one needs a sample of 3,000 employees working in establishments in this size range. Even assuming in a random selection of households that each household includes at least one employed person, one can anticipate that approximately 40 percent of the employed persons interviewed will be either self-employed or working in establishments with less than 20 employees. This implies the need for a sample of around 7,000 households. In 2005 the sample size of households was under this range in 6 EU-member nations: Estonia, Cyprus, Latvia, Lithuania, Luxembourg, Malta (Eurostat, 2007a).

first degree and linking up to a new sample of employers. One advantage of the LFS is that it covers all types of economic activity. The sample size of 1.7 million of individuals in 2005 is large but nonetheless may not be sufficient in some smaller EU countries to generate a sample of 1,000 firms in the 20 employee and above size range as proposed in chapter II of the Guidelines²³.

Since 1999 an inherent part of the LFS are the so called ‘ad hoc modules’. Council Regulation No. 577/98 provides for a programme of ad hoc modules covering several years to be drawn up each year, subject to certain conditions concerning the reference period, the sample size, the volume of the module and the transmission of results. The module may have a sample size less than the core survey and the volume of the module should not exceed that of the core. The 2004 ad hoc module was titled ‘Work organisation and working time arrangements’. However, it was for the most part concerned with working time and included only one question on autonomy in work that would be potentially overlapping with the items proposed in the MEADOW Guidelines. Nevertheless, the drawback of the LFS as an option for piggy-backing is that any changes to the survey, however small, result from a process of discussion between Eurostat and representatives of the respective national statistical offices and employment ministries. The decision-making process is therefore complex and the impetus for any substantial changes must inevitably come from a high-level within the European Commission.

2) Community Innovation Survey (CIS)

The Community Innovation Survey (CIS) is a self-completion survey conducted by EU Member States that allows the monitoring of Europe’s progress in the area of innovation. The survey was originally conducted every four years, but since 2005 has been conducted every two. The sample sizes are substantial: the UK Innovation Survey 2007 obtained responses from around 15,000 employers.

A key feature of the CIS is that the enterprise is the statistical unit and thus any module attached to the CIS would have to use the enterprise as the primary sampling unit. But this leaves open the possibility of using the CIS frame as a basis for administering a module at a randomly selected local unit in the event that the primary sampling unit is a multi-unit enterprise. A further feature of the CIS frame is that there is only partial coverage of the service sectors and no coverage of the public sector. Thus, unlike piggy-backing on a household or employee-level survey, such as the LFS, there would be no scope for pursuing the MEADOW Guidelines’ objective of measuring organisational change in the public sector. The CIS now includes explicit provision for additional modules. However, the module must be no longer than one page and so the number of data items that could be collected is limited.

Despite these various drawbacks, piggy-backing on CIS may nonetheless be a productive option for at least a couple of reasons. First, the value of measuring organisational innovation is accepted by the OECD and Eurostat and this could pave the way for the inclusion of a longer module on organisational aspects in the full survey which is carried out every four years. Second, there is increasing interest in the policy community to capture the non-science and technology dimensions of innovation and in particular, within

the OECD, the idea of measuring skills for innovation has been placed on the agenda of the Innovation Measurement Work Group. The MEADOW Guidelines could be presented as the framework for capturing skills and other organisational aspects of relevance to innovation at the employee-level.

3) The European Company Survey (ECS)

The European Company Survey (ECS) is the successor of EPOC and ESWT and a decision has been made at the EFILWC to carry it out on a regular basis. The ECS covers establishments with 10 or more employees in the 15 «old» Member States of the EU and in 6 of the 10 states which newly joined the EU on 1 May 2004 (the Czech Republic, Cyprus, Hungary, Latvia, Poland and Slovenia); it aims for an achieved sample of 1,000 establishments per country (Bielenski and Riedmann, 2005). Interviews are conducted by telephone with the most senior person in the local establishment who is responsible for the personnel at that establishment and, in those establishments where employee representation exists, additionally with one employee representative.

The focus of successive waves of the ECS is not fixed and so – subject to discussions with representatives of the EFILWC – there may exist an opportunity to focus one wave of the survey on organisational change. This could serve as the first degree for linked survey of employees. If this option were to be pursued, the Meadow framework could provide guidance for designing the survey framework.

4) The European Structure of Earnings Survey

The European Structure of Earnings Survey (ESES) provides information on the relationships between the level of employees' remuneration, their personal characteristics (e.g. sex, age, occupation, length of service, educational attainment) and the characteristics of their employer (e.g. economic activity, size, ownership). The survey was first conducted in 2002 and was repeated in 2006. The coverage of the survey extends to enterprises with 10 or more employees in Sections C-K and M-O of NACE Rev 1.1, although individual countries may extend the scope of the survey beyond these limits (Eurostat, 2006a). A small number of countries (e.g. Portugal) satisfy the principal data requirements by reference to administrative records, but most countries undertake a survey in which local units are first sampled and then asked to report upon the earnings of a sample of their employees (Eurostat, 2006b). The achieved sample sizes are typically large, comfortably exceeding the thresholds outlined in Chapter II in many countries. Whilst employees are not surveyed directly in the ESES in most countries, the survey nevertheless provides the sampling infrastructure on which a survey requiring both employer and employee respondents could be based.

5) Piggy-backing on individual national surveys

In addition to the EU-wide surveys discussed above, there are also a small number of national surveys which could provide the infrastructure for an implementation of the Guidelines in some form. Specifically, the British WERS and French REPOSE and COI surveys are each linked employer-employee surveys which can be expected to recur in the future. In addition, there are a variety of recurring employer-only or employee-

only surveys (e.g. the IAB Establishment Panel in Germany and the OSA Employer and Employee Surveys in the Netherlands) which could potentially provide the first-stage sample for such an implementation²⁴.

The surveys typically depart from the Guidelines in some way in terms of their design – and indeed they typically differ from one another (although there are exceptions to this, such as WERS and REPOSE, where efforts at international harmonisation and comparability have been pursued bilaterally²⁵). In addition, such national surveys can also be expected to offer only limited space for new questions. For these reasons, they are highly unlikely to provide a general framework for a survey based on the MEADOW Guidelines. However, one or more national surveys may offer the potential to be used as vehicles for large-scale tests of subsets of questions in specific countries.

GUIDELINES:

- Piggy-backing on the LFS, CIS, ECS and ESES should be explored as a means of providing the infrastructure for the first-stage of an EU-wide implementation.
- Other national surveys should be explored as potential vehicles for large-scale tests.

III. Contact, response and data collection

III.1 Introduction

This section identifies and evaluates feasible strategies for :

- contacting samples of employers and employees (including linked samples);
- gaining their participation in the survey(s); and
- administering questionnaires to these respondents.

These elements of the survey process are intimately linked. For instance, the use of a particular mode of data collection (e.g. telephone interviewing) will require a different method of initial contact than if another mode of data collection is to be used (e.g. postal self-completion questionnaire). Equally, the propensity to respond varies according to the methods that are used for both the initial contact and the administration of the questionnaire. Accordingly, it is relevant to consider these issues together. They are, of course, discussed somewhat separately in the sections which follow. However, the linkages are made clear in the text as far as possible.

The section begins by setting out a framework within which the survey processes of contact, response and data collection take place. This serves to introduce the various components of the response process from the perspective of both employers and employees. The section then goes on to discuss the initial contact phase of a survey. It then discusses the response phase. And finally, it discusses the data collection phase. The response process may be decomposed into a number of constituent elements. The framework outlined below has its origins in the 'cognitive response model' proposed

²⁴ Further details are provided in the survey grid reports: Meadow background document N°2, available at <http://www.meadow-project.eu/index.php?/Article-du-site/Background-documents.html>

²⁵ See <http://www.ptolemee.com/wersreponse/>

by Tourangeau (1984). This model was primarily concerned with the interaction between the survey researcher and the potential respondent and sought to apply principles from cognitive psychology in order to obtain a better understanding of the requirements for a successful interaction. The model has since been developed further, not least by Edwards and Cantor (1991), Sudman et al (2000) and Willimack and Nichols (2001), who each sought to revise the model so that it was more widely applicable to establishment surveys as well as household/individual surveys²⁶. The revised model is sufficiently general that it can prove a useful framework in which to introduce the response process from the perspective of both employers and employees. The components of the model are presented in table 3.

Table 3 : Components of the response process

Component	Critical feature	
1	Encoding in memory, consciousness or records	The information that is sought must be present, either in a person's memory, their conscious mind
2	Selection and identification of the respondent	Those administering the survey must be able to both identify and reach a person who holds / has access to this information
3	Comprehension of the request	The respondent must understand the nature and meaning of the request for data
4	Assessment of priorities	The respondent must weigh the request favourably against other calls upon their time
5	Retrieval of information	The respondent must be able to recall the information accurately, or otherwise must have ready access to records
6	Judgement	The respondent must make a favourable judgement as to whether the information they have retrieved is adequate relative to the meaning of the question
7	Communication	The respondent must be able to communicate the information via the questionnaire
8	Release of data	The respondent must be willing to release the information via the survey instrument, given any concerns about anonymity and confidentiality

Adapted from Sudman et al (2000), Willimack and Nichols (2001).

Elements of the model clearly impinge upon the process of drafting of survey questionnaires, not least items 1, 3, 5, 6 and 7. The content of the survey questionnaires proposed under the MEADOW Guidelines is outlined in chapters III and IV. Nevertheless,

²⁶ The extension of the model to encompass establishment surveys also includes the necessary acknowledgement that the 'respondent' in such cases is a business unit, potentially incorporating multiple people and multiple sources of data, rather than a single individual (Willimack, 2007). The implications are made clear in later sections.

the drafting of individual questions and the collation of those questions into a questionnaire represents just one part of the overall survey exercise. For a survey to be successful, it is also necessary that the desired respondent can be identified (item 2 above), that this person can be motivated to respond to the survey (items 4, 6 and 8) and that their intended response can be effectively communicated via the survey instrument (item 7). The model therefore serves to provide a framework within which contact, response and data collection may be collectively considered.

III.2 Contact procedures

The process of contacting potential respondents is given limited attention within the methodological literature, which tends to be more focused on refusal avoidance and data collection methods. However, the process of contacting a potential respondent from the information provided about the sampled unit is a critical stage that is a prerequisite for any successful survey response. It comprises practical issues, such as how to contact individuals when the sampled unit is a household address or telephone number, and how to contact a role-holder when the sampled unit is a workplace. It also comprises ethical issues, such as how to obtain informed consent from a potential respondent²⁷. These issues are addressed below.

1) Delivering the survey request

The contact phase concerns the phase in which one attempts to deliver the survey request to the desired respondent. In some cases, a sampled unit will directly identify the desired respondent (as is the case when sampling employees from a workplace payroll list in an employer-first design, or when an employee can provide the name and contact details of the general manager at their workplace in an employee-first design). In other cases however, as when the sampled unit is a workplace/household address or general telephone number, it will be necessary to implement an initial screening exercise within the contact phase in order to identify and select the desired respondent, before one can consider delivering the survey request. In an employer-first design for which the sampled unit is simply a workplace, the desired respondent is identified by reference to their role, since chapter II notes that the preferred respondent is the general manager at that location. The first stage of the contact phase thus requires one to obtain this person's name and contact details so that all survey-related enquiries may be directed specifically to him/her²⁸. In an employee-first design for which the sampled unit is a household address or telephone number, one must first randomly select one employee from among those present in the household (as discussed in the earlier subsection on "Achieving a multi-stage sample").

Errors in the information obtained about the sampled unit from the sampling frame can, of course, be one impediment to making a successful contact (e.g. if an address or phone number is out of date), and this is one further reason why it is important to seek

²⁷ The principle of 'informed consent' requires that individuals are provided with a clear and unambiguous statement about the purposes of the research and how their data will be used, and that they are given the opportunity to opt out of the survey and any subsequent uses of the data.

²⁸ Directing survey-related materials to named persons is known to meet with greater success than directing materials to an unnamed role-holder, e.g. The General Manager (Willimack et al, 2002, p. 215).

information on the quality of a sampling frame prior to its adoption. Other impediments to a successful contact include the use of answering machines, voicemail, call blocking services, and the habit among some enterprises of not releasing telephone numbers for workplaces that do not deal directly with customers. Gatekeepers may also prevent the survey request from being delivered, and these are considered in the next section. Socio-demographic factors can also play a role: employee-focused surveys are likely to have more difficulties with the contact phase than general population surveys because employees spend less time at home than the non-employed.

Non-contacts can thus be reduced in a number of ways (see Groves et al, 2004, pp. 170-173, 189-195), including:

- making repeated attempts to contact the sampled unit;
- varying the time of contact (morning / afternoon / evening / weekend);
- lengthening the fieldwork period;
- using well-trained and experienced interviewers; and
- using different modes of contact (a personal visit to an address may yield information that an attempted telephone call cannot).

The European Social Survey employs many of the approaches noted above and also sets challenging target rates for the percentage of non-contacts (see box 5). Its achieved non-contact rates are considerably below those of other pan-European surveys.

Box 5: Minimising non-contacts in the European Social Survey

The European Social Survey (ESS) requires that at least four visits are made to each sampled address, and that these visits are spread over at least two different weeks, and include at least one evening and one weekend call. Although other cross-national surveys tend to experience substantial cross-national variations in non-contact rates, the ESS sets a single target of no more than 3% non-contacts in each participating country and, in Round One, only four out of twenty countries exceeded this limit (Phillipens and Billiet, 2004). In contrast, the 2005 EWCS had an average non-contact rate of 22% (Parent-Thirion et al, 2007, p. 96).

2) Gatekeepers

In an employer survey, it is likely that the initial contact with a workplace will be persons other than the general manager. These persons may be termed gatekeepers because they control access to the desired respondent. Such gatekeepers include reception staff, who control access to the workplace as a whole, and personal assistants or secretaries, who manage the diaries of senior managers. Skill will often be required to negotiate a way past gatekeepers, implying the need for experienced, professional interviewers. However, if they can be brought onsite, they can prove to be a valuable aide and advocate within the workplace.

Gatekeepers may also occupy a more senior role in an enterprise. Managers in certain types of establishment are reluctant to give interviews without referring to head-office managers for authorisation. Large enterprises are likely to have multiple establishments

in the sample, and so this can result in a number of distinct requests being referred to head-office level during the course of fieldwork, which can cause annoyance among senior managers. In WERS and a small number of other well-resourced establishment surveys in Britain, this problem is addressed by making the first approach at head office level in organisations with large numbers of sampled establishments and in those where, irrespective of the number of sampled units, survey participation is known to be subject to head office approval (see box 6). In the past it has been found that, once head office permission is obtained, establishment managers are usually very willing to participate, and so the overall likelihood of obtaining a response is improved by the use of this two-stage procedure. However, the approach is resource-intensive, requiring additional efforts to sort the sample into enterprise blocks and additional layers of correspondence, and thus long lead-times. Therefore, it may not always be practical.

Box 6: Head office approaches in WERS

In the British WERS, the sample is sifted prior to fieldwork and units are categorised into two waves. Wave One units are those that are, or seem to be, independent establishments that are not part of a larger organisation or enterprise, plus all other establishments which, in the experience of the research team, can reasonably be expected to decide whether or not to participate without referring the decision to a higher level in the organisation. These addresses are issued directly to interviewers for them to make the first contact. Wave 2 addresses are establishments that are part of a larger organisation, where there is likely to be little prospect of an interviewer obtaining an interview without prior approval from the head office of that organisation. Responsibility for gaining this approval is taken by office staff at the fieldwork agency, with some assistance from staff within the commissioning government department. See Millward (1992, pp. 150-151). In the 2004 WERS Cross-Section Survey, 34% of issued addresses were classified as 'wave two' units (Chaplin et al, 2005, p. 19).

3) Relying on a single respondent

The preference stated in chapter II for the employer respondent to hold the role of 'general manager' means that the respondent should be broadly knowledgeable about activities at the workplace. However, the scope of the employer survey is wide (see Chapter III) and so it is possible that, in some cases, the 'general manager' may not know all of the detail that is requested. For example, in some cases it may be that some pieces of information can only be provided by another manager at the establishment (e.g. on certain personnel issues), or by a manager at a more senior level in the organisation (e.g. on certain strategic issues). Where this arises, there are two ways to proceed. The preferred approach is that the person identified as 'respondent' takes responsibility for collecting information in readiness for an interview. A 'data sheet' provided in advance of the interview can be useful in this context, as it can be completed by a number of people who each hold parts of the information requested, although it is primarily useful for collating numerical information (see box 7). An alternative approach is to seek to interview more than one person within the same business, either in turn or concurrently. However, this necessarily adds to the cost and complexity of the survey because it requires multiple contacts; it also offers multiple opportunities for a refusal, thereby raising non-response rates, and so is not advised.

Box 7: Use of datasheets prior to interview in WERS

The British WERS uses a data sheet, sent in advance of the management interview, in order to enable the manager to collate information that is likely to require reference to records (e.g. breakdown of the workforce by occupation, hours and gender; absenteeism rate; rate of labour turnover). Managers are strongly encouraged to fill in the data sheet, and do so in around 70 per cent of cases, but interviews do proceed with estimated figures if necessary.

4) Advance letters

Once the desired respondent has been identified and contact has been made, some surveys may then go on directly to seek participation in the study. However, it is good practice to inform participants of the nature of the research in advance of attempting to gain consent (see Groves et al, 2004, pp. 350-66 for a discussion). Indeed, the EU Data Protection Directive (95/46/EC) requires that individuals are provided with a clear and unambiguous statement about the purposes of the research and how their data will be used, and that they are given the opportunity to opt out of the survey and any subsequent uses of the data. The information that a participant needs in order to properly determine whether to participate in a survey may be conveyed in an advance letter.

The provision of one or more advance letters or leaflets can also have other benefits: it legitimises the survey request; it communicates the value of the study; and it can be used to demonstrate how the respondent will benefit from participation (or at least to specify how the survey agency will ensure that they do not come to harm). However, the effectiveness of the advance letter will depend on the letterhead, the signatory and the content (Groves, 2004, pp. 208-213). For example, an advance letter that appears to come from a market research agency may produce an adverse reaction. For this reason, the letter should usually be printed on the letterhead of the survey sponsor (e.g. a government department or university) and signed by one of its officials, rather than appearing to come from the survey agency.

The advance letter(s) should be of no more than one page and should fulfil the following functions (Hales and Webster, 2008; Social Research Association, 2003):

- Explain who is conducting the research
- Explain who is funding the research
- Identify the reason for conducting the study
- Indicate the importance of the research (to the Sponsor and 'society')
- State what participation will involve (for example, whether a face-to-face or telephone interview, and the expected duration)
- Explain the nature of the information that is to be collected
- Explain how the information will be stored, reported and released
- State how the anonymity of the respondent and the confidentiality of the information they provide will be maintained
- Provide a means by which the recipient can contact the sender
- Note that the organisation's participation is voluntary but vital to the value of the research.

In a linked employer-employee survey, the advance letter for the second-stage survey should also mention that the first-stage survey has already taken place, as the fact that an employee's manager (or a manager's employee) has already participated in the survey may serve to further legitimise the request. However, it should emphasise that information will not be shared between respondents.

5) Implications of a longitudinal survey

Chapter I of the Guidelines has noted the value of collecting longitudinal information, and chapter II proposes that one way in which this might be accomplished is through a panel design in which measurements are taken on more than one occasion. This has a number of implications for the contacting phase of the survey.

The notion of informed consent (see above) implies that respondents should be made aware that they will be approached for further waves of the survey. However, this is often done at the end of the first wave of data collection. The OSA Labour Demand Panel, for example, introduces the prospect of repeat interviews only at the end of the first interview, asking then if the participant can be contacted for future waves; the WERS panel takes the same approach. As noted by Lessof (2009), this approach has the advantage of maximising responses at wave one, whilst also providing the respondent with an experience of the survey which will leave them better informed as to whether they might wish to respond again than if they were to have to make this decision in the face of considerable uncertainty prior to the first interview.

Following existing sample members as they change address is a further challenge, and one which adds to the cost of a panel design when compared with repeated cross-sections. Couper and Ofstedal (2009) provide an in-depth discussion of the issue in the context of individual or household surveys, noting that the problem is not insignificant for such surveys when at least one-in-ten individuals change addresses per year in a number of European countries²⁹. Efforts can be made to encourage individuals or businesses that change address to supply details of their new address to the fieldwork agency. This might include the provision of 'change of address' postcards at each wave, as in the British Household Panel Survey, or the establishment of a web-site where new contact details can be entered between waves. However, one cannot expect the completion of these forms to be a priority for an individual or business around the time of relocation, and so some detective work may also be necessary. This might involve referring to the updated version of the original sampling frame, or to other electronic databases which might hold the updated contact details (an option which is likely to be particularly fruitful for businesses, which may be tracked down using business directories such as Yellow Pages). In other cases, the new occupant of the address may be the best source of information.

There are further implications for the employer component of a linked employer-employee survey since, unlike individuals, workplaces can change their form between waves. Changes in workplace structure may take a variety of forms: exit (where one workplace reduces to none); amalgamations (where many workplaces reduce to one); splits (where one workplace becomes many); or more complicated restructures

²⁹ One can necessarily expect mobility rates to be much lower among businesses.

involving a mixture of amalgamations and splits (Struijs and Willeboordse, 1995). It can be expected that changes are more commonplace at enterprise level than at establishment level. Indeed, this was one of the reasons why the Canadian Workplace and Employee Survey chose to sample at establishment level (Krebs et al, 1999). In either case, a clear set of rules is required to determine how changes in the structure of workplaces would be dealt with for the purposes of survey administration. The WERS Panel Surveys have developed such a set of rules; the underlying principle is to attempt to follow some part of every establishment unless it has ceased to employ any staff (see box 8). The IAB panel takes a more pragmatic approach, choosing not to follow establishments that have undergone dramatic changes in structure. However, in a survey of organisational change, this approach risks missing some of the more interesting cases, so the more comprehensive approach – as seen in WERS – is to be preferred.

Box 8: Dealing with changes in workplace structure in the WERS Panel Survey

Establishment changes name, ownership, address, employment or activity: re-interview the original workplace as long as there was no point at which it ceased to employ workers

Establishment splits into multiple parts (without change of ownership): if any part remains at the original address, interview there; if all parts are at different addresses, follow part with largest workforce

Establishment splits into multiple parts (with change of ownership): interview that part (if any) which remains under the ownership of the original owner

Establishment amalgamates with another: interview the amalgamated workplace, whether it resides at the address of the original workplace or at the address of the workplace with which the original has amalgamated

Source: Chaplin et al (2005, p. 10)

GUIDELINES:

- Make use of advance letters
- Train interviewers in strategies for handling gatekeepers
- Set targets for the percentage of non-contacts and seek out best practice in each country to minimise non-contacts
- In a longitudinal survey, adopt clear and comprehensive rules for dealing with workplaces that change structure

III.3 Response

This section covers the issue of obtaining a response, conditional upon a successful contact having been made. First, basic preconditions will be presented, with a particular focus on the role of interviewers in establishing and maintaining a good quality interaction with respondents; the use of incentives will then be examined. To conclude the section, standardised definitions of response rates are presented and proposals are made regarding realistic response rates, given existing experiences.

1) Basic preconditions for getting a respectable response rate: the importance of interviewers

The basic pre-conditions for obtaining a respectable response rate once contact has been made with the potential respondent include the following (Hales and Webster, 2008):

- Skilled and motivated interviewers
- Flexibility to accommodate the respondent's schedule
- Persistence and good-quality follow-up procedures
- Effective communication of the public or social benefit of the research
- High quality materials
- That the request for data is both reasonable and justifiable.

According to Smith (2007, p. 46), data producers from the International Social Survey Program (ISSP) consider that, in interviewer-administered surveys, interviewer selection, training and supervision are the 'most effective strategies or tactics for maximising the response rate'. This includes interviewers following their instructions correctly, fostering a positive interaction with (and ensuring good treatment of) respondents, and having good morale and motivation. As indicated in the field procedures of the European Social Survey (ESS, 2006), there is indeed a considerable body of evidence which shows that different interviewers achieve substantially different response rates. Experience is another important factor. In the REPOSE survey, rates of refusal from employers to permit the employee representative interview to take place vary according to the interviewer; experience, as well as competency and motivation, are the main causes of observed differences.

Personal briefing of all interviewers working on the survey – with accompanying written instructions – is absolutely essential. It should not focus purely on the content of the questionnaire and the conduct of the interview, but should also deal with the respondent selection procedures (if applicable) and the contacting procedure. The training program should also seek to motivate interviewers by explaining the public or social benefit of the research – information which they can subsequently convey to potential respondents.

Other key factors in respect of interviewer motivation are both their workload and their rate of pay. Response rates and data quality may actually be affected by the amount of work allocated to each interviewer. On the one hand, it should not be too high: an interviewer's workload which is large relative to the length of the fieldwork period could place limits on the possible number of interviews; and from a methodological point of view, a high number of interviewers and an average low workload per interviewer would reduce the possibility of interviewer effects on survey estimates. On the other hand, there is a clear learning process, which leads, after a few assignments carried out by a given interviewer, to higher response rates and better data collection³⁰. A balance has so to be found, therefore, in terms of workload, in collaboration with field agencies.

Payment should be set in relation to the length and complexity of the interview, the expected difficulties of obtaining cooperation, and the amount of record keeping demanded of the interviewer. Of course, an attractive pay rate relative to the pay on

other surveys is always advantageous. And bonuses for interviews achieved above a certain response rate target may have a positive effect. However, any bonus system must be perceived as being fair. Pay arrangements should be determined in conjunction with local field agencies and specified in contracts with those agencies.

Close monitoring of interviewers' progress is necessary to allow for the early identification of difficulties. Weekly progress reports should be expected from the fieldwork agency: they should contain as essential information an overall breakdown of the issued sample and an appraisal of the response rate. A centralised management tool such as the one developed in the SHARE project (Börsch-Supan, Jürges, 2005) can be useful.

Smith (2007) also points to the importance in reducing non-response of elements which do not involve interviewers. In addition to advance letters, call backs (see previous section) and incentives (see later), having a survey with interesting content and a shorter questionnaire are mentioned by several ISPP producers as 'most effective strategies and tactics for maximising response rate'. These elements are moreover not independent: experienced interviewers would help to make the survey interesting; and only motivated interviewers would be flexible enough to accommodate the respondent's schedule and to implement good-quality follow up procedures.

Finally, high quality materials are cited as an important factor in the list at the beginning of this section. We do not cover questionnaire design in any detail in this chapter (as we noted in the introduction of this chapter), since this is the primary concern of chapters III and IV. It suffices to note that there are many authoritative sources of information on the principles of questionnaire design, particularly in a cross-national context: see, for example, Harkness et al (2003b) and the many references contained therein.

2) The use of additional incentives for respondents

Incentives are not considered, by any means, as essential to the achievement of good response rates (Smith, 2007). However, there are numerous surveys which show that even modest 'rewards' can help to improve a response rate in household surveys. Simmons and Wilmot (2004) find that according to the literature 'the use of incentives, however small in monetary terms, is effective in increasing response rates in postal, telephone and face-to-face surveys' (p.1). Moreover, these authors indicate that unconditional pre-paid monetary incentives are more effective, that they might improve data quality in terms of completeness and accuracy, and that they could be particularly important in maintaining contact with respondents in panel surveys (see Laurie and Lynn, 2009, on this last point). At the same time, incentives might also have perverse effects: a monetary reward may be more likely to encourage the participation of people with low incomes rather than those with high incomes. The use of monetary incentives may also erode the feeling of civic duty, and have even been refused by potential survey respondents in some countries. One must therefore be sensitive to the local context.

³⁰ In the REPOSE Survey, the duration of interviews has been stabilised after an average of ten interviews carried out by a same interviewers. This threshold can be seen as the end of the learning process.

In employer surveys, there is less evidence than in the employee case: as noted by Biemer et al. (2007) after a large scale experiment, 'results provide no evidence that the incentive has any effect on establishment cooperation rates' (p. 509). Good quality advance letters or booklets, experienced and motivated interviewers, and prompt mailing out of the survey first findings are therefore more important than gifts or monetary incentives when seeking to improve cooperation among workplaces and companies.

3) Calculation of response rates

Usually, the response rate is defined as the number of complete interviews with reporting units divided by the number of eligible reporting units in the sample (e.g. Groves, 2004). In a cross-national survey, a consistent approach is clearly important if one is to be able to compare survey quality from one country to the next and so each country must adopt a coordinated approach to the coding of fieldwork outcomes. This first involves the use of a code frame for recording contact attempts which specifically takes the international nature of the survey into account: Blom (2008) proposes such a code frame which provides consistency at an aggregated level but which also explicitly allows for country-specific outcomes (e.g. due to differences in sampling frames). One also requires consistency in the way in which final outcomes are derived from the records of contact attempts (i.e. whether the final outcome code is derived simply from the last attempted contact or whether priority is given to the attempt that yielded a response most akin to a refusal).

In addition, it is also necessary to have a consistent approach to the calculation of the response rate from the final outcome codes. We propose that one should follow the guidelines put forward by the American Association for Public Opinion Research (AAPOR) (2008, pp. 34-36)³¹. If **I** is the number of complete interviews, **P** the number of partial interviews, **R** the number of refusal and break-off, **NC** the number of non-contacts, **O** the number of other cases, **U** the number of unknown eligibility status units (household or employer) and **e** the estimated proportion of cases of unknown eligibility that are eligible, then the response rate (**RR3** in the AAPOR schema) is defined as:

$$RR3 = I / ((I + P) + (R + NC + O) + eU) \quad (1)$$

In estimating **e**, one must be guided by the best available scientific information on what share of eligible cases make up among the unknown cases and one must not select a proportion in order to boost the response rate. The basis for the estimate must be explicitly stated and detailed. When no estimation of **e** can be made, one might take **e = 0**, i.e. no cases of unknown eligibility is eligible. The response rate is then a maximum (**RR5** according to the AAPOR definition). Alternatively, one might take **e = 1**, i.e. all cases of unknown eligibility are eligible. The response rate is then a minimum (**RR1** according to the AAPOR definition).

For unequal probability design surveys, one may also compute a weighted response rate, as follows (ibid, pp. 39-41):

$$RR3w = Iw / ((Iw + Pw) + (Rw + NCw + Ow) + eUw) \quad (2)$$

³¹ Such a choice has also been made by EuroFound for the EWCS.

where the numerator is the sum of the w (inverse of inclusion weights) for all the persons that completed the interview and the denominator contains the corresponding weighted counts. This response rate estimates the percentage of persons in the frame that responded.

Finally, given that the survey would be sampled through a multistage and a longitudinal design, one must give response rates at each level (employer and employee) and also attrition rates over time.

4) Reasonable expectations regarding response rates

As noted in chapter II, for both employer and employee, the highest response rate is of course targeted, but response rates depend on the surveyed unit (employer or employee), on the data collection method used and on the institutional setting at the national level. Table 4 indicates the inter-country range in response rates to a selection of pan-European surveys of households and employers.

Table 4: Range of response rates to a selection of pan-European surveys

	Mode	Fieldwork agency	Minimum response rate		Maximum response rate	
			%	Country	%	Country
LFS 2005 (compulsory)	Face-to-face / telephone	NSO	79	BE	97	CY
LFS 2005 (voluntary)	Face-to-face / telephone	NSO	63	DK	96	RO
EWCS 2005	Face-to-face	Private agencies	28	NL	69	CZ
EES 2006	Face-to-face	Private agencies	46	FR	73	SK
CIS 1998/2000 (compulsory)	Self-completion	NSO	48	SE	96	NO
CIS 1998/2000 (voluntary)	Self-completion	NSO	21	DE	74	PT
ESWT 2004/2005	Telephone	Private agencies	8	IE	62	PL

Note : Response rates have been taken from published sources (Eurostat, 2007a; Parent-Thrion et al, 2007; European Social Survey, 2007; Lucking, 2004; Bielski and Riedmann, 2005) and may not always be exactly comparable. NSO = national statistical office.

Further investigation of the data underlying this table indicates that response rates are globally higher in the EU-new member states, Portugal and some (but not all) Scandina-

vian countries; on the contrary, and in keeping with the findings of de Heer (1999), they seem to be lower in the United-Kingdom, Belgium and the Netherlands. These variations may partly represent differences in the climate for surveys in different countries, informed by national opinions about civic duty, research intrusion and privacy (Couper and de Leeuw, 2003, p. 170). However, they also partly reflect methodological differences. Responses to surveys are more frequent (+) or less frequent (-) in the case of: telephone (-) versus face to face (+); voluntary (-) versus compulsory surveys (+); and those carried out by private agencies (-) versus National Statistical Offices (+). The final point is particularly noteworthy: officially-supported surveys seem more legitimate and worthy and their advance letters appear more authoritative; their response rates therefore tend to be much higher than for academic surveys. In consequence, any survey should as far as possible try to involve the National Statistical Offices or the Government Departments, even if private agencies are used for the fieldwork.

Given these various elements, it is difficult to define a clear objective in terms of response rates. Eurostat judge that a medium-range response rate for a demanding voluntary survey would be in the range 40%-60%, or 60-80% for a short voluntary survey (Eurostat, no date) (see box 9). The European Social Survey, for its part, sets a target of 70% response in each country (Lynn et al, 2007). The MEADOW Guidelines thus recommend a target rate of 60% for the survey in each participating country. Item-level (i.e. question-level) non-response should also be a focus. The Guidelines recommend a target rate of 85% completion for each question in the survey. This implies no more than 15% non-response per item among survey participants, which is the upper bound of the 'medium' range set for item non-response by Eurostat (ibid).

Box 9: Eurostat guidelines on response rates for a demanding voluntary survey

	Unit level	Item level
Low non-response rate:	Less than 40%	Less than 5%
Medium non-response rate:	40-59%	5-14%
High non-response rate:	60% or more	15% or more

source: Eurostat (no date)

If the threshold of a 60% survey response rate is not met in a particular country, publication of their results should be conditional upon an assessment of the data by an expert group. This group would have access to data from a non-response follow-up survey in which one attempts to gauge very briefly the prevalence of organisational change among a sample of non-respondents to the original survey. Such a non-response follow-up should be planned in each participating country.

These are Guidelines for a single implementation of the survey. However, a longitudinal survey brings further considerations. Specifically, attrition rates can be high and apply cumulatively over time, although these may be limited by expending effort to track mobile respondents, using incentives, maximising interviewer continuity across waves

and limiting the length of interviews (see Watson and Wooden, 2009). The complexities (and scarcity) of longitudinal surveys mean that it is difficult to provide over-arching guidelines as to what constitutes a reasonable response rate. However, it can be noted that a longitudinal survey which obtains even a 60% response rate at each wave will encounter a substantial diminution of the original sample after just two or three waves purely through non-response.

Even if a high response rate is achieved, observed non-response biases should be addressed through non-response weighting (see the later section on 'Weighting'). It can be noted that a linked survey brings additional possibilities in this regard: in the employee/employer variant employer non-response analysis can be performed using information given by their employees. In the employer/employee variant employee non-response bias can be assessed using responses given by their employers. Equally, in a longitudinal survey, non-response analysis can be performed using information given at a previous wave.

GUIDELINES:

- Ensure that the basic pre-conditions for good response rates are met. Pay explicit attention to interviewers.
- Encourage participation by national statistical offices where possible
- Follow the proposed standards for recording fieldwork outcomes and computing response rates
- Set a target response rate of at least 60% and seek to quantify (and remove) non-response biases

III.4 Data collection methods

The main goals of a survey are to collect useful information that is not available from other sources, to provide unbiased results for the population of interest (either through a census or a probability sample) and to obtain comparable results, where the same type of information is collected from every respondent. These goals are affected not only by response rates and other factors discussed above, but also by how the survey is administered, or the collection mode. The main goal is to choose a data collection strategy that best suits the specific requirements of the research question, survey topic, and population of interest, while maximizing data quality and minimizing costs (De Leeuw, 2005).

The methods for collecting survey data have increased over the last decades. Mail surveys and face-to-face interview surveys have been supplemented with fax, telephone, email and web-based surveys. Computerisation also permits immediate data capture for the latter three survey types, reducing the cost and time of conducting a survey. Nevertheless, mail surveys remain common (Dillman, 2000). The general trend is towards less interviewer-driven and more self-administered questionnaires rather than interviews, due to both technology and budget constraints. Indeed, self-administered questionnaires are the most frequent mode employed in the various employer surveys included in the grid reports, followed by telephone and face-to-face interviews³².

The majority of employee surveys cited in the grid used self-administered questionnaires, with face-to-face interviews second in popularity.

1) Self-administered surveys

Self-administered questionnaires require the respondent to read the question first in order to comprehend what is being asked. Questions need to be simple, and easy to understand, as there is no interviewer available to assist the respondent. All possible answers should be included. Complex questions or a lot of routing instructions must be avoided to prevent confusion and fatigue (Dillman, 2000, provides guidance). There are three main types of self-administered questionnaires :

- Printed questionnaires mailed or faxed to respondents.
- Electronic questionnaires sent to respondents either in an email or attached to an email. The completed questionnaire can be returned by mail or email.
- Web based surveys where the respondent completes the questionnaire on-line.

Mailed surveys are a cheap method for surveying large samples, even more if the sample is geographically spread. Fax questionnaires have a maximum length of approximately two pages, while a printed questionnaire can be as long as six or eight pages (up to 15 minutes completion time), although response rates decline with length. Given a good follow-up protocol and an interesting and relevant questionnaire, the response rates for a mailed survey are moderate (40% to 60%) and good for a short fax survey (70% to 80%).

In email surveys, the questionnaire is sent by email, either embedded in the email or included as an attachment. It is returned by email. Embedded questionnaires are simpler for the respondent because there is no need to open, save, and reattach the completed questionnaire. Moreover, it avoids the risk that respondents will not open the attachment because of concerns that it contains a virus. Not all e-mail software is able to interpret complex texts, images, etc. Consequently, email questionnaires must be kept simple and short, which is in itself a disadvantage.

Web based surveys are growing in popularity as they are cheap, fast, suitable for international surveys, and the data are immediately entered into a computer readable format. Skip routines are directly built in, saving the respondent time. It can be sent as a link in an email or as a pop-up window on a website. However, both alternatives are problematic, as people normally delete emails that they think are not relevant. Moreover, modern browsers may block pop-up windows automatically. Both web based and email surveys also have sampling and data response problems : access to email and to internet is restricted among the general population (see www.internetworldstats.com), though close to 100% for firms. The most serious problem is very low response rates for voluntary web and email surveys (below 10%).

³² Meadow background document N°2, available at <http://www.meadow-project.eu/index.php?!Article-du-site/Background-documents.html>

2) Interviews

Interviewer-administered surveys require respondents to listen to the questions being asked. There are two main interview methods: face-to-face and telephone. Face to face interviews allow the use of visual cues, including response aids such as show cards, but telephone interviews are restricted to audio-only communication.

Almost all personal interviews today use computer assistance (CAI). The interviewer reads structured questions to the respondent from a computer screen and immediately keys the answers into the computer. CAI systems include skip routines that automatically guide the interviewer to relevant questions, depending on previous responses. They also permit range checks and consistency checks to be conducted during the interview process. Both features reduce the number of data errors.

Telephone interviewing is usually cheaper than face to face interviews but the questions and the number of response categories must be shorter than in face-to-face interviews because the respondents will be unable to remember complex questions or a long list of responses that are read out to them (Czaja and Blair, 1996). The overall interview must also be shorter because a telephone conversation is more taxing than a face-to-face interaction. Telephone surveys should therefore be no longer than 30 minutes in duration, whilst face-to-face interviews may extend beyond one hour. Moreover, people are less inclined to answer sensitive questions when they have not met the interviewer.

3) Advantages and disadvantages of different modes

Table 5 below provides a summary of the advantages or features of different modes when compared with each other in a number of areas. The table shows that no single method is unequivocally superior, with each having its own advantages and disadvantages. The preference in the MEADOW Guidelines for a linked survey of employers and employees creates particular demands, however. It has already been noted that few countries provide linked registers of employers and employees. The process of drawing the second-stage sample will therefore typically require the cooperation of sample members from the first-stage. In the employer-first approach, the need to engage the employer in the process of sampling employees (see earlier section on sampling methods) implies that a face-to-face method would be the preferred choice for the employer component. The employee survey might then use a self-administered questionnaire, as is the practice in the British WERS and French REPOSE surveys, although telephone or face-to-face interviews are also possible if the necessary contact details can be obtained³³. In the employee-first approach, one might see face-to-face or telephone interviewing as feasible options for both the employee and employer components. Face-to-face interviewing is generally to be favoured though (cost aside), as it generally leads to the highest response rates. High response rates for the first-stage survey are particularly important, as the response rate for the second stage is necessarily cumulative and may otherwise be unavoidably low.

Table 5: Summary of the advantages of self-administered questionnaires, telephone interviews and face-to-face interviews

	Self-administered questionnaires	Telephone interviews	Face-to-face interviews
Sampling	Easier to cover geographically dispersed groups		
Question design (1)	Can provide detailed explanations (although these may not be read)		Can use visual aids, such as lists of defined response options
Question design (2)	Can ask for quantitative information which requires recourse to records		
Data quality (1)	Least amount of satisfying*		Least amount of satisfying**
Data quality (2)		Interviewer can exercise quality control	
Questionnaire length	Maximum 15 minutes completion time	Maximum 30 minutes	1 hour or more
Response (1)			Highest response rates
Response (2)		Less response bias, since easier to accommodate poor literacy	
Cost	Cheapest	Cheaper than face-to-face	

Notes to table :

For further details, see for example: Fowler (2002, pp. 58-75); Groves (2004, pp. 501-552) and Groves et al (2004, pp. 138-168).

* 'Satisfying' refers to the process whereby a respondent may provide answers that they believe are more socially acceptable or socially desirable than the true answers. Further details: DeMaio (1984); Tourangeau et al. (2000); Sudman and Bradburn (1974); Dillman (2000); Tourangeau and Smith (1998).

** 'Satisficing' refers to the process whereby a respondent may give an arbitrary response, rather than the true answer, merely to satisfy the request to complete the survey. The extent of satisficing is related to task difficulty, respondent ability and respondent motivation. Further details: Krosnick (1991); Holbrook et al. (2003); Jordan, Marcus and Reeder (1980); Krosnick et al. (1996); Jäckle, Roberts and Lynn (2006).

The timing of the two stages of data collection is also important. Data quality considerations require that the two stages should be conducted relatively close together in time, so as to ensure that the data obtained in the two interviews are comparable. Close proximity of the two stages of data collection will also minimise sample attrition arising from employee job mobility or (to a lesser extent) employer relocation.

³³ As Dillman (2000) notes, using mixed modes in the different stages of data collection will not introduce comparability problems if all respondents reply to the same questions using the same mode.

The MEADOW Guidelines recommend that the time delay between the employer and employee observations is limited to no more than three months.

4) Mode variations in cross-national surveys

When doing research in different countries or cultures, using different data collection modes can create problems with comparability. Multi-nation surveys depend for reliability purposes on a “principle of equivalence” (Jowell, 1998), which applies to all aspects of the survey process. The use of face-to-face methods in one country and a mailed survey in another can reduce equivalence. To avoid these problems, cross-national surveys tend to prefer all participating countries to employ the same mode of data collection. However, this can be impractical due to national variations in survey practice, such as experience of using different modes, the available infrastructure for conducting surveys in different modes, the level of coverage offered by different modes, and the willingness of respondents to reply to specific collection modes. For instance, Lynn (2001) notes that telephone surveys are only possible in countries that have a complete listing of telephone numbers (e.g. Sweden) or that can efficiently generate samples through Random Digit Dialling (e.g. UK and Germany). At the same time, costs can prohibit the use of face to face interviewing in large countries with low density populations (e.g. Sweden, Finland and Norway). Consequently, using the same collection mode in all countries may not always be the best way of ensuring equivalence.

These problems can only be overcome by developing a thorough understanding, across countries, of the causes of measurement error. Researchers must assess the potential contribution of mixed modes to reducing or increasing error and equivalence and to develop strategies for dealing with the negative implications of more complex survey designs (Roberts, 2007). One strategy is evaluate the effect of the collection mode through using different modes in sub-samples. When no experiments are possible, matching is an alternative: for example, in concurrent mixed-mode surveys, subjects are matched in both modes on important variables (preferably measured independently of the mode, e.g., register, sampling frame, and demographics) to see if the matched groups differ in their question responses.

A further strategy that can mitigate mode effects is to adopt a “uni-mode” approach to questionnaire construction, where questions are designed to be suitable for administration in all the modes (Dillman, 2000). Such questions provide equivalent stimulus across modes. As an example, a questionnaire that is designed for both mailed and telephone interview surveys would need to avoid matrix question formats and build definitions into the question to ensure that respondents to the mailed version are forced to read them. The uni-mode approach is the best option when developing a new survey from the beginning, although constructing questions that are suitable for all modes may result in question formats or methods of administration that are less optimal for some modes than for others (Weisberg, 2005).

GUIDELINES:

- Use face-to-face interviewing if possible, and particularly at the first-stage if a national linked employer-employee sampling frame is not available
- Use self-administered questionnaires where cost is a particular constraint, or where respondents may need to refer to records or report sensitive information
- Limit the time delay between the employer and employee observations to no more than three months
- Develop a uni-mode questionnaire, to provide flexibility over the mode of data collection

III.5 Developing cross-national instruments

As noted in earlier sections, this chapter is not concerned with the details of questionnaire design. However, this section does discuss a number of broad issues that are relevant to the Guidelines, namely: the general principles of developing cross-national instruments, translation procedures and questionnaire testing procedures.

1) General principles

Harkness (2003b, p. 21) notes that there are two principal approaches to the development of a cross-national instrument: adoption or adaptation. The majority of cross-national surveys use the ASQ (Ask the Same Question) model, in which the questions asked in one country are straightforwardly adopted in other countries in the study after translation. This model assumes that questions in the source questionnaire are suitable for all cultures. Translations are close and literal as they try to keep the same measurement properties of source items. This approach may mean that respondents arrive at unintended interpretations of questions or unintended perceptions, either because the meaning is not the same, the concept is not identical or the item is socially difficult to answer. In these circumstances, literal translation may not be an appropriate method for asking the same question. Adaptation is a deliberate modification of a question or questionnaire to meet new requirements. It may be undertaken in source questions, but also in translated questions. Adaptation can be applied to both the initial design of a questionnaire and to its translation. The main principles are that: the measurement properties should remain; the intended latent construct should remain; the burden or difficulty should not change; and the relationship to other questionnaire elements should not change (Harkness, 2008).

The adaptation process itself may involve the following (Harkness, 2003b, pp. 27-28):

- Terminological or factual adaptations (e.g. to account for differences in the names of equivalent institutions)
- Language-driven adaptations (e.g. to account for differences in physical and grammatical genders)
- Convention-driven adaptations (e.g. to account for different conventions in the order of processing text and scales : left-to-right or right-to-left)
- Culture-driven adaptations (e.g. comparative studies show that different cultures interpret scalar variables such as ‘low’, ‘medium’ and ‘high’ importance differently (Mohler *et al*, 1998).

One potential problem with the adaptation approach is, of course, that small changes may not necessarily be insignificant (Harkness, 2003b, p. 27). The equivalence of cross-national instruments must therefore be tested and demonstrated.

2) Translation procedures

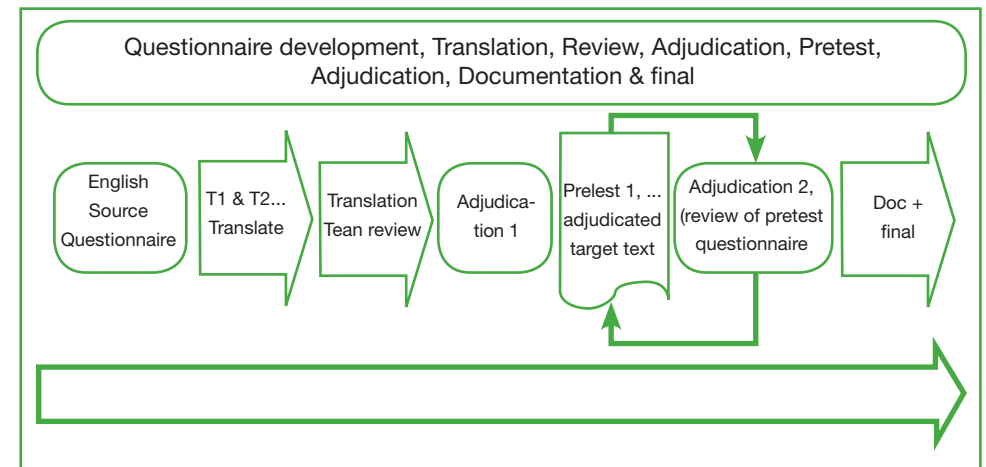
The source questionnaire should be written by native speakers of the reference language, but this process should ideally include native speakers of the other languages into which the questionnaire will be translated, as this can help to identify possible translation problems early on. There are then different possible approaches to the actual translation process.

Solo translation (the use of a single translator) is cheaper, faster and simpler than a team approach, but has several drawbacks, including regional variances, idiosyncratic interpretations, and blind spots. A team approach is therefore preferable in terms of quality. The CSDI (2006) guidelines recommend using more than one translator whenever possible. It avoids idiosyncratic bias and reduces error, removes pressure off just one individual, allows for variance and provides richer input of suggestions for the review process. The use of only one translator, without a support team that can provide knowledge from different fields, will be unlikely to provide an adequate translation for a multiple topic survey that requires a range of specialised vocabularies (CSDI, 2006). The preferred team approach is 'parallel translation' in which several translators make independent translations of the same questionnaire. A speedier alternative to parallel translation is 'split translation', in which one translator translates only a segment of the questionnaire. However, it requires at least one person to review whole of the final translated questionnaire.

Following the translation process, all versions should be reviewed with those involved. Back translation may also be used as an assessment tool (Brislin, 1970; Werner and Campbell, 1970). An adjudicator is then responsible for signing off on the translation. The translated questionnaires should then be tested, including everything translated for the study (instructions to interviewers and support materials). There are several strategies for pre-testing, including focus groups, cognitive interviews, split pre-tests with bilinguals and monolinguals, respondents and field staff debriefing. Field staff can also help pre-editing translations before fielding. This naturally implies an iterative procedure, with possible amendments being necessary, which are then re-tested. Finally, both translation and review decisions must be documented. These include changes made at each stage of the questionnaire revision, unresolved difficulties, translation compromises, and adaptations.

The whole process may be summarised in the following figure:

Figure 1: The TRAPD model



Source : Mohler et al. (2007)

GUIDELINES:

- Follow the TRAPD model
- Adopt parallel translation

3) Survey testing procedures

Survey testing procedures allow the researcher to identify potential problems in survey instruments and fieldwork procedures before the survey enters the field. Although this entails extra time, effort and costs at the beginning of a survey project, the testing procedures may lead to an improvement in the methods of data collection before the actual fieldwork takes place. As a result, time, effort and money can potentially be saved in the long run, and the inadvertent waste of resources due to poor design can be avoided.

The nature and scale of the survey testing that is appropriate will depend upon the innovativeness of the study design. The importance of thorough and extensive testing necessarily rises with the complexity of the study, but some testing of the survey instruments and fieldwork procedures is recommended in all cases in which some element of the design is unproven. Furthermore, survey involving special populations, such as establishments, or surveys that require questionnaires in multiple languages, may create special design problems that require testing (see Smith 2003; Willimack et al., 2004). The survey testing procedures themselves are of two types: small-scale trials of particular research components (typically called 'pre-tests'); and larger-scale trials of the combined survey method (typically called 'pilot tests'). We discuss each in turn below.

Pre-tests are small-scale evaluations of questionnaires or fieldwork procedures that are carried out to assess functionality, appropriateness, and feasibility. Pre-tests usually take place in the earlier stages of the design phase and are typically conducted on convenience or purposive samples. Problems can then be identified and resolved before the instrument is subject to a larger-scale test and before it enters the field. The form of the evaluation can vary. In the case of questionnaire testing, researchers may distribute the questionnaire for expert review or conduct cognitive interviews in which they listen to respondents as they complete the questionnaire in order to ascertain whether there are difficulties with comprehension or completion of the questions. In surveys of employers, it may be necessary to assess the ease with which the respondent may access record-based information (e.g. on the structure of the workforce or the economic performance of the organisation).

Pilot-tests are larger-scale evaluations which test the combined survey methods under conditions that are very close to those which will be encountered in the final implementation of the survey. Pilot testing may consist of one or more evaluations of the survey procedures as they are being developed and refined, leading to a full ‘dress rehearsal’ of the fully-developed methodology. Debriefings are typically conducted with interviewers – and sometimes also with respondents – in order to help to identify those elements of the test that were successful or unsuccessful and to identify possible revisions. The samples used are typically large enough to provide quantitative data (e.g. on the likely duration of survey interviews and likely levels of unit and item non-response) and to assess the performance of the survey methodology across sub-groups of the population. If the sample is sufficiently large, experiments may be conducted to provide formal, controlled tests of alternative procedures or questions.

GUIDELINES:

- Conduct pre-tests of questionnaires and fieldwork procedures in order to assess the functionality, appropriateness and feasibility of the survey methodology in each participating country
- Conduct at least one pilot test of the combined survey methods in each participating country prior to the final implementation of the survey

III.6 Data Collection Issues in Longitudinal Surveys

Longitudinal or panel surveys raise methodological issues that do not occur in cross sectional surveys. The most important are seam effects and the use of dependent interviewing.

1) Seam effects

Retrospectively collected history data are affected by recall error. Respondents’ memory is less accurate with the time since the event took place, which reduces accuracy. The impact of recall error can be attenuated by collecting information prospectively in panel or cohort studies, as they reduce the length of the recall period. Nevertheless, combining data from repeated panel observations lead to “seam effects”, which are defined as a concentration of transitions at the seam, between two waves of a panel

survey. Rips et al (2000) suggest that the seam effect is the result of economising on the number of interviews: by interviewing at every certain date (for example, once a year) and asking questions about the preceding interval, surveys produce response errors that would probably not have occurred if the interviews had been conducted on a more regular basis. Lemaitre (1992) stated that all longitudinal surveys appear to be affected by the seam effect, regardless of differences in length of recall periods or other design features.

The increase in transitions at the seam is a consequence of combining data from repeated panel interviews in the presence of measurement and data processing errors, leading to under-reporting of within-wave changes and spurious transitions at the seam (Moore and Kasprzyk, 1984). While recall errors takes place when respondents forget events, reinterpret them or remember them correctly but not the dates at which changes occurred, coding errors are particularly problematic for classifications of occupation or industry, and in open-questions. When coding and recall errors are present, changes are typically observed at the point where two data sources meet.

With the introduction of CAI (computer assisted interviewing), panel studies have been able to introduce dependent interviewing techniques, which can reduce the occurrence of false changes at the seam and of constant wave responses caused by unreported events.

2) Dependent Interviewing

Dependent interviewing (DI) is only relevant to surveys that are repeated at consecutive time periods for the same respondent. Information obtained from previous waves of data collection is used to customise the wording or routing of questions for a specific respondent (proactive DI), or otherwise to include automatic checks during the interview (reactive DI) (Jäckle, 2009). DI differs from independent interviewing, where respondents are asked the same questions at different points in time, without reference to previous answers.

One advantage of DI is that it can reduce respondent burden. Respondents to repeated panel surveys complain about having to answer the same questions repeatedly although their circumstances have not changed (Phillips et al. 2002). This is especially problematic for surveys with short intervals between interviews and for typically stable items. If there is a true stability, dependent interviewing can be used to avoid asking redundant questions (e.g. about the age of the respondent or the establishment, or the respondent’s gender). Moreover, adapting questions to the respondent’s situation improves the flow of the interview and reminds respondents of previous answers, simplifying the response task, by replacing recall for recognition (Hoogendoorn, 2004) or requiring yes/no instead of open-ended answers (Jäckle, 2005). By personalising the questionnaire, DI can reduce respondent burden, increase efficiency of data collection and data quality (Lynn et al., 2004).

DI can also improve item non-response. This is a problem that affects all types of surveys, but in panel surveys, respondents can be reminded of previous reports to refresh their memories and questions that remained unanswered can be fed forward and

repeated in the following interview. DI may also reduce measurement error. For instance, edit checks based on information from previous interviews can be built in to check for consistency with previous reports. In this way, DI can reduce the observed concentration of transitions at the seam between waves (seam effects – see above). Edit checks are used to improve data quality, but because they imply additional and potentially difficult questions, the data improvements may come at the cost of respondent burden and efficiency of data collection.

GUIDELINE:

In a longitudinal survey, take advantage of dependent interviewing where possible, but be sensitive to respondent burden

IV. Data preparation, data analysis and dissemination

IV.1 Introduction

This section of the chapter focuses on survey operations that generally occur after data are collected. It is first necessary to transform the recorded answers of respondents so that they can be used for further work using statistical software. Here, the first step is the process of turning any verbatim answers into numeric answers (coding). Then, numeric data has to be entered into files (data entry). After data entry the – now electronically – recorded answers must be examined to detect possible errors and inconsistencies (editing). It is also possible that there is some data missing due to non-response on specific questions: missing data can be “repaired” by imputation. These various issues are discussed below. Beside these aspects of data preparation, another activity that might occur after data collection is the adjustment of computations of survey statistics to counteract harmful effects of noncoverage, nonresponse, or unequal probabilities of selection into the sample (weighting). With respect to data analysis the computation of estimates of the precision of survey statistics (standard errors) is important, too. Such issues are discussed in the next sub-sections dedicated to weighting. Finally, data dissemination and issues of confidentiality in data sharing and linking become important once the survey has been completed. These issues are discussed in the next sub-section dedicated to dissemination.

IV.2 Coding, data editing and imputation

1) Coding

Coding becomes necessary when a questionnaire includes ‘open questions’ that invite verbatim responses; the coding step then involves assigning a distinct number to each of the possible answers of question. The numeric codes should have the following attributes (Groves et al. 2004, p. 306):

- A unique number, used later for statistical computing
- A text label, designed to describe all the answers assigned to the category
- Total exhaustive treatment of answers (all responses should be able to be assigned to a category)

- Mutual exclusivity (no single response should be assignable to more than one category)
- A number of categories that fit the purpose of the analyst.

It is usual to find that at least a few verbatim responses cannot be easily assigned to a code. Hence, it is important to test and refine a coding structure in advance, e.g. on one part of the sample. Responses that do not fit well with existing categories may lead to a reconsideration of the existing code structure. It is also important to note that the coding structures must be designed to handle all responses, even those judged as uninformative for the present. As it may become important to investigate the reason for non-response or to replace missing data (imputation) it is also critical to have a consistent code for those who fail to give an answer that meets a question’s objectives. The same applies to those respondents that are asked to skip one or several questions because they do not apply to them based on their previous answers.

In order to allow for (international) comparability it is also possible to use classifications that are standardised by international bodies and periodically updated. Some of the classifications which are relevant for the MEADOW Guidelines are discussed in the appendix to this chapter. The standardisation is valued because it permits a comparison across surveys of attributes of commonly defined populations. However, it is important that coding to detailed classifications, such as those relating to occupation or industry, are undertaken by experienced personnel and that quality assessments are made, since statistical errors yielding noticeable effects on survey statistics can be produced by the act of coding itself (see Collins 1975, for example).

2) Data editing

Editing concerns the examination and alteration of collected data, prior to statistical analysis. The goal is to verify that the data which have been collected have the properties that were intended by those who designed the questionnaire. It is accomplished through different kinds of checks. Most common are (Groves et al., 2004):

- Range edits
- Ratio edits
- Comparisons to historical data
- Balance edits
- Checks of the highest and lowest values in the data or other detection of implausible outliers
- Consistency edits.

Although the use of computer-assisted interviewing (CAI) permits most of these edits to be done during the process of data collection, the interaction between interviewer and respondent required to clarify errors that are revealed by data editing is sometimes complex (Bethlehem 1998). Further, the length of the interview is increased when possible edit failures must be resolved. In such situations, the risk of a premature termination of the interview naturally rises. Moreover, not all edits can be built into CAI applications, especially when survey responses are compared to (large) external databases. Finally, it is possible that the respondent insists on a set of answers which violate the edit checks. For that reason, it is important to distinguish between “hard checks” (rules that must be followed) and “soft checks” (rules which may be suppressed and overridden by an

interviewer). In practical terms, one should seek to limit the number of hard checks and to use them only when a combination of responses is logically impossible (e.g. the respondent reports that the number of female employees is greater than the size of the total workforce). The number of soft checks should also not be so great as to unduly lengthen the interview or interrupt the flow of the questionnaire.

Overall, the amount of editing that is used on a survey can be regarded as a function of how much factual data with logical consistency structures are collected, whether the sample was drawn using an informative sampling frame, and whether there exists longitudinal data on the case. For this reason, establishment surveys collecting economic data from companies longitudinally generally utilise a relatively large amount of editing. Social surveys, on the other hand, tend to employ a relatively limited amount of editing (see Box 10).

Box 10: Data editing in WERS and the IAB panel

In WERS and the IAB Establishment Panel the focus of editing is principally on the minority of quantity-focused questions (e.g. number of employees; breakdown by occupation) and on ensuring internal consistency within the data. This includes checking the reported information (e.g. on number of employees, industrial activity) against the information provided on the sampling frame as a means of checking that the interviewer approached the correct unit. Telephone calls may be made to the establishment in an attempt to resolve major queries that result from the post-fieldwork editing process.

3) Imputation

Item-non-response refers to the situation in which a respondent does not supply the researcher with a valid answer on the item in question (the absent data is commonly referred to as 'missing data'). It often causes difficulties in social science research - particularly in analyses which involve several variables since the methods of multiple regression, multivariate analysis of variance and so on, are not designed to work with incomplete datasets. In dealing with missing data, it is important to know whether missingness is (partly) related to the value of the item in question. In this respect, different types of missing data can be identified (see table 6). Advanced missing value imputation approaches typically focus on data that is 'missing not at random' (MNAR) or 'missing at random' (MAR).

Table 6: Types of missing data

Type	Acronym	Description	Example
Missing not at random	MNAR	The fact of the item being missing is related to its value	Establishments with high levels of sickness absence may be less inclined to answer a question on the rate of sickness absence
Missing at random	MAR	The fact of the item being missing is related to the value of another measured item	Small establishments may be less likely to keep records and thus less able to report their rate of sickness absence
Missing completely at random	MCAR	The fact of the item being missing is unrelated to its value or to the value of other measured items	Establishments which cannot report sickness absence are a random selection of all establishments

See Schafer and Graham (2002), Rubin (1976).

There are a variety of approaches to dealing with missing data. Items with an exceptionally low response rate should be carefully rechecked for data entry mistakes or other 'causes'. If the low response rate appears to have arisen because too many respondents did not understand the item, it might be better to drop the item from the working copy of the database and not to analyse it any further. If the item is retained, the most popular method for missing data handling is naturally to discard units whose information is incomplete on any of the involved variables in a multiple or multivariate analysis (so-called listwise deletion). Particularly when many variables are involved in a multiple or multivariate analysis, the remaining cases may not be representative, however, of the entire sample (let alone the population) and some account should be taken of this, e.g. through non-response weighting.

The second-most popular method of dealing with missing data is usually called *pairwise deletion*. In particular in multiple regressions, this implies that all 'pairwise' correlations are computed, in each case with all respondents having a valid entry on the two variables involved. Then, the regression analysis is performed on the correlation matrix containing the previously mentioned correlations. Although technically more information is used with pairwise deletion than with listwise deletion, pairwise deletion has two important drawbacks. First, the degrees of freedom are determined by the correlation with the fewest observations, and second, the correlation matrix is calculated using a different sample set for each correlation and the correlation matrix may therefore become inconsistent (not positive definite), sometimes leading to computational problems.

Alternatively, one might consider methods of imputation. The simplest approach is replacement by the mean. Here, the missing value is substituted with the mean of *all the other cases* (thus called ‘*unconditional* mean substitution’). This is only possible with variables which are suited to regression analyses, that is variables measured at the interval level or beyond (although categorical/nominal variables may be involved as well, provided they are transformed into the appropriate set of dummy-variables). Now all cases may be used, but mean-substitution implicitly assumes that the missingness-pattern is completely at random (MCAR) which is usually too far-fetched and assuming MAR would be more to the point. Moreover, while the mean before and after mean substitution remains the same, the standard deviation becomes artificially smaller, and so will the standard error, resulting in 95% confidence intervals that are too narrow and significance (*p*-) values that are too small.

A variant of mean-substitution is replacing a missing with the mean of a series of other items *within* the respondent. Many concepts covered in the MEADOW Guidelines will be evaluated with a series of items resulting in several scales. Provided the resulting scale is reasonably reliable (say Cronbach’s alpha is at least 0.60) then it is customary to calculate the mean scale-value on the items a respondent has properly filled in. At TNO the restriction is usually that a respondent will receive the scale-score, if he or she has at least two-thirds or three-quarters of the items valid, otherwise the respondent will receive a ‘missing’ on the scale.

Hot deck *imputation* implies that for each respondent with a missing value on a ‘target’ variable, another respondent is sought who closely resembles the first respondent on ‘all other variables’, but does have a valid entry on the target variable. Then that value is entered for the first missing value. If there is more than one ‘similar’ case, one of them is selected at random. In spite of its straightforwardness, this method is rarely used in practice as there has been little software developed to support this method, and more advanced methods have superseded it. *Conditional mean imputation* implies the group-mean is substituted for the missings, but now for subgroups separately. For instance, missings among men are replaced with the mean among the other men, and the same for the women. This procedure assumes missing at random (MAR), not necessarily completely at random (MCAR) and so is more realistic. It also retains more, though not all, of the original standard deviation of the items involved. A close relative of this is regression *imputation*. Here, the ‘target’ variable say item *j* is modelled with items 1...(*j*-1) among the cases that do have item *j*. Then for each case that is missing on item *j*, the regression equation is filled in and the fitted value is substituted.

A more profound approach was formulated by Dempster, Laird and Rubin (1977). In short, this approach poses the question : ‘Which hypothetical complete dataset has most likely (maximum likelihood, ML) resulted in this particular dataset with this pattern of missing data ?’ Here, the equations are usually solved with the expectation maximisation (EM) algorithm (Little and Rubin, 1989). Important is that the standard deviation (and so the variance and eventually also the standard error) is not artificially reduced in this approach. An EM algorithm for maximum likelihood estimation is available in several specialised programs, including SPSS, LISREL, SAS, and in Stata.

The missing data methods discussed thus far all involve ‘*simple*’ imputations, in that one missing is replaced by one imputed value. In ‘*multiple*’ imputation, proposed by Rubin (1987), each missing value is replaced by a list of simulated values. This produces a series of hypothetical datasets that each might have resulted in the current dataset with missing values. Then each of these data sets is analysed in the same fashion by a complete-data method. The results of these analyses are then finally combined to obtain overall estimates (e.g. regression coefficients) and their standard errors. This approach has been built into many popular statistical packages, including SAS and Stata. The multiple imputation procedure has been employed with the wage data in the IAB establishment panel, and also as a means of releasing otherwise disclosive data.

Inconsistent results from various researchers working on the same dataset are often the result of missing values. Some use simple listwise deletion, others use advanced imputation methods. It is recommended that the national datasets arising from the implementation of the MEADOW Guidelines are all treated consistently concerning data preparation (‘cleaning’) and defining and handling missing values. In respect of imputation, the recommended approach would be either ‘*simple*’ imputation using the maximum likelihood (ML) approach and the expectation maximisation (EM) algorithm or, if resources allow it, ‘*multiple*’ imputation.

GUIDELINES:

- Use standardised, pre-validated classifications and coding schemes, where available and appropriate
- Consider possible data edits during questionnaire design
- Examine item non-response and, where necessary, consider advanced methods of imputation
- Implement all data cleaning, editing and imputation processes consistently across all national datasets

IV.3 Weighting

Weights arise in survey sampling in a number of different contexts. The following sections describe the range of scenarios that are relevant to the MEADOW Guidelines.

1) Weighting for unequal selection probabilities

Complex sample designs entailing variable probabilities of selection are often applied in the sample selection process to boost the prevalence of certain types of unit in the achieved sample (see the earlier section on “Varying the probability of selection”). In order to make statistically valid inferences for the population, the contribution of each case to a specific survey estimate must be weighted by an amount equal to the inverse of the selection probability ($w=1/p$) in order to obtain unbiased estimates for the study population³⁴.

³⁴ Here, it is not the absolute values of the weights which are important but their relative values. So weights could be scaled up or down to a more easily remembered and checked set of numbers.

In business surveys, the size of the employer unit is an important stratification variable. However, units may change in size over time. For instance, a workplace or organisation may grow between sampling and fieldwork, such that it acquires a sample-selection weight based on the relatively small size recorded on the sampling frame but is analysed along with larger workplaces/organisations based on its size at the time of interview (these would typically have a much smaller weight – see the earlier section on “Varying the probability of selection”). A unit may also change size from one stratum to another between two waves of data collection. When this happens, it can result in greater dispersion in weight values within analysis classes, which unduly inflates the standard errors associated with survey estimates. There are at least three methods for dealing with this problem in general (e.g. see Lee, 1995, for a review). One can either decrease the design weight of the stratum jumper and distribute the difference over the remaining units within the stratum, or one can reduce its values, or one can remove the unit entirely and treat it as non-response. Often, the first option is chosen for a design-weight adjustment.

2) Weighting for non-response

Surveys are subject to non-response biases when the non-response rates are not the same across all groups. For example, suppose that 1,000 manufacturing organisations were approached to participate in a survey, and also 1,000 educational organisations. The manufacturing sector responds at a rate of 80%, whereas the educational sector responds at a rate of 88%. As a consequence, the non-response mechanism has led to an overrepresentation of educational establishments in the achieved sample. In order to compensate for this overrepresentation, one has to assume that within subgroups (here: industrial sectors) the respondents are a random sample of all sampled establishments in that subgroup. Then, the response rate in the group represents a sampling rate. This assumption is referred to as the “missing at random assumption”, and is the basis for much non-response adjusted weighting. Therefore, non-response adjustment classes must be limited to those that can be formed from variables that are known for every sample unit in practice. Hence, a rich sampling frame becomes more important regarding the possibility of non-response correction using weights. As a result, the inverse of the response rate – in our example 1.25 and 1.14, respectively – can be used as weight to restore the respondent distribution to the original sample distribution ($w=1/r$). These adjustment weights then have to be used in conjunction with the sample-selection weight that adjusted for unequal probabilities of selection ($w=1/p \cdot 1/r$).

Opportunities to conduct non-response analysis and weighting are typically limited because of the narrow range of data that are typically provided on the sampling frame. However, in a multi-stage sample design (e.g. a linked employer-employee survey), there are more opportunities as the entire set of data collected at the first stage may be used in the analysis of non-response at the second stage. Relatively informative non-response adjustments can then be made, as in the case of the employee samples obtained from WERS (Chaplin et al, 2005) and REPOSE. The same is true in longitudinal surveys, where the data collected at one wave may be used in the analysis of non-response in subsequent waves, as in the WERS and IAB panels.

3) Post-stratification weighting

Another weighting procedure applied to many surveys is post-stratification. In this context, case weights are used to assure that sample totals are equal to some external total based on the target population (control totals). The weight is equal to the sum of units in the relevant subgroup population, divided by the sum of units in that subgroup in the achieved sample ($w=N/n$). Again, this must be used in combination with any sample-selection weight and non-response weight ($w=1/p \cdot 1/r \cdot N/n$).

Post-stratification of a first-stage sample thus relies on the availability of informative population data. Reidmann (2005) discusses the availability of population data on the size and structure of the population of establishments in a variety of European countries. Post-stratification is rather more straightforward in the case of a first-stage sample of employees because of the availability of the EU-LFS. In a multi-stage design, the first stage sample may of course provide population data for the second-stage sample. For instance, the achieved sample from the WERS 2004 Survey of Employees was post-stratified by gender so that the overall distribution of men and women matched that observed in the workforce data obtained from the achieved sample of establishments.

4) Weighting in multi-stage (linked employer-employee) surveys

Multistage sampling designs may use unequal probabilities of selection at each sampling stage, and multilevel models may be used to study the effect of variables measured among primary sampling units (PSUs) on outcomes among secondary sampling units (SSUs). For example, in an employer-first linked employer-employee survey, one might assess the importance of workplace characteristics in determining job satisfaction among employees. To adjust the estimation for the unequal probability of selection, sampling weights are assigned at one or both levels in the two-level model. Let P_j be the probability of selection for PSU j and let P_{ij} be the probability that individual i in PSU j is selected, given that PSU j is selected. The sampling weights for PSUs are then obtained by

$$W_j = \frac{1}{P_j}$$

and the sampling weights for SSUs are obtained by

$$W_{ij} = \frac{1}{P_{ij}}$$

with a combined weight for the SSUs – which takes account of sampling at both levels – being obtained by

$$W_{i,j} = \frac{1}{P_{ij}} \cdot \frac{1}{P_j} = W_{ij} \cdot W_j$$

If the sampling weights are ignored at either level the parameter estimates can be substantially biased (see Chesher and Nesheim, 2006, for an introductory discussion). In order to possibly correct for selectivity on the employee-level, as much information as possible about the organisation involved should be extracted and used in non-response analysis of the second-stage (employee) survey.

5) Weighting in longitudinal surveys

Longitudinal weighting follows the same principles as the cross-sectional procedure. Additionally, it takes into account developments over time. Longitudinal weighting has to reflect the process that units enter and exit the universe. While cross-sectional weighting is confined to adapt the structure of the universe at a given moment, longitudinal weighting has to refer to all units which belonged to the universe in at least one of the waves included in the reference period. Longitudinal weights have to be calculated in a way that cross-sectional structures are adequately reflected for each wave included in the reference period. Additionally, units which have entered the universe within the reference period must be correctly represented. The same applies to those units which were part of the universe at a given moment but did not belong to the universe afterwards.

With respect to employer level surveys, one of the most difficult challenges in a longitudinal framework is the handling of units which significantly grow or shrink over time, since one single weighting factor has to be calculated which is applicable for all waves within the reference period. Theoretically, it would therefore be necessary to define growing or shrinking units as separate groups in the longitudinal weighting process. But depending on the sample design the number of combinations could become very large. In most cases practical solutions have to be adopted which take into account movements between sizes but avoid over-complexity of the sampling process.

For the correction of disproportional panel attrition between two waves, specific analyses can be made taking into account practically all variables from the questionnaire of the last wave in which the non-respondents participated. The main explanatory factors – in a statistical sense – can then be identified by means of multivariate analysis (see Chaplin, 2005, for an example using the WERS Panel Survey). These results can be used as one step in the longitudinal weighting procedure.

Longitudinal weighting is a highly complex process. Indeed, the process of weighting the IAB Establishment Panel involves a total of eight separate stages. The variety of variables that should ideally be taken into account is (often) much larger than that which the net sample size reasonably allows. Therefore, in the longitudinal weighting process a number of practical compromises have to be made. The ultimate goal is a fairly adequate reproduction of each cross-section within the reference period as well as an adequate reproduction of the dynamics. It is self-evident that the result of the longitudinal weighting procedure can only be a more or less good approximation.

6) Use of weights in analysis

In the presence of unequal probabilities of selection, as noted above, one must account for the sample design by applying weights to the data during analysis, if one wishes to obtain unbiased population estimates. This is true of all descriptive analysis, unless one is examining subgroups in which the selection probabilities were constant. In regression analyses, one does not require the application of weights in order to obtain unbiased coefficients, so long as the covariates account for the variations in selection and response probabilities. One can check this by comparing weighted and unweighted estimates produced by the model. If there is no variation in the model coefficients, the sampling biases have been accounted for through the specification of the model; otherwise, weighted coefficients should be relied upon.

The issue of variance estimation is a separate, although connected, one. Stratification, multistage sample selection, unequal probabilities of selection, clustering, and imputed values are features of survey data that all require nonstandard procedures to estimate variances correctly. This is because the standard textbook formulae for variance estimation assume a simple random sample design. The use of unequal probabilities of selection and clustering, in particular, can have a substantial impact in causing the true sampling variance to depart from that which would be estimated under the assumption of simple random sampling (Lohr, 1999). The true standard errors are typically larger, and so adopting an assumption of simple random sampling can lead to Type I errors. There are three common variance estimation procedures that handle the special features of survey data (see also Groves et al. 2004).

The *Taylor Series approximation* is a commonly used tool in statistics for handling variance estimation for statistics that are not simple additions of sample values. They have been worked out analytically for many kinds of statistics, and for stratified multistage sample design with weights. Taylor Series estimation is perhaps the most common approach to estimate the sampling variance of means and proportions in complex sample designs as the currently most popular software packages utilise this approach. The *Balanced Repeated Replication* and the *Jackknife Replication* take an entirely different approach. Rather than attempting to find an analytic solution to the problem of estimating the sampling variance of a statistic, they rely on a repeated subsampling. The strength of this approach to estimate the sampling variance of a statistic is that it can be applied to almost all kind of statistic – means, proportions, regression coefficients, and medians. But using these procedures requires thousands of calculations made feasible only with high-speed computing.

The variance estimates obtained from each of these three approaches are remarkably similar for a given statistic and data set. There is little reason to choose one method over the other, except that estimation via the Taylor Series approximation is typically faster. Each method is commonly available in standard statistical packages, including Stata, SPSS and SAS.

GUIDELINES:

- Weighting for unequal probabilities of selection is essential
- Non-response weighting and post-stratification should also be considered, where possible
- Take proper account of any departures from simple random sampling in analysis

IV.4 Dissemination

1) Advantages of open dissemination

Innovative scientific research has a crucial role in addressing global challenges. The speed and depth of this research depends on fostering collaborative exchanges between different communities and assuring its widest dissemination. The exchange of ideas, knowledge and data emerging is fundamental for human progress. The rapid development in computing technology and the Internet have opened up new applications for the basic *sources* of research — the base material of *research data* — which has given a major impetus to scientific work in recent years. Databases are rapidly becoming an essential part of the infrastructure of the global science system.

The OECD (2007) has developed principles and standards to facilitate access to research data generated with public funding. It notes that improved access to, and sharing of, data:

- Reinforces open scientific inquiry;
- Encourages diversity of analysis and opinion;
- Promotes new research;
- Makes possible the testing of new or alternative hypotheses and methods of analysis;
- Supports studies on data collection methods and measurement;
- Facilitates the education of new researchers;
- Enables the exploration of topics not envisioned by the initial investigators;
- Permits the creation of new data sets when data from multiple sources are combined.

The Guidelines therefore advocate the principle of open access to data, in so far as this can be achieved without compromising the rights of respondents (see below). The Guidelines also advocate that data arising from their implementation are made publicly available in a timely manner, e.g. within 12 months of the completion of the primary analysis, and at no more than marginal cost.

2) Ethical and legal framework

Ethical concerns about privacy imply that researchers should respect the potential respondent's right to determine the level of public scrutiny to which they or their business is exposed. This requires not only that researchers respect any decision not to participate in research, but also that any information which is passed to the researcher in confidence should remain so. Such information may include personal contact details or information that is more directly related to the topic under study.

A further ethical consideration is the protection of businesses or individuals from direct harm as a result of participation in the research. Research within government is undertaken to enable policy makers to improve the economy and society. Accordingly, whilst policy changes may result in benefits or costs to groups of persons or businesses, the research process should not result in direct, harmful action against specific individuals or businesses (Habermann, 2006). For example, the participation of a business in a research project about levels of compliance with certain regulations should not result in legal action against that business for any non-compliance that has been identified (Forth and Webster 2008)³⁵.

From a legal point of view, there does not seem to be any regulatory protection for human subject research outside biomedical areas in Europe (Groves et al. 2004). However, national data protection acts have to be taken into account when conducting an (international) survey. In addition, the European Union does have regulations designed to safeguard the confidentiality of personal data.³⁶ Article 285 of the Treaty establishing the European Community provides that the production of Community statistics shall conform to impartiality, reliability, objectivity, scientific independence, cost-effectiveness and statistical confidentiality. The confidentiality principle is therefore part of the European basic constitutional charter and has thus acquired the highest status in legal terms. The principle has also been further specified. In 1990, Council Regulation 1588/90 on the transmission of data subject to statistical confidentiality to the Statistical Office of the European Community set out basic rules and safeguards for the handling of confidential data. Subsequently, in 1997, the "Statistical Law" - EU regulation 322/1997 on Community Statistics - expanded on these basic rules. In particular, a legal definition of statistical disclosure was introduced. Article 13 states: "*Data used by the national authorities and the Community authority for the production of Community statistics shall be considered confidential when they allow statistical units to be identified, either directly or indirectly, thereby disclosing individual information. To determine whether a statistical unit is identifiable, account shall be taken of all the means that might reasonably be used by a third party to identify the said statistical unit.*" The Statistical Law also states that confidential data must be used exclusively for statistical purposes unless the respondents have unambiguously given their consent to the use for any other purposes.

Statistical confidentiality is regulated at EU level only to the extent to which statistical activities are carried out by Eurostat and the national statistical authorities for the production of Community statistics are concerned. Specific confidentiality regimes still coexist at national level and differences may appear with the EU statistical confidentiality regime. As the existent statistical confidentiality regime is not unified in one regulation, this can lead to difficulties of interpretation between Member States and the Commission. The lack of harmonisation of disclosure protection measures between Member States can thereby hamper the release of European data.

³⁵ A set of ethical standards of this nature is set out in the RESPECT code of practice, which is a voluntary code covering the conduct of socio-economic research in the EU (<http://www.respectproject.org/code/>). The International Statistical Institute's Declaration on Professional Ethics (<http://isi.c.nl/ethics.htm>) also provides a detailed ethical code which constitutes a valuable further reference point. All countries that participate in the European Social Survey are required to sign up to this code.

³⁶ The remainder of this section is taken from Rik Huys' useful paper on 'Access rights to surveys', MEADOW Background document n°3 produced in Year 1 of MEADOW project, available at <http://www.meadow-project.eu/index.php?/Article-du-site/Background-documents.html>

3) Minimising the risk of disclosure in data sharing and linking

Common means of “disclosure limitation” can be seen in administrative procedures to limit the identifiability of survey materials or restricting the contents of the survey data that may be released. Here, there are common practical steps usually taken by researchers to limit the likelihood of inadvertent disclosure:

- As soon as practical, names, addresses, phone numbers, or other directly identifying information should be separated;
- The level of geographic detail coded into the file should be restricted so that small sets of respondent data cannot be identified with a small spatial area (this may affect analytical variables)
- Quantitative data should be examined (both univariate and multivariate) to search for outliers that may lead to identification.

Methods to identify a possible risk of disclosure are, for example, described in Doyle et al (2001). But when examination of the data suggests properties that threaten inadvertent disclosure, a variety of statistical procedures can be taken to reduce the risk of disclosure while limiting the impact on survey estimates (Groves et al. 2004):

- “Data swapping”, which is the exchange of reported values across data records (Fienberg *et al.* 1996). Clearly, the challenge in swapping is whether the values of statistics computed from the dataset after swapping are close to those obtained before swapping.
- “Recoding methods”, which change the values of cases that are outliers. These cases have a greater likelihood of being unique in the sample because of their extreme values. Recoding places them into a category shared with others cases. The loss of information affects certain classes of statistics whose estimates are influenced by the tails of the distribution (e.g. the mean).
- “Perturbation methods”, which use statistical models to alter individual data values. For example, the value of a randomly generated variable might be added to each data record’s value on some items. If the average value of the generated variable equals zero, sample means are maintained but at the cost of higher total variance of the means because of the additional “noise” of the random variable. If covariances between variables are to be unaffected by the perturbation, then joint perturbations need to be performed. Generally, the greater the amount of noise added to the variables, the greater the protection but the higher the loss of information (Groves et al. 2004).
- Finally, “imputation methods” replace the value of a variable reported by the respondent with another value obtained from an imputation process. Using imputations to prevent disclosure, Rubin (1993) was the first to suggest the creation of a totally “synthetic data set”.

Since each of these methods involve some loss of information, there is an increasing emphasis on the use of secure environments (data labs) as one means of reducing the risk of disclosure from datasets which cannot be wholly purged of disclosive information. This is the approach taken by Eurostat with respect to confidential data sets. There are two broad approaches to the provision of data in secure environments: remote access; and remote execution. Remote execution involves the analyst submitting scripts on-line for execution on disclosive microdata stored within an institute’s protected network. If the results of the analysis are regarded safe data, they are sent back to the submitter

of the script. Otherwise, the submitter is informed that the request cannot be acquiesced. This is the approach taken by Statistics Canada in respect of analysis by external users of their Workplace and Employee Survey and by the German IAB in respect of access to their linked employer-employ panel data. Remote access, on the other hand, provides the analyst with on-line access to the disclosive microdata, but within a secure network from which no results may be extracted without the data custodian’s permission. This allows the custodian to release only those results which are non-disclosive.

Remote execution is the more economical option, but remote access has the advantage of providing the analyst with full access to the microdata under a high degree of control. In the past, remote access systems have suffered from the disadvantage of restricting access to specific locations (as in the case of the UK NSO’s Virtual Micro-data Laboratory). However, new methods are being developed which permit remote access off-site. For instance, the Data Enclave established by the National Opinion Research Centre (NORC) at the University of Chicago provides for remote access from a pre-defined set of (off-site) IP addresses (<http://www.norc.org/DataEnclave>), whilst the MONA system developed by Statistics Sweden provides users with secure access to disclosive databases from practically anywhere that can provide Internet access (Soderberg, 2005). The Economic and Social Data Service in the UK are testing an equivalent infrastructure (Woollard, 2009). As a result, secure environments are becoming an increasingly attractive means of facilitating secondary analysis of disclosive datasets.

4) Minimising the risk of disclosure in reporting

The methods described above may be used to limit the disclosiveness of datasets, but estimates contained in primary analysis of the data (reporting) may also be disclosive. Tabular data in employer level surveys face the problem that cells in a cross-tabulation may contain a small number of cases revealing attributes of known employers. As noted by Felsö et al. (2001), some national statistical institutes may apply complex rules for identifying cells which are potentially sensitive (e.g. the (n, k) rule, in which a cell is judged sensitive if a small number (n) of respondents contribute a large percentage (k) to the total cell value). However, such rules are complicated to apply in practice and so the MEADOW Guidelines propose a more straightforward rule which suppresses all estimates based on fewer than 10 observations. This is the rule applied to the analysis of business data held in the secure data centre at the UK Office for National Statistics. After a cell is identified as sensitive, then various alterations can be made. “Suppression” rules may be used to omit some statistics from the table. As an alternative to suppression, categories of one of the variables may be recoded or combined to prevent disclosure (Groves et al. 2004).

GUIDELINES:

- Seek to make the survey data publicly available, in so far as this can be done without compromising the rights of survey respondents
- Take the necessary steps to ensure that respondents remain anonymous in publicly-available data, preferably by limiting the identifiability of survey materials or restricting the contents of the survey data that may be released, rather than by restricting access more broadly.

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Appendix: Classifications

Introduction

This section focuses on the different methods of classifications that are available and which could be used as the basis for coding or analysis in a cross-national survey of employers and employees. The areas that this section will look at include: occupation, education, industry, firm size, and ownership. Each sub-section evaluates the pros and cons of each possible classification method before putting forward a recommendation as to the best available classification method for this project. It is a general principle that we seek to identify established international classifications that are used in all countries and are comparable across countries.

³⁷ Much of the discussion that follows is based on the information provided at the ISCO website. For more details see <http://www.ilo.org/public/english/bureau/stat/isco/index.htm> and the links therein.

Occupation

To classify occupations it is necessary to use the International Standard Classification of Occupations (ISCO)³⁷. ISCO sorts jobs into well considered groups according to the type of job and the activities that the job entails. The clear aim is to *measure the level of skill required to do the job not that which is held by the employee in the job*. ISCO-88 is the current version of ISCO, although a new, updated version, ISCO-08 was endorsed by the ILO in March 2008 in preparation for national censuses. ISCO-88 (COM) is a variant of ISCO-88 that implements ISCO-88 for census and survey coding purposes in a coordinated manner for the first 12 member states of the EU. It has now been implemented across all 30 EU member states. (Elias and Birch, 2006). No such (COM) variant has been deemed necessary for ISCO-08.

Elias (1997) provides a broad discussion of the use of ISCO-88 and finds that it has become widely applicable across many nations and is very successful. However, he does raise the issue of the reliability of occupational measures in general, which can be very subjective and weak. Elias suggests that when comparing occupations across countries using ISCO 88 it would be best to compare data using the sub-major group level. Budlender (2003) presents a review of ISCO 88 and of what (if anything) needed changing in the classification of occupations by the ILO. She concludes that there is no other classification system that is as good as ISCO-88 when looking at *more than one country*. Her report also suggested that ISCO 88 did not need major revisions in the framework of the coding but only updating in the measures of occupations and in the placement of some occupations and sub-categories within the classification. Finally, Elias and Birch (2006) discuss the comparability issues in the use of ISCO-88 (COM) and the resulting meetings that took place to find those areas that needed updating from an EU perspective for ISCO 08. Their report suggested that there was a need to improve the definition of managers, that there was a need to add some measures of supervisor as an occupation in areas where such a job is often found, and finally that there should be the addition of a new minor group of 'administrative professionals' within the minor group 'Business professionals'³⁸.

Many current EU-wide surveys use ISCO-88 as their classification scheme for occupations. For example the European Working Conditions Surveys (EWCS) and the European Survey of Information Society (ESIS) use ISCO-88 to classify the occupations as stated by respondents to their surveys. However, given that ISCO-08 will become the standard measure of classifying occupations, it is recommended for any future implementation of the Guidelines. There is, nonetheless, only limited knowledge to date on the methods used in implementing the classification.

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³⁸ This new minor group of occupations already exists within ISCO 88 (COM) but is aimed solely at public sector workers.

of the Guidelines. There is, nonetheless, only limited knowledge to date on the methods used in implementing the classification.

GUIDELINE:

Code occupations using ISCO 08.

Education

There are three major classifications of education which are of relevance: ISCED, CASMIN and the EQF. This section will look at each in turn before recommending the most useful classification for education.

The international standard classification of education (ISCED) is an internationally comparable way of classifying various levels of education. ISCED allows for national education measures to be compiled and presented in a comparable manner across nations. The current version in use is ISCED 1997. The levels of education that can be achieved within nations can be transferred to an international classification. The common levels of education are shown in Table A1 below. In terms of international surveys, the Eurostat Task Force on Core Social Variables states that educational attainment should be coded to ISCED 97 levels 0-6 as a minimum. (Eurostat, 2007) As a result, international surveys such as the EWCS use ISCED as the classification scheme for education.

Table A1: ISCED 1997³⁹

Level	Learning
Level 0	Pre-Primary Education
Level 1	Primary Education or First Stage of Basic Education
Level 2	Lower Secondary or Second Stage of Basic Education
Level 3	(Upper) Secondary Education
Level 4	Post-Secondary Non-Tertiary Education
Level 5	First Stage of Tertiary Education (Not leading directly to an advanced research qualification)
Level 6	Second Stage of Tertiary Education (Leading to an advanced research qualification)

The Comparative Analysis of Social Mobility in Industrial Nations (CASMIN) classification of education is an alternative which looks at two main criteria in terms of classifying education: first, there are the differences between education levels, in terms of length, the necessary ability that is needed and the contents; and secondly, there are differences between a general education and a vocational education. There are eight levels in the CASMIN classification scheme. Some find a stronger correlation between edu-

³⁹ ISCED can also be coded 0-7 with no number 4, but for ease here the scale is numbered continuously from 0-6.

⁴⁰ See <http://www.nuffield.ox.ac.uk/Users/Yaish/NPSM/Casmin%20Educ.pdf> for more information.

cation and occupation when using CASMIN than when using ISCED (Kerckhoff, Ezell and Brown, 2002). However, the CASMIN classification scheme was developed in the 1970s and so it has become dated over time as education has changed. There have been suggested updates to CASMIN, but only for France, Germany, Hungary and the UK. Therefore, this classification of education cannot be seen as a useful one for the purposes of this project.⁴⁰

Finally, the European Qualifications Framework (EQF) is the framework to commonly link EU member states education systems so that workers can become more mobile within the EU and so that there can be more emphasis on lifelong learning. As a result the EQF classifies education according to the learning outcomes – what an individual knows, understands and is able to do – rather than the more common measure of looking at learning inputs, such as ISCED. The EQF has 8 levels of learning outcomes. National education systems should, it is anticipated, be related to the EQF by 2010 and individual qualifications should be mapped to EQF by 2012. As the EU is committed to using EQF in the future to allow more flexibility and transparency in education it would seem useful to use this where it is available, and it would seem to provide the way forward in the future rather than the somewhat problematic ISCED classification. However, given the international comparability of ISCED beyond the borders of the EU, and its greater historical compatibility, it would prove useful to also use this as a classification scheme. In essence the two measures are broadly comparable; they are just looking at different ends of the education experience: inputs and outputs.

GUIDELINE:

Code qualifications under ISCED and, where appropriate mapping available, under EQF.

Industry

The General Industrial Classification of Economic Activities within the EU (NACE) designates the various statistical classifications of economic activity developed since 1970 in the EU. NACE categorises various enterprises and organisations into groups based on their main activity. The enterprises and organisations will have similar production processes, inputs into the process and final output. Each member state of the EU is bound by EC regulation which means that their national industrial classification must be based on NACE.⁴¹

NACE rev. 2 is the current version of the industry classification used by the EU. The revision from NACE rev. 1.1 in 2008 brought the European industrial classification into line with other international classifications of economic activity.⁴² NACE rev. 2 is consistent with ISIC rev. 4 which is the UN statistical classification of activities. Because all national classifications of economic activity have to be at least based on NACE there should be a large level of comparability across countries. Indeed the EU Labour Force Survey

⁴¹ Commission Regulation (EEC) No 3037/90 first did this for NACE rev. 1, which was amended with Commission Regulation (EEC) No 761/93 and then revised for NACE rev. 1.1 by Commission Regulation (EEC) No 29/2002. Regulation (EEC) No 3037/90 has now been repealed and Regulation (EC) No 1893/2006 now requires member states to use NACE rev. 2 for the statistical classification of economic activities.

⁴² For more information on NACE rev. 2 and its structure see <http://circa.europa.eu/irc/dsis/nacecpacon/info/data/en/index.htm>.

classifies economic activity using the three digit level of NACE for the main job and two digit level for other jobs.

GUIDELINE:

Code industrial activity using NACE rev. 2.

Firm size

When looking at firm size the classification that is relevant is the small and medium enterprise. This can be measured differently from one country to another in legal terms. The EU defines Small and Medium Enterprises (SMEs) as firms with less than 250 employees, which can fall into three types: micro (1-9 employees), small (10-49) and medium (50-249)⁴³. A large enterprise has more than 250 employees⁴⁴. To qualify as an SME an enterprise must also satisfy criteria on independence, and then either on turnover or on balance sheet total (see table A2).

Table A2 : EU Small and Medium Enterprise definitions

Enterprise Category	Headcount	Annual Turnover	Annual Balance Sheet Total
Medium	< 250	≤ €50m or	≤ €40m
Small	< 50	≤ €10m or	≤ €10m
Micro	< 10	≤ €2m or	≤ €2m

Source : http://ec.europa.eu/enterprise/enterprise_policy/sme_definition/sme_user_guide.pdf

As a result, any attempt to come into line with this classification will require data to be collected not only on firm size but also on turnover / total balance sheet (or alternatively, for such data to be available from the sampling frame or through data matching to external databases). Moreover, these items should be measured for the whole enterprise across all relevant countries. This would be a departure from some existing surveys (e.g. WERS) which focus solely on employment in the country hosting the survey.

GUIDELINE:

The classification scheme for firm size should use categories that can be reduced to the four bands that are in line with the EU definition for SMEs.

Ownership

There is no EU wide measure of ownership in terms of either foreign ownership or private and public sector. It is very likely that different countries will have different legal business structures, therefore when considering what classification scheme to use, it

⁴³ This definition of an SME is from the Commission Recommendation 2003/361/EC which came into force on 1st January 2005.

⁴⁴ See http://ec.europa.eu/enterprise/enterprise_policy/sme_definition/sme_user_guide.pdf for a full discussion of the new recommendation on the definition of SMEs. –

will be necessary to bear this in mind and use a simple classification scheme that will map onto existing legal structures in all member states.

Private/Public

The EU definition of public corporations are any: 'resident corporations and quasi-corporations that are subject to control by government units'. This includes the general government sector plus government-controlled entities, known as public corporations, whose primary activity is to engage in commercial activities. The Systems of National Accounts 1993 (SNA 1993) sets out the full definition of what constitutes as the public sector.⁴⁵

Current EU policy on enterprises is based on promoting: entrepreneurship, innovation, simplification of the regulatory and administrative environment, obstacle free and fair access to markets within the EU, and European competitive performance amongst other things.⁴⁶ From this the only specific requirement as such that would be useful to link to EU policy is to separate those firms that are for profit enterprises and those that are not.

GUIDELINE:

Separately identify: public sector, for profit organisation, or non-profit organisations.

Foreign ownership

The EU defines foreign ownership of an EU company to be when the group head (a legal unit that is not owned directly or indirectly by another) or ultimate beneficial owner (the firm that is not owned by more than 50 per cent by another unit as you move through the chain of ownership) is based in a country outside of the EU.⁴⁷ But one can also think about foreign ownership at the national level (rather than at the EU level). In this respect, one obvious possibility, in the absence of other standards, is to consider whether the enterprise is under majority domestic or foreign ownership. Three possible categories (as used in the ESWT) would be: predominantly domestically owned (51% or more); equally domestically and foreign owned; predominantly foreign owned (51% or more).

GUIDELINE:

Determine whether firms are predominantly nationally owned, EU owned or foreign owned.

⁴⁵ For more information see <http://www.imf.org/external/pubs/ft/gfs/manual/pdf/all.pdf> which describes the government sectors and public sector in more detail.

⁴⁶ See http://ec.europa.eu/enterprise/index_en.htm for more information on the EU's policies towards enterprise and industry.

⁴⁷ See http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=DSP_GLOSSARY_NOM_DTL_VIEW&StrNom=CODED2&StrLanguageCode=EN&IntKey=16473685&RdoSearch=BEGIN&TxtSearch=foreign&Cb oTheme=&IntCurrentPage=1 for more details.

Guidelines appendix

**Synthesis report on
pre-testing
employer
and employee
questionnaires**

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Introduction

The lack of harmonised European data on organisational change and practices has limited our ability to compare and benchmark policies for knowledge development, performance and outcomes. One of the Meadow project objectives is to fill this gap by developing questionnaires for the collection of harmonised data on the dynamics of organisations and work and their effects on economic and social impacts across the EU member states. Two questionnaires were developed: one for employers and one for employees.

In order to fully capture the economic and social effects of organisational practices, the target population for the questionnaires are employers and employees across three dimensions. The first dimension consists of all sectors of economic activity, including private enterprises and public sector organisations and manufacturing and service sectors. The second dimension consists of the size of enterprises and organisations, encompassing small, medium and large units.¹ The third dimension consists of the nationality of economic units, which can be based in all EU member countries. In addition, many of the questions also contain a time dimension, with the questionnaire respondents being asked about events that occurred two years earlier as well as events that occurred at the time of the survey.

In order to provide harmonised, high quality data, all questions in each questionnaire must be understandable and answerable by respondents from each dimension. This requires questions to be understood in the same way by respondents from different cultural and linguistic areas, working in different sectors, and employed by firms or organisations of vastly different sizes. Consequently, in order to develop measures that can provide comparability across countries, the questions need to be carefully designed to avoid differences in translation from one language to another and to be applicable to a wide range of circumstances. For example, the questions must obtain comparable and accurate responses from employees in small manufacturing establishments located in France as well as from employees working for a large public sector organisation located in Italy.

To minimise problems and increase comparability, identical questions are used, regardless of sector or size. There is one exception: some of the questions can vary, depending on whether the employer of the private or the public sector.²

The development process for each questionnaire was designed to meet the requirements for harmonised data. First, the project partners identified a core set of indicators at the employer and employee level and developed questions that could provide the

¹ The project used a lower cut-off of 20 employees. Small firms or organisations therefore consist of 20 to 49 employees, medium firms or organisations of 50 to 249 employees, and large firms or organisations of 250 or more employees.

² For example, a question on ownership is only asked of employers from private sector firms. In a question on the causes of a decline in employment, an additional question for public sector employers asks about budgetary cuts.

necessary data to produce these indicators. Second, the questions were reviewed by the project partners and revised accordingly, resulting in draft employee and employer questionnaires. The third step, which is the focus of the Guidelines appendix, consisted of two rounds of cognitive testing of the translated questionnaires in ten countries. The first round of testing identified problems with some of the questions. These questions were then revised and tested in the second round. The final employer and employee questionnaires are therefore based on the expertise of the project partners and two rounds of cognitive testing.

The cognitive testing process used face-to-face interviews with a selected group of managers and employees from both the private and the public sectors in several participating countries, giving a total of 247 interviews. The managers were drawn from private and public sector establishments that represent a variety of sectors and sizes in order to capture a range of organisational structures. The selection process stressed the participation of a diversity of workplaces rather using a random sample.

Cognitive testing can identify problems with meeting each of five goals for good question design:

- High face validity - the question addresses the right issues from the perspective of the respondent.
- High content validity - the responses measure what the researchers want to measure (each question is interpreted by the respondents as intended).
- High reliability - the responses are accurate, unaffected by differences in the type of respondent, and with good sensitivity (few false negatives) and specificity (few false positives).
- Where relevant, the questions can measure changes over time (avoiding memory telescope effects).
- Minimise bias from socially desirable responses, for instance in response to questions on employee responsibilities.

Of note, cognitive testing is unable to identify all possible problems with a questionnaire. The next step, which was not covered in the Meadow project, is to conduct a small-scale pilot survey. This is particularly important to assess reliability.

The remainder of this synthesis report describes the cognitive testing, the types of problems that were encountered, and the proposed solutions.

The cognitive testing

The cognitive testing focused on structured survey questions and definitions, translated from English into the national language of seven countries and tested in ten countries (Denmark, Finland, France, Hungary, Italy, The Netherlands, Sweden, Ukraine, the United Kingdom and the United States). Testing involved both workplace managers (employers) and employees in the private and public sectors. Table 1 provides a brief summary of the testing protocol and the timeline.

Sample specification

The interviewees were not randomly selected, but an effort was made to draw interviewees from a diverse range of organisations and occupations that would be covered in a full survey. For example, the Guidelines cognitive testing instructed national partners to draw a specified number of employers and employees from private establishments and public sector organisations and to stratify the sample for employers by the sector and size of the firm or public sector organisation. Employees were drawn from a range of occupational categories. There was no need to match employees and employers to the same workplace. The sample could draw on personal and business contacts, as long as they had not been over used for this purpose, for instance to test several other questionnaires.

Table 1: Testing protocol and timeline

Timing	Steps
March, 2009	Translation of each questionnaire, using a designated adjudicator
End March 2009	Interviewers and respondents identified Guideline on cognitive testing sent to the interviewers Contact letter sent to potential interviewees
April, 2009	Translation completed and delivered to national teams responsible for the cognitive testing.
April, 2009	Questions divided into three sets for cognitive testing: 1. Simple questions that do not need to be field tested. 2. An 'A' set of logically coherent questions for testing. 3. A 'B' set of logically coherent questions for testing.
April 2009 to October 2009	Cognitive testing in two phases.
November 2009	Completion of final version of each questionnaire

Confidentiality

The interviewees were offered full confidentiality. Respondents were assured that their names and any information gathered about them would be held in the strictest confidence, would be used only for the purposes of the study, and would never be released in any form that would allow individuals to be identified.

Information about individual respondents was not made available to anyone outside the immediate research project team, including other teams participating in the MEADOW project.

Sample size

A total of 247 interviews were conducted between phases I and II. In Phase I there were 156 interviews (73 for employers and 83 for employees) while in Phase II there were 91 interviews (45 for employers and 46 for employees). The number of interviews by country ranged from one interview in Finland to 43 interviews in Denmark. Wherever possible, the cognitive testing used face-to-face interviews.

The majority of the establishments (either of the employee or the employer), were in the tertiary sector (179/247), in large firms with more than 250 employees (112/247), and in the private sector (168/247). Table 2A gives the number of interviews by country and Table 2B provides information on the sector, size, ownership, and date of establishment of the workplace.

Table 2A: Number of interviews per country of ownership of employer's establishment

Country	Phase I			Phase II			Total both Phases
	Em- ployer	Em- ployee	Total Phase I	Em- ployer	Em- ployee	Total Phase II	
Denmark	13	10	23	11	9	20	43
Finland	1	0	1	0	0	0	1
France	6	7	13	7	4	11	24
Hungary	9	8	17	3	3	6	23
Germany	0	3	3	0	0	0	3
Italy	12	13	25	6	6	12	37
Netherlands	4	14	18	4	10	14	32
Sweden	11	10	21	6	4	10	31
Ukraine	2	2	4	0	0	0	4
United Kingdom	10	9	19	4	3	7	26
United States	5	4	9	4	4	8	17
Mixed background*	0	3	3	0	3	3	6
All countries	73	83	156	45	46	91	247

* Two or more countries of ownership due to mergers, partnerships, joint-ventures, etc.

Table 2B: Breakdown of interviews – Phases I and II

	Employer			Employee			Employer + Employees
	Phase I	Phase II	Total	Phase I	Phase II	Total	Total
Economic Sector							
Resources	1	0	1	1	1	2	3
Manufacturing	24	10	34	22	8	30	64
Services	48	35	83	59	37	96	179
Not specified	0	0	118	1	0	1	1
Size of Firms							
Small (10 to 49 employees)	15	13	28	18	8	26	54
Medium (50 to 249 employees)	16	15	31	17	14	31	62
Large (250 + employees)	38	15	53	40	19	59	112
Not specified	4	2	6	8	5	13	19
Ownership							
Public Sector	17	14	31	24	16	40	71
Private sector	50	31	81	57	30	87	168
Not specified	6	0	6	2	0	2	8
Date established							
Before 2000	60	24	84	67	29	96	180
After 2000	11	8	19	13	7	20	39
Not specified	2	13	15	3	10	13	28
Total	73	45	118	83	46	129	247

Contact

In order to set up the interviews, the following guidelines were followed:

- Interviewees were contacted by mail or email.
- Once accepted, a reminder letter (or email) was sent for the date, time and purpose of the interview.
- A copy of the questionnaire was intentionally not sent in advance, to ensure that the interviewees were unable to reflect on the questions before the interviews. Cognitive testing requires that interviewees receive the questions in a similar manner as in a full survey, which would allow no time for reflecting on the meaning of a question.

The interviews were designed to last no longer than 1 hour.

Testing stages

Testing was conducted in 5 stages.

Stage 1: Before the cognitive testing, the questionnaires were tested among the MEADOW researchers. Several changes to the questions were made as a result. In addition, the employer and employee questionnaires were too long to be tested in a one hour interview. Each questionnaire was therefore divided into three parts: questions that had been tested in other surveys and which did not require additional testing, a group 'A' set of logically cohesive questions, and a group 'B' set of logically cohesive questions.

Stage 2: Phase I interviews were conducted on both the 'A' and 'B' groups of questions. The cognitive testing obtained the following types of information:

- Did each question get the information it was intended to get?
- Were all words understood?
- Were the questions interpreted in the same way by all respondents?
- Did all closed questions have an answer that applies to each respondent?
- Were the questions answered correctly and in a way that could be understood?
- Did any part of the questionnaire suggest bias?

In summary, this step determined if the respondents understood the questions as intended and whether or not they could answer them accurately. We also collected suggestions for improvements.

Stage 3: After the interviews were completed, each interviewer summarised his or her findings on a question-by-question basis, entering comments into an electronic form of the survey questionnaire. The comments from all countries were then analysed to provide a complete review of the tested questions. Problematic questions were revised, in part using the suggestions of the interviewees. The revised questions were then sent to members of the MEADOW research project for comments.

Stage 4: All revised questions from Stage 3 were tested in Phase II interviews to determine if the questions were now easier to understand and answer. As for Stage 3, the

comments were compiled and analysed, with the results used to make final changes to the questions. Some questions were deleted because no satisfactory solution was found for identified problems.

Stage 5: Draft final versions of each questionnaire were circulated among the MEADOW group for final comments. A final check was conducted to identify any errors not detected in the previous stages.

Table 3 provides a summary of the main goals of the cognitive testing. Of note, the cognitive testing process did not evaluate the effect of question order on the responses. Question layout and formatting was not tested because both questionnaires were designed to be read aloud during a telephone interview.

Table 3: Main goals of cognitive testing

General Goals	Specific Goals
Understanding of complete questionnaire	Due to length, the entire questionnaire was not tested.
Understanding of individual questions	Question wordings that make items difficult to understand or answer
Detection of covert and overt problems	Vocabulary that might be specialised or unfamiliar
Minimising response error	Response scales that might be difficult to interpret
	Response options that might be incomplete and / or inappropriate
	Questions that are overlapping or redundant
	Questions that are inappropriate, insufficient or prone to misunderstandings or 'satisficing' responses
	Identification of questions that respondents can not answer
	Other important issues that were not covered by the draft questionnaire

Employer Questionnaire

Phase I interviews

Interviews were conducted with employers who were owners, CEOs, directors, head of departments, head of divisions, and managers. The average length of the interviews was approximately 60 minutes.

Employers from 73 establishments were interviewed in Phase I, of which 33 responded to questionnaire A and 40 to questionnaire B (see Table 4). The majority of the establishments (68 out of 73) were in Europe and 5 in the United States. As shown in Table 2B above, 17 interviews were conducted with employers from public sector organisations and 50 interviews were with employers from private enterprises.

**Table 4: Country of ownership of employer's establishment
First round of employer interviews**

Country	Number of interviews		
	Questionnaire A	Questionnaire B	Total
Denmark	6	7	13
Finland	-	1	1
France	2	4	6
Hungary	4	5	9
Italy	6	6	12
The Netherlands	2	2	4
Sweden	5	6	11
Ukraine	1	1	2
United Kingdom	4	6	10
United States	3	2	5
Total	33	40	73

As shown in Table 2B above, 48 of the 73 first round interviews were conducted in the services sector, followed by 24 interviews in the manufacturing sector. Most establishments were large with 250 or more employees, followed by a balanced number of small (less than 49 employees) and medium-sized firms (between 50 and 249 employees), with around 15 establishments each. Most establishments were from the private sector and established before the year 2000.

Phase II interviews

The second round of employer interviews used only one questionnaire which included all questions from the A and B group that needed to be retested. Interviews were conducted with managers from 45 establishments. The majority of the managers (41 out of 45) were located in Europe and 4 in the United States (see Table 2A).

As with the first round, most of the second round interviews were conducted with managers from the services sector (35/45), followed by the manufacturing sector (10/45) (see Table 2B). Establishments were nearly equally split among large (more than 250 employees), medium size (between 50 and 249 employees) and small ones (less than 49 employees). The majority of establishments was from the private sector (31/45) and had been established before the year 2000 (24/45).

Results for Phases I and II

The results for both the first and second interview rounds are reported together, as the main purpose of the reporting is to illustrate the types of problems that were identified in the first round of interviews, the solutions proposed and re-tested in the second round, and the final versions. Some adjustments were minor, and the questions did not need to

be re-tested in phase II. In a few cases, we opted to delete questions or to replace them with other questions that could provide similar information.

Employer – Summary of Findings

The cognitive testing identified many questions for which there were no or only minimal problems. As an example, almost all respondents were able to provide retrospective data on conditions in their enterprise or organisation two years earlier.

A few questions had to be deleted. This was due to a lack of understanding, inaccurate or misleading responses, or because true responses were avoided by respondents. For some of the deleted questions, the underlying concepts could be obtained through other existing questions in the questionnaire or through completely new questions. Moreover, a few questions were deleted as their main purpose was not clear. Most questions on the use of specific types of ICT had to be deleted because the majority of respondents either could not answer them or tried to answer but clearly did not understand the technology. As a result, a separate ICT module was developed for respondents that are ICT specialists.

Other questions needed to be revised, based on the cognitive testing results. The main problems requiring revisions included:

- **precision of information:** Several questions asked for precise interval level information. Most respondents did not have this information readily available or would have had to consult their archives. The solution was to provide response categories that covered a range.
- **excessive information:** Questions with too much explanatory information often confused the respondents. These questions had to be simplified for better understanding.
- **lack of knowledge:** Several questions involved concepts or terms that were unfamiliar to the respondents. In some cases, including an explanation of the concept solved the problem, but in other questions the concept was too technical to be clearly explained. These questions were deleted, as with the ICT questions.
- **concepts involving broad definitions:** In this case, the problem was not a lack of knowledge but a lack of a focus, requiring further specification, clarification and examples.
- **concepts involving narrow definitions:** In contrast to previous item, the concepts were considered by the respondents to be too narrow or the wording was found to be too specific and limiting. The question was changed to allow for broader scope.
- **similar concepts and definitions:** Two or more questions covered different aspects of the same concept. The questions were either merged or one question was deleted.

- **inappropriate ranges:** The response categories included ranges which were either too high or too low in relation to the respondents' answers, requiring adjustment of ranges either downwards or upwards, to reflect common answers.
- **scope of ranges:** The response categories did not cover all possible options. The range categories were altered to cover from zero to 100% or different 'yes' categories were included.
- **ill-defined alternatives - lack of similarities within alternative:** The alternative response options did not cover related concepts or classes of individuals.
- **ill-defined alternatives - wording:** The response option were not clearly understood due to wording, requiring changes in the choice of words.
- **ill-defined alternatives - lack of details:** The response options were too broad, requiring further specification / details.
- **alternatives which did not lead to requested information:** The response options missed relevant information, requiring either further specification as above or splitting the question into two or more steps for better understanding, flow and richness of information.
- **"do not know" or "not applicable":** These options had to be added to several questions.
- **overlapping alternatives:** The response options had some degree of overlap, requiring correction for clear differentiation among alternatives.
- **missing alternatives, both at the establishment and at the sector levels:** Not all common alternatives / answers were included, requiring the addition of new ones. The additions were often relevant for specific types of establishments or sectors.

Examples of each of these factors, proposed changes, and final questions are given in Tables 5 and 6 for phase I and II of the employer questionnaire.

Other problems and changes introduced in the employer questionnaire covered the following items:

Wherever possible, the questionnaire uses the same response categories. For example, many of the questions include interval percentage response categories of 'none', 1% to 24%, 25% to 49%, etc. However, these differ if the event is known to be fairly infrequent, such as the share of female managers. In this case, the question provides response categories of 'none', '1% to 4%', '5% to 9%', '10% to 24%', and '25% or more'.

The structure of a series of questions on the use of different organisational methods has been standardised. Each question asks 1) if the method was used (yes or no), 2) if yes what percent of employees were affected, 3) if the method was used two years ago, (yes or no), 4) and if it had been used two years ago, had it since increased, decreased, or remained approximately the same. Box 1 gives an example of a question on the use of

quality circles.

Box 1 : Linked questions on quality circles

B1CIRCLE

Are any of the employees at this establishment currently involved in groups who meet regularly to think about improvements that could be made within this workplace?

1. Yes
2. No

B1CIRCLEPER [only ask if B1CIRCLE=1]

What percentage of employees at this establishment currently participates in such groups?

1. Up to 24%
2. 25% to 49%
3. 50% to 74%
4. 75% or more

B1CIRCLE2007

Did any of your employees participate in a group to think about improvements two years ago?

1. Yes
2. No

B1CIRCLECHG [only ask if B1CIRCLE2007=1]

Compared with two years ago, has the percentage of employees participating in such groups

1. Increased?
2. Decreased?
3. Remained approximately the same?

Many of the 'yes' responses were expanded. This is usually because the original question often contained two questions: for instance, did the establishment do x and did the establishment do x regularly. These types of questions have been changed to remove 'regularly' or 'continuously' in the main question. This information is now obtained in the response options.

The outsourcing/collaboration questions asked about the same set of activities six times (three times for current practices and three times for two years ago). This would be too repetitive for a CATI survey. The full set of activities is now only asked three times. Past activities are only asked in reference to any outsourcing or collaboration that is reported, as shown in Box 2.

Box 2: Structure of collaboration question

B4ACTV

Are each of the following activities carried out at this establishment?

[Provide separate 'yes' and 'no' response options to each of questions a to e]

- a. Design or development of new products or services
- b. Production of goods or services
- c. Procurement of inputs such as materials, parts, components, or services
- d. Sales or marketing of goods or services
- e. Administration

- 1. Yes
- 2. No

B4COLB [only ask if at least one of B4ACTV=1 and include each activity where B4ACTV=1]

Is this establishment currently collaborating with other establishments or organisations in carrying out each of the following activities [the following activity]?

[Provide separate 'yes' and 'no' response options to each of questions a to e]

- a. Design or development of new products or services
- b. Production of goods or services
- c. Procurement of inputs such as materials, parts, components, or services
- d. Sales or marketing of goods or services
- e. Administration

- 1. Yes
- 2. No

B4COLB2007 [only ask if AWPAGE>=2]

Did this establishment collaborate with other establishments or organisations on any of these activities [this activity] two years ago?

- 1. Yes
- 2. No

A question (see box 3) was added that asks if the establishment introduced an organisational innovation. We can not assume that our questions on different types of organisational or business practices are either understood as innovation or cover all possible types of organisational innovation.

Box 3: Question on any organisational innovation

EINNOVORG

During the last two years, has your establishment made significant organisational changes to your establishment ? This can include new or changed business practices, methods of organising work responsibilities and decision making, or methods of organising relations with other firms.

- 1. Yes
- 2. No

EBASKET

Could you please briefly describe the most important organisational change introduced by your establishment over the last 2 years?

(description).....

Record verbatim response
 (interviewer note: code NOC if no organisational change over the last two years)

Table 5. Phase I and II – Main Findings, Deletion or Substitution by new questions		
Original Question	Problem Specification	Solution
<p>B1CUSREL</p> <p>Who normally makes decisions about customer or client relations?</p> <ol style="list-style-type: none"> 1) The employee whose job involves direct dealings with customers 2) A senior manager or work supervisor 3) Both 	<p>Respondents stated that there were many different types of customer relations with different levels of staff playing a role.</p>	<p>Deleted</p>
<p>CHREDUCT</p> <p>Have you intentionally reduced the size of any parts of the workforce at this establishment over the past two years?</p> <ol style="list-style-type: none"> 1) Yes 2) No <p>If any reductions (CREDUCT=1):</p> <p>CREHOW</p> <p>How have these reductions been made? (check all that apply):</p> <ol style="list-style-type: none"> 1) Voluntary redundancies 2) Compulsory redundancies 3) Not filling posts that become vacant. 	<p>Respondents had problems with the word “intentionally”</p> <p>The interviewees did not find that the response categories accurately covered the options. In addition, they did not want to answer how reductions were made.</p>	<p>Deleted</p> <p>Information on employment declines and on their cause was making changes to two other questions (AEMPCH and AEMPCH-CAUSE).</p> <p>Deleted</p>

Table 5. Phase I and II – Main Findings, Deletion or Substitution by new questions		
Original Question	Problem Specification	Solution
<p>CGUARANT</p> <p>Is there a policy of guaranteed job security or no-compulsory redundancies for any groups of employees at this workplace?</p> <ol style="list-style-type: none"> 1) Yes 2) No 	<p>Respondents strongly believed that no job today is “guaranteed”. Moreover, the question probably would not provide useful results based on ‘any groups of employees’ (what if only 2% are covered by such an agreement?).</p>	<p>Deleted</p> <p>A question on temporary employment (ATEMP) is probably a better indicator for job insecurity.</p>
<p>CTRNOSO</p> <p>Does the everyday/normal work contain elements of organised skills development?</p> <ol style="list-style-type: none"> 1) Yes 2) No 	<p>No understanding of what the question meant.</p>	<p>Deleted</p>
<p>CSTAJOB</p> <p>Does this establishment use standardised job descriptions to administer the work of non-managerial employees?</p> <ol style="list-style-type: none"> 1) Yes 2) No 	<p>The purpose of this question was not clear. It would not be successful at getting at the idea of task flexibility. Considering that almost every employee has a job description, whether or not employees stick to it depends on many other factors that would need to be investigated.</p>	<p>Deleted</p>
<p>CMEETANY</p> <p>In the last two years, did your establishment hold meetings between senior managers and the whole workforce (either altogether or group by group)?</p> <ol style="list-style-type: none"> 1) Yes 2) No 	<p>A definition of the purpose of these meetings would be required. In its current form, the question is too general.</p>	<p>Deleted</p> <p>A more restricted question on meetings with supervisors produced more useful results.</p> <p>CBRFANY</p> <p>Do you have meetings between line managers or supervisors and all the workers for whom they are responsible? (interviewer note: If asked, these are sometimes known as ‘briefing groups’ or ‘team briefings’)</p> <ol style="list-style-type: none"> 1. Yes 2. No

Table 5. Phase I and II – Main Findings, Deletion or Substitution by new questions

Original Question	Problem Specification	Solution
<p>ICT questions Each question asks if a specific ICT technology is in use today and if it was in use 2 years ago. Only the 'today' version of each question is listed below'.</p> <p>B3 EXNET Does this establishment electronically share data with other organisations, such as other firms, your customers, suppliers, universities, etc.? Data can be shared through data interchange, either through an extranet or other specific external IT connection? 1) Yes 2) No</p> <p>B3COLLAB Does this establishment use collaborative work software or tools (such as groupware, videoconference...)? 1) Yes 2) No</p> <p>B3CUSTM Does this establishment use client or customer relationship software or tools? 1) Yes 2) No</p> <p>B3TRCK Does this establishment use performance tracking software or tools (sometimes known as a management control reporting system)? 1) Yes 2) No</p> <p>B3ERP Does this establishment use Enterprise Resource Planning (ERP) and/or workflow software? 1) Yes 2) No</p>	<p>Far too many respondents could not answer ICT questions, or they would try to answer but give an inaccurate response.</p> <p>Including a description of the technology did not help.</p> <p>Results would contain a high level of error.</p>	<p>Questions on ICT were deleted</p> <p>The only reliable method of using these questions is to send them to the establishment's ICT specialist. An example of a simpler version that could be sent to an ICT specialist is given at the end of the questionnaire: B3ITUSE.</p> <p>ICT MODULE ONLY ask if the ICT manager is interviewed</p> <p>B3ITUSE I would like to ask you about your establishment's use of five types of specialised information technology. If you are not familiar with each type of information technology, please answer 'don't know'.</p> <p>Does your establishment use each of the following types of information technology: a. Client or customer relationship software b. Performance tracking software c. Enterprise resource planning software d. Collaborative work software e. Electronic Data Interchange with external clients or suppliers</p> <p>Response options: Yes, No, Don't know</p> <p>B3ITUSE 2007 Were you using any of these five types of specialised information technology two years ago? 1. Yes 2. No 3. Don't know</p>

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Precision in information	Questions asking for precise information	Respondents do not have readily available. They would need to consult archives. Instead of precise information, alternatives can be more broadly defined.	AEMPCH From what you have told me, there are currently working at this establishment. How many people were working at this establishment two years ago, that is in [MONTH, YEAR]?	AEMPCH (RETESTED in phase 2) From what you have told me, there are currently working at this establishment. How does this number compare with the number of people who were working at this establishment two years ago, that is in [MONTH, YEAR]? (A) It has increased (B) It has decreased (C) Basically unchanged If response is A: Approximately by how much has employment increased? 1) By more than 10% 2) Between 11% and 25% 3) By more than 25% If response is B: Approximately by how much has employment decreased? 1) By less than 10% 2) Fell between 11% and 25% 3) Fell by more than 25%	AEMPCH Exclude temporary and agency workers. Question in two steps was easier for respondents.	How does the total number of employees at your establishment today compare with the number two years ago, that is in [MONTH, YEAR]? 1. The number of employees has decreased by over 5% 2. The number of employees has increased by over 5% 3. The number of employees is approximately the same.

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Precision						<p>AEMPCHa [only ask if AEMPCH = 2] Approximately how much has employment increased? 1. Increased from 5% to 9% 2. Increased by 10% to 24% 3. Increased by 25% or more</p> <p>AEMPCHb [only ask if AEMPCH = 1] Approximately how much has employment decreased? 1. Decreased by 5% to 9% 2. Decreased by 10% to 24% 3. Decreased by 25% or more</p>

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Precision					<p>Include new alternatives, related to technological innovation and decreases in budget.</p>	<p>AEMPCH-CAUSE If AEMPCH = 1 Were any of the following major reasons for the decline in employment ? [Provide separate “yes” or “no” reprise options to each of questions a to e]. a. Productivity increases due to technological innovation b. Productivity increases due to organisational changes or restructuring c. Decline in the market for your goods or services d. Sale or closure of part of your enterprise or organisation [only ask if APUB = 2] e. Budgetary cuts</p> <p>1. Yes 2. No</p>

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Precision						
Precision in numbers	Questions asking for precise numbers in terms of time, or any other quantifiable measures	Respondents have an approximate answer, but can not be precise <i>Use of ranges</i>	AWPAGE For how many years has this establishment been in operation? Please include time spent at other previous addresses.			If none of the above selected AEMPCDOOT Can you briefly describe the reason for the decline in employment? AWPAGE How many years has your establishment been in operation? Please include time spent at previous locations. 1. Less than 2 years 2. 1 to 4 years 3. 5 to 9 years 4. 10 to 19 years 5. 20 to 49 years 6. 50 years or more

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Precision						
Excess of information	Questions involving too much information , confusing respondents	Respondents reported overload / excess of information, leading to some confusion <i>Eliminate unnecessary information</i>	B1CIRCLE Are any of the employees at this establishment involved in groups who meet regularly to think about improvements that could be made within this workplace? 1) Yes 2) No	B1CIRCLE (RETESTED in phase II) Are any of the employees at this establishment currently involved in groups who meet regularly to think about improvements that could be made within this workplace? 1) Yes 2) No	Well understood	B1CIRCLE Are any of the employees at this establishment currently involved in groups who meet regularly to think about improvements that could be made within this workplace? 1. Yes 2. No

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Concepts Broad scope	Questions involving concepts with broad definition	Respondents reported lack of understanding of question scope, for example, what is actually included in the term “workforce”? Full-timers, part-timers, temporary workers? <i>More precise / detailed information about concept, including examples</i>	AEMP I now have some questions about the workforce at this establishment. Currently, how many employees do you have on the payroll at this establishment?	AEMP (RETEST in phase II) Currently, how many employees do you have on the payroll at this establishment? Include part-time, full-time, temporary, and permanent employees. 1. Less than 20 2. Between 20 and 49 3. Between 50 and 99 4. Between 100 and 249 5. Between 250 and 499 6. Between 500 and 1,000 7. More than 1,000	Some respondents claimed that temporary and agency workers were not part of regular payroll.	AEMP Currently, how many employees do you have on the payroll at this establishment? Include all employees directly paid by your establishment (i.e. part-time, full-time, permanent and temporary employees) 1. Up to 19 2. 20 to 49 3. 50 to 99 4. 100 to 249 5. 250 to 499 6. 500 to 999 7. 1,000 or more (Interviewer note: if asked, this excludes employees paid through an employment agency.)

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Concepts Need for further specification	Questions involving concepts that required some level of further specification to be understood	Respondents reported some level of vagueness, requiring some further explanation or change in wording <i>Further specification / definition / choice of words</i>	B4ACTV Are the following activities carried out by this establishment's own workforce (including temporary workers)? 1) Design or development of new products or services 2) Production of new goods or materials, supplies, or services 3) Purchasing of inputs such as materials, supplies, or services 4) Sales or marketing of goods and services Response categories: (yes, no)	B4ACTV (RETEST in phase II) Are the following activities carried out by employees at this establishment? 1) Design or development of new products or services 2) Production of new goods or services 3) Purchasing of inputs such as materials, supplies, or services 4) Sales or marketing of goods and services Response categories: (yes, no)	Alternative 3 was still unclear to a few respondents. <i>The word “input” required further specification.</i>	B4ACTV Are each of the following activities carried out at this establishment? [Provide separate yes and no reprise options to each of questions a to e] a. Design or development of new products or services b. Production of goods or services c. Procurement of inputs such as materials, parts, components, or services d. Sales or marketing of goods or services e. Administration Response options 1. Yes 2. No

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Concepts						
Narrow scope	Questions involving wording that is too specific, missing a broader picture	4) Sales or marketing of goods or services (yes/no) Respondents found questions/ concepts too specific <i>Change wording to allow for broader scope</i>	B2QUAL Does this establishment use numerical measures to monitor and evaluate the quality of your production processes or service delivery? 1) Yes 2) No	B2QUAL (RETEST in phase II) Does this establishment monitor and evaluate the quality of your production processes or service delivery? 1) Yes 2) No	For many respondents, the question was considered not relevant. <i>Need to specify further alternative responses.</i>	B2QUAL Does this establishment monitor the quality of its production processes or service delivery? 1. Yes, on a continuous basis 2. Yes, on an intermittent basis 3. No 4. Not relevant

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Concepts						
Similarity	Questions involving alternatives that are similar	Respondents were confused due to high similarity between alternatives <i>Merge similar alternatives</i>	ATYPE Which of the following best describe the main products or services produced in your establishment? (check one) 1) Products or services produced according to the customer's unique specifications			ATYPE Which of the following best describe the main products or services produced in your establishment? [respondent can choose one only] 1. Products or services that are customised to meet the customer's specifications 2. Standardised products or services

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
			2) Standard products or services with customer-specific options 3) Fully standardised products or services			
Use of ranges						
Inappropriate ranges – Too high	Questions with alternatives using ranges that do not reflect common answers – Too high	Ranges do not reflect what actually takes place in the establishments <i>Adjust ranges to reflect answers given by respondents. Ranges were adjusted downwards (lower ranges)</i>	AGNDRST And what percentage of the managers at this establishment is female? 1) None 2) Less than 25% 3) 25-49% 4) 50% or more			AGNDRM What percentage of the managers at this establishment is female? 1. None 2. 1% to 4% 3. 5% to 9% 4. 10% to 24% 5. 25% or more

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
			B1TEAM What percentage of the employees at this establishment works in teams where the members jointly decide how work is done? 1) None 2) Less than 25% 3) 25-49% 4) 50-74% 5) 75% or more			B1TEAM Are any of the employees at this establishment currently working in a team, where the members jointly decide how work is done? (Interviewer: if asked, a work team is sometimes called an autonomous team or a self-directed team) 1. Yes 2. No B1TEAMPER [ask only if B1TEAM = 1] What percentage of the employees at this establishment currently work in such teams? 1. Up to 24% 2. 25% to 49% 3. 50% to 74% 4. 75% or more
Use of ranges						
Inappropriate ranges – Too low	Questions with alternatives using ranges that do not reflect common answers – Too low	Ranges do not reflect what actually takes place in the establishment <i>Adjust ranges to reflect answers given by respondents. Ranges were adjusted upwards (higher ranges)</i>	B1TEAM What percentage of the employees at this establishment works in teams where the members jointly decide how work is done? 1) None 2) Less than 25% 3) 25-49% 4) 50-74% 5) 75% or more		Concept of team was not always clear. Further specification of what teams mean. Use of two questions instead of one to facilitate respondents	

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Use of ranges						
Scope of ranges	Questions for which ranges may cover from none to 100%	Proposed alternatives are limited to a certain range / do not cover both extremes (0% or none and 100%) <i>Replace by Yes or No</i>	B1DLGSCHD What percentage of non-managerial employees at your establishment can adapt the time at which they begin or finish their daily work, according to their personal requirements? 1) Less than 25% 2) 25-49% 3) 50% or more			B1DLGSCHD Can any of the non-managerial employees at this establishment choose when they begin or finish their daily work, according to their personal requirements? 1. Yes 2. No

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
ill-defined alternatives – Similarities	Questions involving ill-defined alternatives in terms of similarities	Alternatives do not group together similar concepts <i>Correct alternatives / categories to represent understanding of similar concepts</i>	AOCC What percentage of the workforce at this establishment belongs to each of the following occupational groups? 1) Managers, professionals and technicians. 2) Skilled clerical and sales workers 3) Skilled craft and trades workers 4) Unskilled workers	AOCC (RETEST in phase II) What percentage of the workforce at this establishment belongs to each of the following occupational groups? 1) Managers and professionals 2) Skilled technicians, skilled craft and trades workers 3) Skilled clerical and sales workers 4) Unskilled workers	Difficult to distinguish between professionals and skilled technicians. <i>Substitute “unskilled workers” by “low-skilled workers”.</i> <i>Managers as a separate alternative.</i>	AOCC Approximately what percentage of the workforce at this establishment belongs to each of the following occupational groups? 1. Managers 2. Professionals and skilled technicians 3. Skilled craft and trades workers 4. Skilled clerical and sales workers 5. Low-skilled and unskilled workers [CATI CHECK IF SUM OF 1+2+3+4+5 = 100%]

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
ill-defined alternatives – Wording	Questions involving ill-defined alternatives in terms of wording	Alternatives not clearly understood <i>Change wording to allow for better understanding</i>	ACUSTIMP To which of these groups does your establishment provide the largest volume of goods or services? 1) Other establishments within your enterprise [only if AINDP=2] 2) Other private sector enterprises 3) The government (public sector) 4) Individual members of the public	ACUSTIMP (RETEST in phase II) To which of those types of customer does your establishment provide the largest volume of goods or services? 1) Sister companies or other companies within your group 2) Private sector companies 3) Public sector: government agencies or government owned corporations 4) Individual consumers	Well understood	ACUSTIMP [only ask if more than one response given to ACUSTIM] To which of those types of customer does your establishment provide the largest volume of goods or services? [respondents can choose only one] 1- [only ask if AINDP=2] Sister companies or other companies within your group 2- Private sector companies 3- Public sector: government agencies or government owned corporations 4- Individual consumers

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
ill-defined alternatives- Lack of details	Questions which respondents did not find sufficient information to make an appropriate choice	<i>Add a third alternative to include the use of performance appraisal but as a support, indirectly.</i>	CAPPPRO Are decisions about employee promotion linked to the outcome of their performance appraisal? 1) Yes 2) No	CAPPPRO (RETEST in phase II) Are decisions about employee promotion linked to the outcome of their performance appraisal? 1) Yes, performance appraisal is the major factor that influences promotion of several factors that influences promotion 3) No	<i>Further improvements on Yes alternatives for better understanding / details</i>	CAPPPRO [only ask if CAPPP<1] Are decisions about employee promotion linked to the outcome of their performance appraisal? 1. Yes, the performance appraisal is the major factor that influences promotion 2. Yes, but the performance appraisal is one of several factors that influence promotion 3. No

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
Alternatives do not lead to requested information	Questions which alternatives do not lead to the information being requested	Alternatives are too broad / miss relevant information <i>Split the question in two levels to obtain information requested or Further specify alternatives, covering most common answers</i>	B3NETORD Does the establishment provide an online service via the Internet or another specific external IT connection? 1) Yes 2) No	B3NETORD (RETEST in phase II) Does this establishment have a website? 1) Yes 2) No (If yes) Does your website provide online services? These include the ability to order or purchase goods or services, make reservations, download application forms or other types of forms, etc? 1) Yes 2) No 3) Don't know	<i>Split question into two for more better flow and precise information</i>	B3WEB Does this establishment have a website? 1. Yes 2. No B3WEBSERV [Only ask if B3WEB = 1] Does your current website provide online services such as sales, ordering, reservations, downloads, etc? 1. Yes 2. No

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
			B2KMEX Does this establishment dedicate resources to continuously monitor external technological developments, or ideas for new or improved products, processes or services? 1) Yes 2) No			B2KMEX Does this establishment monitor external ideas or technological developments for new or improved products, processes or services? 1. Yes, with staff assigned specifically to this task 2. Yes, as part of the responsibilities of general staff 3. No

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
“Do not know” alternatives	Questions for which respondents do not have the answers	No alternatives to cover the fact that the respondent may not know the answer <i>Include alternative “I don’t know”</i>	CTRN OFFPC What proportion of employees has been given time off from their work duties to undertake training in the past 12 months? 1) Less than 25% 2) 25-49% 3) 50-74% 4) 75% or more			CTRN OFFPC [only ask if CTRNOFF=1] What proportion of employees has been given <u>paid</u> time off from their work to undertake training in the past 12 months? 1. Up to 24% 2. 25% to 49% 3. 50% to 74% 4. 75% or more

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
“Not relevant” alternatives	Questions which are not relevant for that establishment	No alternatives to cover the fact that the question may be not relevant to that particular establishment <i>Include alternative “Not relevant”</i>	B2JITP Does this establishment use a system designed to minimise inventories, supplies or work-in-progress. These are sometimes known as <u>just-in-time</u> or <u>lean</u> production systems or as working according to a <u>zero buffer</u> principle. 1) Yes 2) No			B2JITP Does this establishment use an automated system to minimise inventories, supplies, or work-in-progress. These are sometimes known as <u>just-in-time</u> or <u>lean</u> production systems or as working according to a <u>zero-buffer</u> principle. 1. Yes 2. No 3. Not relevant

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives Overlap- ping alter- natives	Questions involving alterna- tives / categories with some level of overlapping	Alternatives / categories with some level of overlap <i>Correct alternatives / categories to avoid overlapping.</i>	DMRKT Which of these geographical areas accounted for the largest share of your turnover between 2007 and 2009? 1) Local or regional 2) National 3) Inter-national			DMRKT [only ask if APUB=1 and if ACUSTM>1 (i.e. a private sector workplace that trades outside of its organisation)] Which of these geographical areas accounted for the largest share of your turnover between 2007 and 2009? 1. National 2. International

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives Missing alternatives – possible answers	Questions requiring more alterna- tives due to range of possible answers	Alternatives do not cover all possibilities <i>Include new alternatives</i>	B1DLGQLT Who normally makes decisions about quality control? Is it the employee undertaking the task or a senior manager or work supervisor, or would they make the decision together? (check all that apply) 1) The employee undertaking the tasks 2) A senior manager or work supervisor	B1DLGQLT (RETEST in phase II) Who makes decisions about quality control for goods or services? (Check all that apply) 1) The employee undertaking the tasks 2) A senior manager or work supervisor 3) Both together 4) Not relevant	<i>Include external stakeholders.</i> <i>Include “not relevant”.</i>	B1DLGQLT Are each of the following responsible for quality control? [Provide separate “yes or no” response options to each of questions a to e] a. The employee undertaking the tasks b. Managers or work supervisors c. Specialist group or division within the enterprise or organisation d. External groups – customers, external evaluation experts, etc. e. [only ask if responses a to d all “no”] Quality control not relevant to this establishment 1. Yes 2. No

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
Missing alternatives – establishment	Questions which respondents did not find appropriate alternative representing their establishment (situation)	Lack of appropriate alternatives <i>Include missing alternatives</i>	CBRIEFN How often do these meetings take place? 1) Every day 2) At least once a week 3) At least once a month 4) Less than once a month			CBRIEFN [only ask if CBRFANY=1] How often do these meetings take place? 1. Every day 2. At least once a week 3. At least once a month 4. At least once a year

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
Missing alternatives – sectors	Questions requiring more alternatives due to variety of sectors	Alternatives do not cover all possibilities <i>Include new alternatives</i>	DOPCHNG In the last two years, did your establishment need to make significant changes to your operations as a result of any of the following: 1) Changes in regulations for health and safety (yes/no) 2) Changes in environmental regulations (yes/no) 3) Other changes in law or regulations 4) Increased labour costs (yes/no) 5) Increased raw material or other input costs (yes/no) 6) Difficulties in securing finance (yes/no)	DOPCHNG (RETEST in phase II) In the last two years, did your establishment make significant changes to your operations , such as new expenditures, investment, or job tasks, to address any of the following: 1) Changes in regulations for health and safety (yes/no) 2) Changes in environmental regulations (yes/no) 3) Other changes in law or regulations 4) Increased labour costs (yes/no) 5) Increased raw material or other input costs (yes/no) 6) Difficulties in securing finance (yes/no)	<i>Suggested other alternatives, including:</i> <i>IT</i> <i>Demand</i> <i>Competition</i>	DOPCHNG In the last two years, did your establishment make significant new investments, changes in job tasks, or other major changes to your operations in response to each of the following factors: [Provide separate 'yes and no' response options to each questions a to h] a. Changes in health and safety regulations b. Changes in environmental regulations c. Increased labour costs d. Increased raw material or other input costs e. Increased competition f. Changes in demand

Table 6. Phase I and II – Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
			4) Increased raw material or other input costs (yes/no) 5) Difficulties in securing finance (yes/no)			g. Introduction of new technology (including ICT) [ask only if APUB = 2] h. Budgetary constraints 1. Yes 2. No

Employee Questionnaire

Phase I interviews

Interviews were conducted with employees occupying positions such as managers, administrators, coordinators, specialists, scientists, researchers, engineers, teachers, secretaries, clerks, receptionists, assistants, advisors, and consultants. The average length of the interviews was approximately 50 minutes.

The completed sample comprised 83 employees, of which 42 responded to questionnaire A and 41 to questionnaire B. The majority of the employees (76 out of 83) were in Europe, 4 in the United States and 3 of them had two or three different countries of origin as backgrounds. Table 7 summarises the employees' main characteristics in terms of the country of location.

Table 7. Country of ownership of employer's establishment
First round of employee interviews

Country	Number of interviews		
	Questionnaire A	Questionnaire B	Total
Denmark	5	5	10
France	4	3	7
Hungary	4	4	8
Germany	0	3	3
Italy	7	6	13
The Netherlands	8	6	14
Sweden	5	5	10
Ukraine	1	1	2
United Kingdom	4	5	9
United States	3	1	4
Mixed background	1	2	3
All countries	42	41	83

* Two or more countries of ownership of employer establishment due to mergers, partnerships, joint-ventures, etc.

The 83 interviews for Phase I were conducted mostly in the services sector (59/83), followed by the manufacturing sector (22/83). Almost half of the employees worked for large establishments with 250 or more employees (40/83). The majority of the workplaces were in the private sector (57/83), and were established before the year 2000 (67/83). For more detailed characteristics, please, refer to Table 2B.

Phase II interviews

Phase II interviews were conducted with employers occupying positions such as managers, administrators, civil servants, coordinators, researchers, accountants, dental hygienists, architects, graphic designers, engineers, agents, builders, workers, teachers, librarians, planners, clerks, receptionists, assistants, advisors, consultants, and waiters.

The completed sample comprised 46 individuals. Most of them were located in Europe (41 out of 46) and 4 in the United States (see Table 2A).

As with the first round, the majority of the employees interviewed for phase II were employed in the services sector (37/46), followed by the manufacturing sector (8/46) (See table 2B). Most worked for large and medium establishments. The majority of the establishments were from the private sector (30/46) and had been established before the year 2000 (29/46). For more details, refer to Table 2B.

Results for phases I and II

As for the employer interviews, the results for both sets of interviews are given together. The problems were similar but not identical to those found in the employer interviews. A common problem was with the response categories.

Employee – Summary of findings

There were three main problems with the employee questionnaire:

- **Poor precision:** The question was not clearly stated.
- **Unrealistic questions (scope too broad, concepts poorly defined, reluctance to reply etc):** These questions involved concepts or ideas that did not reflect what actually takes place in the work environment or the respondents were reluctant to answer. In these cases, the respondents found it difficult to identify themselves with the question. The solution involved re-wording to reflect actual conditions.
- **Inappropriate response categories:** The response options or ranges were not relevant to the respondents' experience. These problems were solved by adding new response options, changing wording, or changing the type of range, for example from a time reference in terms of days or weeks to the percent of time spent on different tasks.

Table 8 provides examples of the types of problems found in the employee questionnaire.

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions						
Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Precision in information involving numbers and time frame	Questions asking for precise information and numbers Time frame reference	Respondents needed further specification, before answering quantitative part. They have an approximate answer, but can not be precise <i>Split question into steps for better understanding</i> <i>Use of approximation and further specification</i>	DTRAINED (Ask all) Since <enter month two years ago/ or, if AJOBTENURE < 2 years, enter "you started working for <name of employer>, have you done any of these types of training or education connected with your current job? a) Received instruction or training from someone which took you away from your normal job b) Received instruction whilst performing your normal job c) Followed a correspondence or Internet course d) Taught yourself from a book, manual, video or computer e) Taken an evening class f) Done some other work-related training 1. Yes 2. No	DTRAINED (RETESTED in phase II) Since <enter month two years ago/ or, if AJOBTENURE < 2 years, enter "you started working for <name of employer>, have you taken any of the following types of training or education connected with your current job? Include both training paid for by your employer and training that you paid for yourself, as long as it was related to your work. a) Received instruction whilst performing your normal job b) Followed an instruction or training class outside of your normal job c) Followed a correspondence or Internet course d) Taught yourself from a book, manual, video or computer e) Taken any other type of work-related training 1. Yes 2. No	Further specification in terms of receiving instruction while working or away from work <i>Add alternatives for further specification</i>	DTRAINED (Ask all) Since <enter month two years ago/ or, if AJOBTENURE < 2 years, enter "you started working for <name of employer>, have you taken any of the following types of training or education in connection with your current job? Include both training and education paid for by your employer and paid for by yourself, as long as it was related to your work. a. Received instruction or training during work hours which took you away from your normal job b. Received instruction whilst performing your normal job c. Followed a correspondence or Internet course d. Taught yourself from a book, manual, video or computer e. Taken an evening class f. Done some other work-related training 1. Yes 2. No

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Précision			<p>DTRAINTIMEa [Ask if DTRAINIME=1] From <enter month two years ago/ or, if AJOBTENURE < 2 years, enter "when you started working for <name of employer>> till now, in total, how many weeks/days/hours did you spend in training? -- weeks 998 Don't know 999 Refused</p>	<p>DTRAINTIME [Ask if DTRAINEDa-DTRAINED=1] (TEST) Would it be best to describe the total time you spent in all of this training in terms of weeks, days or hours? 1. Weeks 2. Days 3. Hours 8. Don't know 9. Refused</p> <p>DTRAINTIMEa (RETEST) [ask if DTRAINIME = 1 or 2] From <enter month two years ago/ or, if AJOBTENURE < 2 years, enter "when you started working for <name of employer> till now, in total, how many weeks or days did you spend in all types of training and education related to your current job? -- weeks 8 Don't know 9 Refused</p>	<p>Most answers were related to weeks Use weeks as time reference Combine DTRAINTIME and DTRAINIMEa into one</p>	<p>DTRAINIME [Ask if at least one option to DTRAINED=1] Between <enter month two years ago/ or, if AJOBTENURE < 2 years, enter "when you started working for <name of employer>> and now, how much time did you spend in all types of training and education related to your current job? 1. Less than one week 2. Approximately one week 3. Approximately two weeks 4. Approximately three weeks 5. Approximately four weeks 6. Over four weeks</p>

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Concepts			<p>BWRKGROUP [Ask all] In performing your tasks, do you ever work together in a team or group of people? (Interviewer note: People could be within your organisation or from another organisation.) 1. Yes 2. No 8. Don't know 9. Refused</p>	<p>BWRKGROUP (RETESTED in phase II) In performing your tasks, do you ever work together in a permanent or temporary team that shares responsibilities and decisions? (Interviewer note: Team members can come from within the respondent's organisation or from another organisation – covered in next question.) 1. Yes 2. No 8. Don't know 9. Refused</p>	<p>Simplify question</p>	<p>BWRKGROUP [Ask all] In performing your tasks, do you ever work together in a permanent or temporary team? (Interviewer note: People could be from your firm [organisation] or from another firm [organisation].) 1. Yes 2. No</p>
Broad scope and / or need for further specification	<p>Questions involving concepts with broad definition</p>	<p>Respon-dents reported lack of understanding of question scope, for example, clarify the nature of "team or group of people" <i>More precise / detailed information about concept.</i></p>	<p>BWRKGROUP [Ask all] In performing your tasks, do you ever work together in a team or group of people? (Interviewer note: People could be within your organisation or from another organisation.) 1. Yes 2. No 8. Don't know 9. Refused</p>	<p>BWRKGROUP (RETESTED in phase II) In performing your tasks, do you ever work together in a permanent or temporary team that shares responsibilities and decisions? (Interviewer note: Team members can come from within the respondent's organisation or from another organisation – covered in next question.) 1. Yes 2. No 8. Don't know 9. Refused</p>	<p>Simplify question</p>	<p>BWRKGROUP [Ask all] In performing your tasks, do you ever work together in a permanent or temporary team? (Interviewer note: People could be from your firm [organisation] or from another firm [organisation].) 1. Yes 2. No</p>

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions						
Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Concepts						
Broad scope and / or need for further specification	Questions involving concepts that required some level of further	Respondents reported some level of vagueness, requiring further explanation or change in wording <i>Further specification / definition / choice of words</i>	BWRKGROUPEa [Ask if BWRKGROUPE=1] Thinking of this team, do the team members come: 1. Only from within your own organisation? 2. Only from other organisations? 3. From your organisation and other organisations? 8. Don't know 9. Refused	BWRKGROUPEa (ask if WRKGROUPE = 1) (RETESTED in phase II) Do the other members of your team come: 1. Only from within your own workplace? 2. Only from other workplaces, such as other firms or government agencies? 3. From your own workplace and from other firms or agencies? 4. Don't know 5. Refused	Specify further	BWRKGROUPEa (ask if BWRKGROUPE = 1) Where do the other members of your team come from? 1. Only from within your own firm [organisation]? 2. Only from other firms or organisations? 3. From both your firm [organisation] and other firms or organisations?

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions						
Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Concepts						
Concepts poorly defined or difficult to understand	Questions involving concepts that were poorly defined, leading to wrong interpretations	Respondents do not understand concept meaning <i>Re-define concepts with better choice of words</i> <i>Use of percentage ranges</i>	BWRKHARD [Ask all] How often does your job require you to work very hard? 1. Up to a quarter of the time 2. Up to half the time 3. More than half the time 4. All the time 8. Don't Know 9. Refused	BWRKHARD (RETESTED in phase II) How often is your job emotionally or mentally demanding? 1. Never or almost never 2. Less than 25% of the time (less than one quarter) 3. 25-50% of the time (one quarter to one half) 4. 50-75% of the time (one-half to three quarters) 5. More than 75% of the time (over three quarters) 8. Don't know 9. Refused	Difficult to grasp, most respondents considered emotionally demanding and mentally demanding two different concepts <i>Deleted</i>	BWRKHARD [Ask all] How often does your job require you to work very hard? 1. Up to a quarter of the time 2. Up to half the time 3. More than half the time 4. All the time 8. Don't Know 9. Refused
Concepts difficult to understand	Questions involving concepts that were difficult to understand	Wording "accessible" not understood. <i>Clarify wording</i>	ECHILDCARE [Ask all] Does your employer provide the following: a. Information about childcare provision and availability? b. Accessible childcare? c. Subsidised childcare? d. Other financial help with childcare? e. Help with childcare in school holidays? 1. Yes 2. No 8. Don't know 9. Refused	ECHILDCARE [Ask if HCAREa=1]. Does your employer provide any of the following: a. Information about childcare provision and availability? b. Childcare at your workplace? c. Subsidised childcare? d. Other help with childcare? 1. Yes 2. No		ECHILDCARE [Ask if HCAREa=1]. Does your employer provide any of the following: a. Information about childcare provision and availability? b. Childcare at your workplace? c. Subsidised childcare? d. Other help with childcare? 1. Yes 2. No

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Concepts						
Unrealistic	Idea does not reflect what actually takes place	Respondents can not identify themselves with the question <i>Re-wording to reflect actual conditions</i>	DPROBSOLVE [Ask all] In your work, are you ever confronted with complex problems that take at least 15 minutes to find a good solution? The 15 minutes only refers to the time needed to THINK of a solution, not the time needed to carry it out. 1) Yes 2) No 8. Don't know 9. Refused			DPROBSOLVE [Ask all] In your work, are you ever confronted with new or complex problems that take at least 30 minutes to find a good solution? Only consider the time needed to THINK of a solution, not the time needed to carry it out. 1. Yes 2. No

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Use of ranges						
Inappropriate type of ranges	Questions with alternatives expressed in terms of ranges	Alternatives difficult to visualise Difference between time working for a team and time actually spent with the team <i>Use of ranges instead.</i>	BWRKGROUPg [Ask if BWRKGROUP=1] How much of the time do you work together with this team? 1. Up to a quarter of the time 2. Up to half of the time 3. More than half the time 4. All the time 8. Don't know 9. Refused	BWRKGROUPg (ask if BWRKGROUP = 1) (RETESTED in phase II) How much of your time at work is spent working with a team? 1. Less than 25% of your time (less than one quarter) 2. 25-50% of your time (one quarter to one half) 3. 50-75% of your time (one-half to three quarters) 4. More than 75% of your time (over three quarters) 8. Don't know 9. Refused	Easier with percentages	BWRKGROUPg [ask if BWRKGROUP = 1] How much of your time at work is spent working with a team? (Interviewer, if they state '25%' or '50%', code to 2 and 3 respectively etc.) 1. Less than 25% of your time 2. 25% up to 50% of your time 3. 50% up to 75% of your time 4. 75% or more of your time

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Use of ranges						
Inappropriate ranges – Too high	Questions with alternatives using ranges that do not reflect common answers – Too high	Ranges do not reflect what actually takes place in the establishments <i>Adjust ranges to reflect answers given by respondents. Ranges were adjusted downwards (lower ranges) and type of response category</i>	DHELPPWORKER [Ask all] What proportion of the time does your job involve helping your co-workers to learn new things? 1. Up to a quarter of the time 2. Up to half the time 3. More than half the time 4. All the time 8. Don't know 9. Refused			DHELPPWORKER [Ask all] How often does your job involve helping your co-workers to learn new things? 1. Every day 2. At least once a week 3. At least once a month 4. Less often than once a month / never

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Use of ranges						
Scope of ranges	Inappropriate breakdown for ranges	Proposed alternatives do not reflect actual ranges <i>Change ranges to reflect respondents potential answers</i>	DWKEXPJOB [Ask all] If someone were hired or promoted to this job, how much related work experience would be required to get the job? Would it be less than a month, up to a year, up to 4 years or more than 4 years? 1. Less than a month 2. Up to a year 3. Up to 4 years 4. More than 4 years 8. Don't know 9. Refused			DWKEXPJOB [Ask all] If someone were hired or promoted to this job, how much related work experience would be required to get the job? 1. Less than a month 2. One month to one year 3. One year up to three years 4. Three years up to five years 5. Five years or more

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
ill-defined alternatives – Similarities	Questions involving ill-defined alternatives in terms of similarities	Alternatives are perceived as being similar Correct alternatives	BWFEFFORTa-b [Ask all] How often does your job involve: a. Working at very high speed? b. Working to tight deadlines? 1. Up to a quarter of the time 2. Up to half the time 3. More than half the time 4. All the time 8. Don't Know 9. Refused	BWFEFFORTa-b If nature of work is related to projects ask as follows: How often does your job involve working to tight deadlines? 1. Less than 25% of the time (less than one quarter) 2. 25-50% of the time (one quarter to one half) 3. 50-75% of the time (one-half to three quarters) 4. More than 75% of the time (over three quarters) 8. Don't know 9. Refused If nature of work is related to assembly line or production ask as follows: How often does your job involve working at high speed? 1. Less than 25% of the time (less than one quarter) 2. 25-50% of the time (one quarter to one half) 3. 50-75% of the time (one-half to three quarters) 4. More than 75% of the time (over three quarters)	Percentages are easier Merged questions BWFEFFORTa-b into one	BWFEFFORT [Ask all] How often does your job involve working to tight deadlines or at very high speed? 1. Less than 25% of the time 2. 25% up to 50% of the time 3. 50% up to 75% of the time 4. 75% or more of the time BCHGWEFFORT [Ask all] Thinking of your job <enter month two years ago/ or, if AJOBTENURE < 2 years, enter "when you started working for <name of employer">, how often did your job involve working to tight deadlines or at very high speed? 1. Less than 25% of the time 2. 25% up to 50% of the time 3. 50% up to 75% of the time 4. 75% or more of the time

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
ill-defined alternatives – Wording	Questions involving ill-defined alternatives in terms of wording	Alternatives not clearly understood Change wording to allow for better understanding	BTARGETSD [Ask if BTARGETSc = 1 or 2] When this occurs, what happens? 1. You stick to the quantity target 2. You stick to quality targets 3. You give up both quality and quantity equally	BTARGETSD (RETESTED in phase II) When you can't always meet your quantity and quality targets, what happens? 1. You stick to the quantity target 2. You stick to the quality target 3. One or both targets is revised	Simplify question Delete structure of BTARGETSd and substitute by BTARGETSc	BTARGETSc [Ask if BTARGETSa and BTARGETSb=1] Is it sometimes impossible to reach both the quality and quantity targets? 1. Frequently 2. Sometimes 3. Never
ill-defined alternatives - Lack of details	Questions which respondents did not find sufficient information to make an appropriate choice		BTASKREC [Ask all] Are the tasks you perform in your job recorded by a computerised system? 1. Yes, completely 2. Yes, partly 3. No 8. Don't Know 9. Refused	BTASKREC (RETESTED in phase II) Are any of the tasks you perform in your job regularly recorded on a computer? (Exclude simple recording of hours worked). 1. Yes, completely 2. Yes, partly 3. No 8. Don't Know 9. Refused	Further specification	BTASKREC [Ask all] Are the tasks that you perform in your job recorded by a computerised system? Exclude simple time keeping or the number of hours you work with word processing or other software programmes. 1. Yes, all tasks recorded 2. Yes, some tasks are recorded 3. No

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
"Not relevant" alternatives	Questions which are not relevant for that establishment	No alternatives to cover the fact that the question may be not relevant to that particular establishment <i>Include alternative "Not relevant"</i>	BTARGETS_a [Ask all] In your work, are you set targets related to quantity? For example, turnover, number of products or customers served. 1. Yes 2. No 8. Don't know 9. Refused	BTARGETS_a (RETESTED in phase II) In your work, are you set targets related to quantity? For example, sales, number of products or customers served. 1. Yes 2. No – but could be done 3. No - not possible for my job 8. Don't know 9. Refused	<i>Include "not relevant"</i> <i>Merge two negative alternatives into one</i>	BTARGETS_a [Ask all] In your work, do you set targets related to quantity? For example, for sales, the number of products produced, or the number of customers served. 1. Yes 2. No 3. Not relevant to my job

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
Missing alternatives – possible answers	Questions requiring more alternatives due to range of possible answers	Alternatives do not cover all possibilities <i>Include new alternatives</i>	ACONTRACT [Ask all] Is your job a permanent job or is there some way in which it is not permanent? 1. A permanent job 2. Not a permanent job (interviewer note: Do not read the following out) 8. Don't know 9. Refused ACONTRACT_a [Ask if ACONTRACT = 2] In what way is your job not permanent? Is it seasonal work, work done under contract for a fixed period, agency temping, or is it a casual type of work? 1. Seasonal work 2. Work done under contract for a fixed period 3. Agency temping 4. A casual type of work 8. Don't know 9. Refused	ACONTRACT (RETESTED in phase II) Is your job a permanent job or is there some way in which it is not permanent? 1. A permanent job 2. Not a permanent job (interviewer note: Do not read the following out) 8. Don't know 9. Refused ACONTRACT_a [Ask if ACONTRACT = 2] (RETESTED in phase II) In what way is your job not permanent? 1. Seasonal work 2. Work done under contract for a fixed time period. 3. Work for an agency that organises temporary employment 4. Casual work 8. Don't know 9. Refused	Difficult to interpret permanent and not permanent classification <i>Specify alternatives for better understanding</i> <i>Merge ACONTRACT with ACONTRACT_a</i>	ACONTRACT [Ask all] Which of the following best describes your job with [center name of employer>]? 1. Permanent job 2. Contract job with a fixed end date, even if several years in the future 3. Seasonal job 4. Casual job 5. Internship 6. Job through an agency that finds temporary employment

Table 8. Employee interview review results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
Missing alternatives – establishment	Questions which respondents did not find an appropriate alternative (missing alternative) representing their establishment (situation)	Lack of appropriate alternatives <i>Include missing alternatives</i>	DEDDOJOB [Ask all except if DEDGETJOB=1] Thinking of the skills gained from this level of education, is this level of education necessary to do this job satisfactorily or is a lower level sufficient? 1. This level is necessary 2. A lower level would be sufficient 8. Don't know 9. Refused	DEDDOJOB [Ask all except if DEDGETJOB=1] (RETESTED in phase II) Does this level of education provide the necessary skills to do this job? 1. Yes 2. No - A lower level of education would provide the necessary skills 3. No – More skills, either through training or experience, are necessary 8. Don't know 9. Refused	Still some level of confusion between two negative alternatives <i>Merge two negative alternatives for simplification</i>	DEDDOJOB [Ask all except if DEDGETJOB=1] Is this level of education necessary to acquire the skills to perform your job satisfactorily? 1. Yes 2. No, a lower level of education would be sufficient (Interviewer note: If says higher level necessary, code Yes).

Table 8. Employee interview review results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives						
Missing alternatives – sectors	Questions requiring more alternatives due to variety of sectors	Alternatives do not cover all possibilities Include new alternatives <i>Split into different questions to measure not only the existence of meetings but what is discussed and the effects of such discussions</i>	CMEETVIEWS [Ask if CMEETVIEWS=1] At these meetings can you express your views about: a. Planned changes in working methods? b. Planned changes in products or services? c. Health and safety issues? d. Training plans? e. The investment plans of the organisation? f. The financial position of the organisation? 1. Yes 2. No 8. Don't know 9. Refused	CMEETVIEWS [Ask all] (RETESTED in phase II) At your workplace, does management hold meetings in which you can express your views about what is happening in the organisation? 1. Yes 2. No 8. Don't know 9. Refused CMEETVIEWS [Ask if CMEETVIEWS = 1] (RETESTED in phase II) At these meetings, can you express your views about the following issues concerning your workplace: a. Planned changes how work is organised? b. Planned changes in products or services? c. Health and safety issues? d. Training plans? e. Investment plans? f. Financial position? g. Environmental impacts? 1. Yes 2. No 8. Don't know 9. Refused	Need for further specification Not always applicable for the establishment <i>Include the alternative "not applicable"</i> Further specification of a few alternatives	CMEETVIEWS [Ask all] At your workplace, does management hold meetings in which you can express your views about what is happening in the organisation? 1. Yes 2. No CMEETVIEWS [Ask if CMEETVIEWS=1] At these meetings, can you express your views about the following work issues: a. Planned changes in working methods b. Planned changes in products or services c. Health and safety issues d. Training plans e. The investment plans of your firm [organisation] f. The financial position of your firm [organisation] g. The environmental impacts of your firm [organisation] 1. Yes 2. No 3. Not applicable

Table 8. Employee interview results: Main findings, corrections, re-testing and final versions

Type of Problem	Problem Specification	Findings from Phase I / Proposed Solutions	Original Question	Version Retested in Phase II	Findings from Phase II / Proposed Solutions	Final Version
Alternatives				<p>CMEETIMPACT [Ask if CMEETVIEWS=1] (NEW QUESTION) Does expressing your views in such meetings have any effect on what is done? 1. Rarely 2. Sometimes 3. Frequently 8. Don't know 9. Refused</p>	<p>Only two answers, yes or no, difficult to measure in terms of frequency</p>	<p>CMEETIMPACT [Ask if CMEETVIEWS=1] Does expressing your views in such meetings ever have any effect on what is done? 1. Yes 2. No</p>
Reluctance to provide an answer	Questions asking for information which respondents felt uncomfortable to provide	Respondents felt sometimes uncomfortable to answer	<p>CJOBLIKE [Ask all] To what extent do you agree or disagree with the following for <enter name of employer>? a. I share many of the values of <enter name of employer>. b. I do not feel loyal to <enter name of employer>. c. I am proud to tell people who I work for. d. I am willing to work harder than I have to in order to help <enter name of employer> succeed. 1. Strongly agree 2. Agree 3. Disagree 4. Strongly disagree 8. Don't know 9. Refused</p>	<p>CJOBLIKE (RETESTED in phase II) To what extent do you agree or disagree with the following statements about working for <enter name of employer>? a. I share many of the goals of <enter name of employer>. b. I feel loyal to <enter name of employer>. c. I am proud to tell people of employer>. d. I am willing to work harder than I have to in order to help <enter name of employer> succeed 1. Strongly agree 2. Agree 3. Disagree 4. Strongly disagree 8. Don't know 9. Refused</p>	<p><i>Change goals to values</i> Continue level of scepticism about the question</p>	<p>CJOBLIKE [Ask all] To what extent do you agree or disagree with the following statements about working for <enter name of employer>? a. I share many of the values of <enter name of employer>. b. I do not feel loyal to <enter name of employer>. c. I am proud to tell people who I work for. d. I am willing to work harder than I have to in order to help <enter name of employer> succeed. 1. Strongly agree 2. Agree 3. Disagree 4. Strongly disagree</p>

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