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From Structure Follows Strategy to Process Follows Proposition

Strikwerda, J.

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Organization Design in the 21st Century: From *Structure follows Strategy* to *Process follows Proposition*

Prof. Dr. J. Strikwerda CMC¹

Universiteit van Amsterdam – Amsterdam Business School
Plantage Muidergracht 12
Room 0.26
1018 TV Amsterdam – Netherlands

Nolan Norton Institute
Driebergse weg 17
3700 CC Zeist - Netherlands

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Abstract

Organization design is the discipline within the field of organization theory and management theory aimed at creating efficient organizations of firms. In the twentieth century organization design, at least at the governance level of organization, used to be merely a choice between a limited number of alternative organization forms. Due to a number of developments the scope, the design variables and design criteria need to be reconsidered. Especially Chandler's design rule 'structure follows strategy' is to be questioned and seems to be replaced by 'processes follow proposition' (the customer value proposition). The focus in the twentieth century on structure as the parameter of design, which was replaced by processes in the nineties, now according to Herbert Simon appears to be replaced by the design of the information space of the firm and the design of the objective function of the firm and those within its organization, due to the declining costs of information and communication. The design of the objective function also answers the issue that firms need to adapt their internal organization in view of the weakening of the institutions in society, on which in the twentieth century a number of processes within the internal organization were based. Due to the emergence of new business models and new type of customer value propositions, a more precise design of especially processes is needed in which structure as configuration plays a secondary role. Because the 21st century firm needs a high capacity of data processing and information in the modern firm is a resource to be exploited, new conditions are needed to facilitate workers to turn data into new revenue streams. This requires an approach to organization design which includes management accounting and information management, as well specific elements of organizational behavior.

This paper provides an overview of changes in the field of organization design and its institutional context, based on existing publications and laying the groundwork for a new multidisciplinary integrative approach for organization design as induced by the changing nature of the firm.

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1 Introduction

1.1 Organization design matters

There is a ceaseless broad stream of publications on (new) organization forms of firms, varying from high abstract academic discourses, via practical manuals to apodictic pamphlets. Some advocate specific new organization forms, others not so much new organization forms but emphasize aspects like leadership, intrapreneurship, team work, culture, etc. Some question the use of (forma) organization in sometimes extreme cynical expressions.

It seems to be legitimate to raise the question: does the organization of the firm matter? Is organization a necessary cost or is it an asset of the firm? When the Dutch based multinational company Philips Electronics in the early nineties of the twentieth century changed its cost accounting system to adapt it to the changing nature of its assets and technology, it introduced the cost category *costs of organization* to calculate income (EBITDA). In doing so it was suggested that these costs of organization needed to be minimized to maximize income. This is in stark contrast with the results of research on the role of intangible assets with respect to the growth of labor productivity, return on investments in ICT and the value of the firm (Brynjolfsson, Hitt, & Yang 2002a; Brynjolfsson, Hitt, & Yang 2002b; Powell & Dent-Micallef 1997; van Ark & Jäger 2010; van Rooijen-Horsten, van den Bergen, & Tanriseven 2008). Although research into the role of intangible assets perhaps still is in its infancy, so much can be concluded that the complementarities and co-specialization of human capital, organization capital and information capital does play a material role in the value of the firm; the organization of the firm is, if well designed and operating, is not a cost but an asset. Even so much that in national statistics investments in human capital, organization capital and information capital are measured as a percentage of GDP because it turns out that in developed countries higher investments in

intangible assets compared to investments in tangible assets significantly contribute to a higher growth in labor productivity (Brynjolfsson & Saunders 2010; van Ark, Hao, & Hulten 2009).

The accounting rules (IASB-IAS 38) do not allow investments in human capital, organization capital nor information capital (except investments in IT hardware en software), to be capitalized. Despite this accounting rule especially the USA for the last thirty years has shown higher investments in intangible assets as compared to investments in tangible assets. These higher investments in intangible assets correlate significantly with a higher growth of labor productivity compared to Europe (van Ark, Hao, & Hulten 2009). The fact that investments in the three forms of intangible assets need to be expensed and therefore are detrimental to the profit in the short term apparently does not derange managers from the insight and experience of the value of investing in intangible assets, despite the emphasis on shareholder value and related to that a focus on short term profits. Which raises the question in which cases time and money spent on organization development is a waste of money, and in which cases it will be an investment, producing future returns.

The issue of organization design traditionally was aimed on creating a most efficient organization in terms of operational costs. Now the question is raised in which way investments in organization capital, together with those in human capital and information capital, will produce the most value for the firm. That is, the aim of designing organization is to create an efficient organization, but now the focus is on efficiency in welfare economic terms. This provides a new perspective to the issue of organization design.

The issue of organization capital is not addressed in studies like Burton *et al. Designing Organizations: 21st Century Approaches* neither in e.g. Bøllingtoft *et al. New approaches to organization design : theory and practice of adaptive enterprises* nor in Roberts' *The Modern Firm: Organizational Design for Performance and Growth* (Bøllingtoft, Håkonsson, Nielsen, Snow, & Ulhøi 2009; Burton, Eriksen, Håkonsson, Knudsen, & Snow 2008; Roberts 2004). The idea of organization capital is part of the practitioner's concept of the strategy map, together with human capital and

information capital (Kaplan & Norton 2004). However, the strategy map is usually perceived to be a tool for management control, and is not seen as an element in organization design.

The twentieth century was an organizational society (Presthus 1962) with individuals groomed to live and work in those organizations as depicted in Whyte's *The Organization Man*. One of the chief founders of the school of English neoclassical economists, Alfred Marshall labeled organization as the fourth production factor, after capital, labor and land (Best 2001:63). The OECD assumes that to explain the growth of welfare since 1900 technology is the first explanatory factor, organization and management the second factor.

In Coase his famous paper *The Nature of the Firm* (1937) he asked the question *why do firms exist?* His answer was because firms manage to coordinate their activities in the market and their internal activities more efficiently as does the market. The decline of transaction costs due to the vanishing costs of information and communication (De Kuiper 2009) and thus a higher efficiency of markets, made some predict that (large) firms would dissolve and more transactions would be conducted through the market mechanism, making the (internal) organization of the firm less important. A higher efficiency of markets after the Second World War forced especially manufacturing firms to deverticalize and to outsource a number of business processes, suggesting that the internal organization is less a factor of importance in the 21st century compared to the 20th century. In the financial industry, through mergers and acquisitions, firms have grown in size, also in terms of numbers of employees. At the same time investors, through the various systems of corporate governance, have set new requirements to the (efficiency of the) organization of the firm, as do regulators, especially in the financial industry. The question of how to organize has not disappeared from the agenda of boards, but organization has become a different phenomenon and will change by nature for the time coming. At the same time the nature of the firm is changing (§ 7.1). The question to be asked and to be answered is what the

changing nature of the firm and its organization implies for designing organization, by issues and by process.

Deciding a new organization form or organization structure used to be seen as an issue of change, of choosing between known alternative forms. To design an organization is subject for research for quite some time, still leaving a number of questions unanswered. Due to the innovation of business models there is a new wave of interest for design rules for the organization of the firm. The question is whether such design rules can be identified. It seems to be that in order to identify new design rules, we need to step out of the present paradigms, both in practice and in academia, with respect to organization. A procession of authors has written on organization design, (Baldwin & Clark 2002a; Brickley, Smith, & Zimmerman 2001; Burton & Obel 2004; Daft 1998; Denyer, Tranfield, & van Aken 2008; Drucker 1973; Dunbar & Starbuck 2006; Ethiraj & Levinthal 2004a; Galbraith 1973; Galbraith 2002; Galbraith 2005; Galbraith 2009; Goold & Campbell 2002; Hammer & Champy 1993; Harris & Raviv 2000; Jensen 1998; Keen 1991; Kogut & Bowman 1995; Lawrence & Lorsch 1969; Martin ; Morabito, Sack, & Bhate 1999; Nadler & Trushman 1997; Ouchi 1979; Puranam, Goetting, & Knudsen 2010; Roberts 2004; Sadler 1998; Sarasvathy, Dew, Read, & Wiltbank 2008; Siggelkow & Rivkin 2005; Simon 1962; Simon 1996; Simons 2005; Slywotzky & Morrison 1997; Stanford 2007; Visscher & Visscher-Voerman 2010), to mention only the most important authors. Despite all these academic efforts no satisfactory theory, philosophy or design rules seem to exist how to design an efficient organization of a firm, capable to adapt to new situations.

Did we ever design organizations? Meyer (1994) suggested: "There is only a loose relationship between organizational forms and practical needs and goals operating in local situations. In this sense Western organizational structures are to be seen as ritual enactments of broad-based cultural prescriptions rather than the rational responses to concrete problems that

the cultural theories purport them to be.“ Grandori (Grandori 1997; Grandori & Soda 2006) suggests that design is intended as a process of choice between known discrete organization ‘forms’, M-form, U-form, H-form, T-form, A-form, J-form, N-form, rather than as a process of the search for organization forms devised ad hoc to solve specific problems. DiMaggio & Powell suggest that for a long period design was of a mimetic nature. To be judged by the performance of western economies in the 20th century, especially the growth of welfare, this choice process perhaps was not the most ideal, but obviously it neither has impaired economic development.

This lamentation on the lack of concepts and methods for organization design applies to the governance level of the organization, not at the level of operational processes. The latter always have been subject of design based on the field of industrial engineering to achieve growth in labor productivity, improved quality of products, logistics, etc. In addition to the concepts of industrial engineering a number of social aspects relevant for operational processes were addressed by e.g. the socio-technical concept, organizational behavior and organization development. Industrial engineering, the socio-technical concept and organization development were applied within the context of a limited number of standard organization forms. The most frequently applied organization form is the M-form or unit-organization.

Since about 1990 there are complaints about the traditional organization forms, often qualified as silo-organizations (Aaker 2008) in which it is difficult to cooperate and to coordinate across departments, to achieve synergies etc. The concept of process management seems to be an attempt to achieve this cross-departmental cooperation and synergies, but apparently with limitations. Also behavioral science based interventions, e.g. culture programs, have a mixed reputation to solve the limitations of traditional organization forms. As we will see the solution sought after by process management for the better part is an issue of management accounting and the organization of information to create conditions for efficient teamwork.

As we will see it are the assumptions underlying such organization forms like the M-form and the H-form, which no longer fit the economics of the new business models of the 21st

century, especially the economics implied by the shift to the role of intangible assets. But organization forms not only are economic constructs, they are as much social constructs with identities and role and also mental models from which managers see the world and define issues. Many attempt to solve the issues in their firms induced by the unit-organization within the concept of the unit-organization, which results in suboptimal solutions.

The observation that organization design, at least at the level of organization forms, mainly was choice or mimetic behavior raises a number of questions. Might it be that in the quest for a theory on organization design the concept of organization as used in academic theory differs from that used in the theory-in-use of executives, managers and consultants? Or might it be that the choice of organization form is not critical for the performance or survival of the firm? When Chandler (1962:382-3) concludes: “Structure follows strategy ... but the market is the common denominator” he suggests as design criteria *fit-to-strategy* and *fit-to-market*. However, the publications on organization design in the twentieth century do not seem to place much weight on Chandler’s criteria of fit but much more on the economics of production, emphasizing efficiency in production over fit-to-market.

Or might it be that academics employ a concept of organization which leaves out factors that are (more) critical for the performance and survival of firms compared to those considered? Four examples may illustrate the variety in thinking on organization design in academia, the models published by Galbraith, Daft, Simons and Slywotzky & Morris.

Galbraith’s Star Model defines as design parameters: *strategy* (direction), *structure* (specialization, shape, distribution of power, departmentalization), *processes* (information), *rewards* (motivation), *people* (skills and mind-sets) (Galbraith 2002). Daft (1998) defines interacting contextual and structural dimensions of organizational design, being: goals and strategy, size, technology, environment, culture, structure (formalization, specialization, standardization, hierarchy of authority, complexity, centralization, professionalism, personnel ratios).

Simons (2005) defines organization (re)design as necessary to achieve meta-control for the firm. To be in-control requires amongst others adaptability of the organization to its environment. Simons defines his four C's of organization design:

1. Customer definition (unit structure);
2. Critical performance variables (diagnostic control systems);
3. Creative tension (interactive networks);
4. Commitment to others (shared responsibilities).

In doing so Simons broadens the scope of organization design in at least two ways. To the familiar elements of structure and teamwork Simons adds the dimensions of management control/accounting and the element of reward systems (Simons fourth C). The second addition is that Simons defines the organization from the perspective of control, in which in-control implies the adaptability of the organization to changes in its environment. Simons however limits this to operational changes, e.g. at the level of workers in a call center. But his point of viewing the organization from a perspective of meta-control can be extended to a wider range of environmental changes, especially institutional changes.

Slywotzky & Morrison place the issue of organization design within the context of business design (§ 7.4) (Slywotzky & Morrison 1997). Although perhaps more practitioners as a typical academics Slywotzky & Morrison define a number of design questions with respect to the business design of a firm, amongst others the choice of the profit model. In doing so Slywotzky & Morrison remind us that the internal organization of a firm, about which authors on organization design typically are writing, is not an object of design in itself. The internal organization is part of a larger system, the firm and its business, in which it fulfills a particular function or multiple functions. Slywotzky & Morrison suggest that the design of the business of the firm precedes the design of the organization of the firm. If form follows function (Lidwell,

Holden, & Butler 2003:90) the question should be asked what function(s) the internal organization of the firm is supposed to fulfill?

1.2 The objectives of organization design

What is to be achieved by designing the organization of the firm? In the neo-classical economy the firm is considered as a black-box production function, as a result of which the efficiency of the firm is defined as efficiency of outcomes or allocation efficiency. The object of organization design is to design the inner working of this black box. The efficiency of the organization is to be judged by the relation of its outcomes to its inputs.

Brickly *et al.* propose as a first way to judge the efficiency of the organization to make a outcome by outcome comparison (Brickley, Smith, & Zimmerman 2001:24): “Consider two contracts, routines, decision processes, organizations or economic systems, say X and Y, which both might be used in a variety of circumstances. Suppose that, in each such circumstance, Y always yields outcomes that are viewed by all the people involved as being at least as good as those that X produces, and that sometimes Y yields results that at least one person definitely prefers to the outcome under X. In this case X is inefficient because Y does better.”

This definition of organization efficiency has a number of problems. First is that Brickly *et al.* speak of multiple outcomes, not of a single outcome. Indeed a firm not only produces products, services, or dividends for its shareholders, a firm also produces new knowledge, provides incomes, social status, social roles, maintains discipline in society etc. The issue is how to measure and how to judge this outcome.

A second problem is that it may be difficult to find for a specific organization a comparable other. This has been done the last twenty years through benchmarking, which certainly has produced improvements, but is not without problems. The method of comparison

may not necessarily reveal, e.g. due to a herd mentality in an industry or a function, that a more efficient method for e.g. manufacturing can be engineered.

A third problem with the definition of Brickly *et al.* is that it implies subjectivity. Who is this one person in their definition? Is it the shareholder, the management or are it workers? The definition suggest this person to have a decision right, else his opinion is of little use to force the organization to be more efficient by making a choice for a more efficient organization.

A fourth problem is that outcomes most likely will include the going concern value of the firm. To do a comparative test in a variety of circumstances not only will be *hic et nunc*, but also over a longer period of time. This implies that adaptability (*change*) of the organization also is a criterion for design (Lawler & Worley 2006). That in its turn brings to organization design the issue of to be *in-control*. For a firm to survive over a longer period in changing circumstances requires *control* in the sense of the ability to acquire and process (interpret) external and internal information in such a way that this generates those actions (investments, disinvestments) as needed to survive in changing circumstances. This makes information an essential part of the design of an organization.

Because the organization of a firm is many things to multiple stakeholders, defining, designing and agreeing the objective to be achieved by organization design itself is an issue of design. For a certain period it has been pursued to solve this problem by defining the shareholder value of the firm to be as well the objective of organization design. This approach however needs to be questioned. The value of the firm is an example of ontic plurality: shareholder value is just an alternative to the going concern value of the firm, the value created by the firm and stakeholder value. Due to the role of tacit knowledge as embodied by human capital, the value of the firm no longer equals shareholder value.

So preceding the question what the objectives are of organization design is the design of the objectives of the firm. In general this objective will not be one-dimensional financial, but it may include altruistic values, whether profit is the primary objective or whether it is seen to

result from activities, but e.g. answering the requirement of costs of capital. Given the objective function of the firm, which in general will be multi-objective and multi-criteria, the objective of designing the organization of the firm is to create and maintain an efficient organization in the longer term, which will therefore include the capability of adaptability and transformation: systemic efficiency.

1.3 Context and organization design

The leading criterion for organization design is systemic efficiency, that is that an as high as possible set of outcomes is produced with an as small as possible set of inputs over the life time of the organization (most firms exist only for thirty to forty years). The outcomes should include externalities, e.g. deteriorating effects on the environment (to be weighted negatively in the outcomes), knowledge spill over to other firms, the way paid work is appreciated in society, etc.

As organization forms are about the internal organization of a firm, in general the design of the firm will precede the design of organization form. But as organizations also are containers of capabilities, it cannot be excluded that in specific cases this relation is reversed. If the design of the firm precedes the design of organization, what are defining design parameters of the firm? As the entrepreneurial firm is shaped by specific institutions in our societies, corporate law, property law, labor law, industrial relations, contract law, etc., might it be that changes in such institutions will induce new organization forms? The emergence of new business models, in some of which e.g. the title flow, contrary to the past, is a design variable (Tapscott, Ticoll, & Lowy 2000), as is ownership in open innovation (Chesbrough, Vanhaverbeke, & West 2006) suggests that the scope of organization design needs to be reconsidered beyond the legal boundaries of the firm.

A business model is defined as “a conceptual tool that contains a set of elements and their relationships and allows expressing a company’s logic of earning money. It is a description

of the value a company offers to one or several segments of customers and the architecture of the firm ...” (Osterwalder 2004:15). When we add to this the ongoing shift from budget-driven strategy execution (typical for the M-form) towards strategy execution based on validated cause-and-effect relations (Kaplan & Norton 2008), does this imply that in the 21st century organization design, apart from being perhaps different from that in the 20th century, will be more critical for the success of the firm? The growing emphasis of innovating business models and translating these first into delivery processes, rather than structures, suggest an important change in the method of organization design.

An even more radical change in the object of organization design seems to be implied by Herbert Simon when he writes: “The major problems of [...] organization [design] today are not problems of departmentalization and coordination of operating units. Instead they are problems of organizing information storage, and information processing - not problems of the division of labor, but problems of the factorization of decision-making” (Simon 1945/1997:307). That is to say organization design is about the organization of information and the design of the objective function.

1.4 Questions addressed in this paper

To many organization design is a wicked problem, difficult to define by scope, by process, by those to be involved, by the judgment of its outcomes. This perceived wicked nature of the problem to an extent is the result of lack of an analytical approach to the phenomenon of organization. As introduced in this chapter, seven main questions will be discussed in this book:

1. What is ‘organization’ in organization design? (§ 2)
2. What is ‘design’ in organization design? (§ 3)
3. What are dimensions of organization design? (§ 5)

4. What are or may be implications of the changing nature of the firm for organization design? (§ 7)
5. What are criteria to be answered by a design (§ 9)
6. Is it possible to describe a generic model of the 21st century organization forms? (§ 9)
7. What will be core questions and heuristics for organization design in the 21st century? (§ 10)

In addition to these seven main questions a number of additional issues will be dealt with. Some question whether, due to their nature, organizations can be designed at all. Let it be that a design of an organization could be turned into reality. Like in general Eisenhower's quote "plans are nothing, planning is indispensable", designing an organization is as much a mental exercise in understanding an organization, as it is about creating an organization. Therefore the nature of organizations in relation to its design is discussed in § 4. Like the market mechanism depends on the institutions of society, so does the firm and therefore its organization. The relation between the institutional environment and organization design is discussed in § 6 as a context for § 7, the changing nature of the firm. The ground needed to answer the questions asked in § 10, is laid in § 8 with respect to the role of psychology, information and process in organization design and in § 9 with respect to sources of design parameters.

Especially the fourth question (§ 7) for many perhaps will be speculative if not grotesque. But the very act of designing is to create something that does not exist yet, but is aimed at for some ambitious reason. Although induction and deduction may be usefully applied in design processes, design as much is based on abduction: what else might also be possible and useful? Design is a creative act, not ignoring physical and other laws, but putting them to new use.

2 What is 'organization' in organization design?

2.1 Organization versus firm

In our society the concept of 'organization' carries multiple meanings, images and usages. Within academic studies multiple definitions of 'organization' exists, as do in society. Whoever wants either to define organization design principles or wants to study how organizations are being designed and redesigned, needs to make explicit what concept of organization is being assumed in his or her study, be it design or explanation. Most authors on organization design implicitly write on the internal organization of the firm or an institution. This is because for a long period the relation between the business model of the firm and its internal organization used to be weak. Due to the separation of capital and labor, the legal organization was designed from the perspective of the firm as a nexus of contracts between its shareholders. The franchise organization, like e.g. McDonalds, is an example in which ownership and the franchise contract is a design variable. In the era of the vertical integrated firm, the firm could be identified by its organization in terms of products, activities and workers. Deverticalization, business process outsourcing, alliances etc. in combination of the increased role of corporate governance systems, emphasize the difference between the firm and its (internal and external) organization. Legally the organization of a firm is organized based on the corporation, the legal persona, in which the firm is incorporated. To understand the nature of the internal organization, especially its function and traditional delimitation, it will therefore be necessary to understand the context of the internal organization, this is the firm.

2.2 What is a firm?

Despite its role in society and its ubiquitous nature, no clear definition of the firm (or enterprise) exists, neither in economic publications nor in the field of business administration. Multiple discussions of the nature of the firm exist. Probably the first formal description of the firm is to be found with Coase (1937). Coase explained the firm as an element in the economic system, which exists due to transaction costs in the market respectively market imperfection. Coase did not explain the inner working of the firm.

For organization design appears to be relevant Baumol's distinction between redistributive entrepreneurship (redistributive enterprises) and productive entrepreneurship (productive enterprises) (Landes, Mokyr, & Baumol 2010:x). This distinction is relevant for the design of the objective function as an element in organization design.

Redistributive entrepreneurship is about e.g. aggressive warfare, arcey, rent-seeking litigation and such; activities that may produce wealth for the entrepreneur, but which does not create value for society.

Productive entrepreneurship is about creating value, increasing the size of the pie of the national welfare. Productive entrepreneurship and thus such firms create value that is distributed between consumers, as the consumer surplus, en the entrepreneur, or shareholders, as the producer surplus. Productive entrepreneurship and thus such firms are distinguished into replicative entrepreneurship en innovative entrepreneurship. Organization design most likely is an issue for the latter, organization engineering for the first. Having made this distinction, we need to turn to what actually a firm is in society. Edith Penrose defined:

“A firm is more than an administrative unit; it is also a collection of productive resources the disposal of which between different users and over time is determined by administrative decision. When we regard the function of the private business firm from this point of view, the size of the firm is best gauged by some measure of the productive resources it employs” (Penrose 2009). With this Edith Penrose is considered to be the founder of the resource based

view of the firm. The dynamic capabilities approach of the firm, whose roots go back to Joseph Schumpeter, and later to be elaborated in the core competence approach (Hamel & Prahalad 1994), all have their roots in Penrose' writings. In the resource view the configuration of resources in relation to demand from the market is a central issue in organization design, as is the recombination and development of resources in the dynamics capabilities approach. Due to deverticalization and outsourcing, the resource based view tends to be replaced by the knowledge based view of the firm, making the architecture of the value proposition (Takeishi & Fujimoto 2003) and the design and management of contracts a more important object of design (Quinn 1992).

Rajan and Zingales (Rajan & Zingales 1998; Zingales 1998) define the firm as a nexus of specific investments, a combination of mutually specialized assets and people. This definition is typical a definition from the perspective of corporate finance, which prefers to see the large firm as a portfolio of self-contained investment projects. Roberts (2004:34) defines as a characteristic of the firm complementarity of production factors, whereas in the traditional production function the emphasis is on substitution of production factors, e.g. labor and capital.

Two inputs in the production function of the firm are complements when doing (more) of one of them increases the returns to doing (more of) the other. This is especially an issue in knowledge exploitation, but also in investments in information technology which only will be productive when complemented by appropriate investments in organization capital and in human capital (Brynjolfsson & Hitt 2003; Brynjolfsson, Hitt, & Yang 2002b; Brynjolfsson & Saunders 2010). In terms of organization design these complementarities imply that designing for synergies and parenting value is a core element in the design of the organization of the modern firm.

An issue with the concept of the firm, especially as defined in industrial organization, the firm as a nexus of contracts (Brickley, Smith, & Zimmerman 2001:241), is that so defined the firm is an amalgamation of the concept of the corporation (as a legal concept) and the concept

of the enterprise. We will see that both are related but separate design issues; an enterprise is incorporated in a corporation or a group of corporations (a concern). Others define as characteristics of the entrepreneurial firm own initiative, perceived but uncertain market opportunities and the ability to absorb uninsurable risks (according to the founder of the Chicago School of economists, Frank H. Knight, 1885-1972).

On basis of the foregoing we will define the firm or enterprise for the time being as: a specific combination of mutually specialized tangible and intangible assets, these assets, except for personal knowledge of its management and employees, being owned by the corporation in which the firm is organized, which through creating products and providing services creates value for society, is based on own initiative, and on a perceived market opportunity, requiring investments, and its activities being coordinated by non-price mechanisms and which is run on basis of the objective to create wealth increase for its owners or investors.

This definition of the firm leaves out state enterprises, non-profit organizations, as well as criminal organizations. Such institutions have design issues of their own, which are outside the scope of this paper.

The discussion of e.g. Michael Jensen on the theory of the firm (Jensen 2000a:83-91) focuses on the boundaries of the firm, whether a firm is vertically integrated or not, the agency costs with respect to the firm and on the contractual relations being the essence of the firm, the firm as a *nexus of contract*. However, these are external characteristics of the firm, the creation of value by resource allocation and resource interaction in the case of creative knowledge, take place within a social system created by this nexus of contracts, of which especially the labor contract is an incomplete contract to enable coordination by managerial hierarchy (Simon 1991). 'Non-price mechanisms' in the definition is used because the transaction costs theory emphasizes the internal hierarchy of the firm (managerial hierarchy) whereas the processes of resource allocation, resource combination, resource mobilization in reality is achieved by many other tools of administration and management, including non-price based self-coordination. The elements in

the definition ‘creates value for society’ and ‘is run on basis of the objective to create wealth increase for its owners or investors’ for many may seem to be contradictory. This elements refers to Adam Smith when he is arguing that the individual pursuit of self-interest serves also the interests of society as a whole, that self-interest and social interest are partners rather than enemies (Medema 2009:19). Or in the famous words of Adam Smith: “It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest.”

The design of the organization of the firm assumes a design of the firm, for the organization of the firm is an instrument to achieve the objectives of the firm. The design elements prior to those of its internal organization can be based on the elements of the formative role of the executive board of a firm (Bleicher 1992; Tricker 1994):

- a. The identity of the firm in terms of its products, services, markets, customer and or technologies and related activities, the definition of its business (Abell);
- b. The mission of the firm, and related to that a generic level of ambition, e.g. the Big Audacious Goals as documented by (Collins & Porras);
- c. The hierarchy of values of the firm and its commitment to so called multi-party codes of conduct as proposed by e.g. ILO and the OECD;
- d. The business model of the firm;
- e. The level of risk appetite;
- f. The legal organization of the firm (incorporation) including its system of corporate governance;
- g. Corporate and brand image

Often ‘vision’ is included in such lists. Often vision is taken as a mixture of the interpretation of the market in terms of opportunities and related to that ambition. Ambition is the driver of all, but vision is not a thing, subject to design, vision should be a continuous process (which may need some design in view of the psychological processes which play at this

process) to observe and to interpret changes and developments in the outside world and inside the organization as well and to interpret these, in view of the mission, values and ambition in terms of actions to be taken to adapt the operations to those changes and developments.

2.3 Organization as a multi-faceted phenomenon

A firm not only has an internal organization, but carries other organizational facets as well. Figure 1 displays the concept ‘organization’ in its various meanings and functions. The concept ‘organization’ in social life is being used to denote respectively: firm, the legal organization of the firm, how the financing of the firm is being organized, the internal organization of the firm and its external organization.

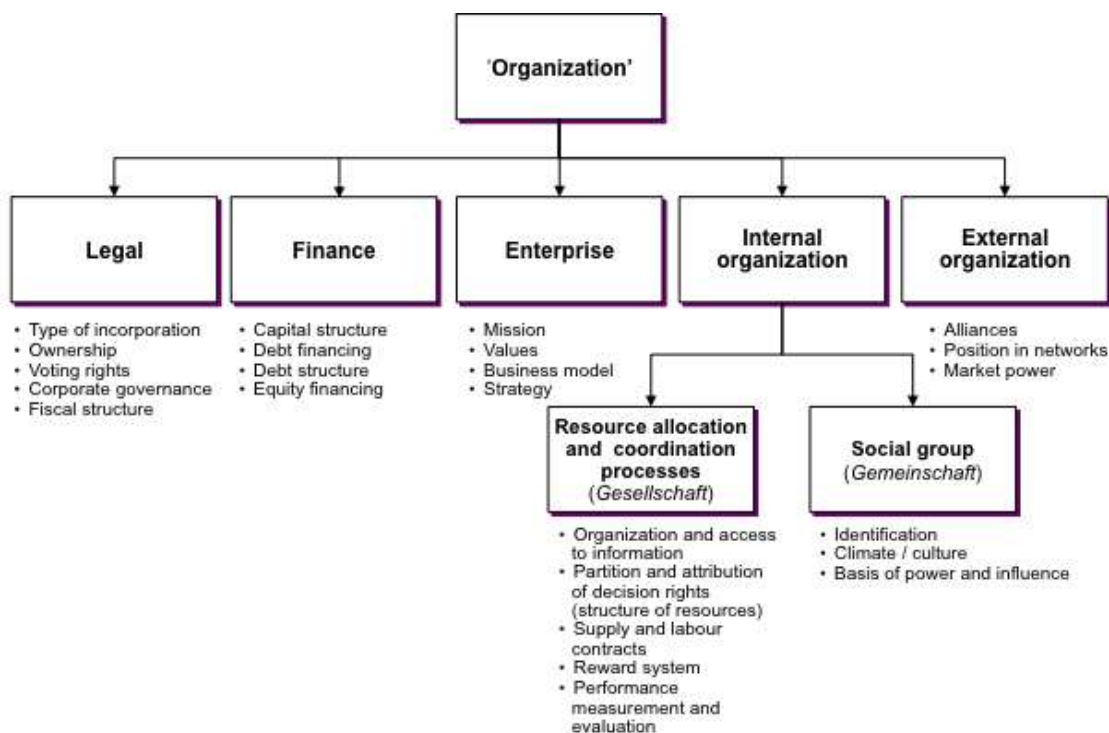


Figure 1. Overview of the different concepts of ‘organization’ in relation to the concept of the firm.

A firm as defined in § 2.2 has organizational aspects of its own: its mission, its identity, its hierarchy of values, its business model, its strategy, its reputation. The firm is understood to

be an economic actor in society, which develops, produces and distributes goods and or services on a market. Some see a firm as an institution, a legal persona with its own rights and liabilities; others see the firm as a nexus of contracts. As an actor on the market the firm is being identified by its products, its services, its brand, and varying from case to case by e.g. a mission and or values. Often the size of the firm, especially in terms of employment is taken as a characteristic. Sarasvathy *et al.* (2008) describe the case of Starbuck as an issue of design. The design these authors describe is about choice of products, scope of the business, etc., not about how Starbucks is organized; their description of the design of Starbuck is about the firm. And correctly so; because this design of a firm is prior to its organization.

A firm, unless it is a very small (personal) business, in general needs to be organized in a corporation (a firm needs to be incorporated). To determine the most efficient incorporation of a firm is a design issue in itself. There may be a one-to-one relation between a firm and its corporation, some corporations host multiple firms (e.g. through business units). In general, especially for multinational companies (MNC) firms like Unilever, Shell or Royal Philips Electronics are incorporated in hundreds to even over thousand different corporations (Strikwerda 2009; Theisen 2000). This disregard of *Rechtkongruenz* between the firm and its corporation is for three reasons. First, no international corporate law exists. Therefore multinational corporations, having investments in factories, laboratories and other operations in multiple countries need to incorporate such activities in each of their host jurisdictions. A second reason may be historical. A number of large corporations partly have grown through acquisitions. There may be various reasons, brands, specific rights as e.g. for air carriers, to continue the acquired legal entity. A third reason for designing a specific legal structure is to have strategic flexibility, that specific activities more easily can be divested, without the hassle and costs of disentanglement processes. Other reasons for a specific design of the legal organization may be to structure co-determination (e.g. Royal Philips Electronics in the Netherlands) or fiscal

compensation. Eighty of Fortune's hundred largest corporations have incorporated a special vehicle corporation in the Dutch jurisdiction to enjoy the Dutch fiscal regime, including the tax agreements the Netherlands has closed with numerous countries (Eikelenboom & Groot 2011).

With the emergence of corporate finance and private equity, the way the firm is being financed has become a design issue as well. The design of financing the firm not only is about the capital structure but also with respect to a possible link between the strategy of the firm, the design of incentives, the design of structure of the firm and the structure of debt. The usual way to organize debt is at corporate level with weak links to incentives of managers. Private Equity in a number of cases has organized debt at the level of business units, combining a high debt to equity ratio with a high sensitivity of incentives to financial performance (Jensen 2007). Also, corporate finance as a field of practitioners, analysts and investors, tend to see the firm as a portfolio of self-contained investment projects, in order to pursue portfolio investment management and subsequently want the firms to organize itself accordingly (Grinblatt & Titman 2002; Tirole 2006). This however runs counter Robert's requirement of complementarity of investments and the economic requirement to create parenting value. If the firm organizes itself as one integrated economic system (as in the cases of IBM and Microsoft), investors will set specific requirements to the granularity and number of reportable dimensions, in order to be able to judge whether a firm performs at its maximum. In the traditional unit organization performance measurement and performance judgment was defined on the level of business units, and within that on the level of lines of business, individual products or brands. Granularity in performance measurement on basis of the concept of the unit organization only will stand in the way of exploiting synergies, for that reasons in modern firms multiple dimensions of performance are defined. The finest level of granularity in measuring performance is the level of the individual (Lawler & Worley 2006:127). However, in some jurisdictions, e.g. Germany this may run up against the law.

With respect to the internal organization the design of structure used to be prevalent with many academic authors, but also for many managers and consultants it still is (Bøllingtoft et al. 2009; Burton et al. 2008). Formal structure in an organization is a combination of assigned tasks, an assigned market segment or specialized function, delegated resources and control over these resources, attributed decision rights, reporting line and monitoring, including usually elements as a job title and status corresponding to responsibilities and discretionary powers. Structure used to be applied to implement the strategy of the firm, to control the thinking and behavior of individuals, to concentrate a group of individuals at a specific task, to achieve specialization and thus labor productivity, for a priori coordination, to allocate costs, for control, but also to provide individual workers with an identity and social-psychological safety. Organization theory used to be based on sociology, because this academic branch focused on social structures and phenomena related to structure, like identity, power, status etc. This translated into the field of human resources in terms of job descriptions, job evaluations, entitlement programs, wage schemes, selection psychology based on positions, especially selecting managers whose motivation was based on control over resources. Structure also translated into the accounting & control department as structure of the organization coincided with budgets: *le budget c'est un monsieur*. However this Roman-Weberian based structure fitted a stable society, with stable, linear growing markets and especially tangible assets with no alternative applicability over multiple product market combinations, apart from the fact that sharing resources would induce high coordination costs. This Roman-Weberian structure also organized information: by implication the position holder also was the owner of the information needed to accomplish his task.

Since Williamson (1975) economists have started picking open the black box production function the firm was considered to be. Although no comprehensive and consistent economic theory of the organization can be defined yet, economic organization theory provides increasingly valuable insights and new language to understand and thus to design the

organization of the firm. An example of this is the idea of the firm's *organizational architecture*. The organizational architecture of the firm is understood to contain elements like (Brickley, Smith, & Zimmerman 2001:263; Hannan, Pólos, & Carroll 2007:235; Milgrom & Roberts 1992:20):

Customer Value Proposition + Business model

1. The firm's expressed objectives and values, and other devices employed to unify the goals and behavior of the individual members of the organization and the objectives and values of the firm
2. The partition and attribution of decision rights within the firm, the authority and control relationships and the distribution of effective power;
3. The methods for attracting and retaining members of the organization and resources and the processes by which resources are allocated (Bower 1986; Bower & Gilbert 2005a);
4. The setting of horizontal and vertical boundaries of the organization (Roberts 2004:180);
5. The processes for target setting (design of the objective function), decision making, control, adaptation, organizational learning and developing the members of the organization;
6. The organization of information, access to and sharing of information;
7. The means by which new ideas and knowledge are generated and diffused throughout the organization;
8. The methods of rewarding management and members of the organization
9. The systems to measure and evaluate the performance of individuals, departments and teams, and the organization as a whole.

The economic organization theory, if even still embryonic, provides a richer view on the internal organization, at least at its dimension of *Gesellschaft* (§ 4.4) as does the sociology based organization theory. Therefore it is to be expected that economic organization theory will better be able to deal with complex environments and complex business models as is sociology based

organization theory capable to do. Be it that to accomplish this the issue of the organization of information needs to be incorporated in the economic organization theory to design organizations that satisfy the criterion of requisite variety to answer complexity.

The external organization of the firm is defined by the organization of its industry, as elaborated in the field of industrial organization and within that by a.o. its system of alliances, position in value networks and especially its market power (Belleflamme & Peitz 2010; Carlton & Perloff 2000; De Kuyper 2009; Illing & Peitz 2006). To design the external organization of a firm is the act to define, pursue, create and maintain external control and to create market power. The design of the external organization in general is not considered to an element of organization design of the firm, but it is dealt with as part of the structure-level strategy of the firm (Strikwerda 2005). To design an internal organization includes decisions with respect to vertical integration or not, outsourcing of specific parts of the value chain or not and or business process outsourcing. To make such decision requires a thorough understanding of the distribution of advanced knowledge in an industry and the (future) power relations in an industry (Prencipe, Davies, & Hobday 2003). In that way a close relation exists between the design of the internal organization and the design of the external organization.

3 What is 'design' in 'organization design'?

3.1 Organization: emerging, engineered or designed?

What is specific about designing an organization? In what *organization design* is different from *organizing* or even the daily activity of improving efficiency? With respect to the latter, alike as in strategy, we might think of making a distinction between an emergent organization and a deliberate organization (Figure 2).

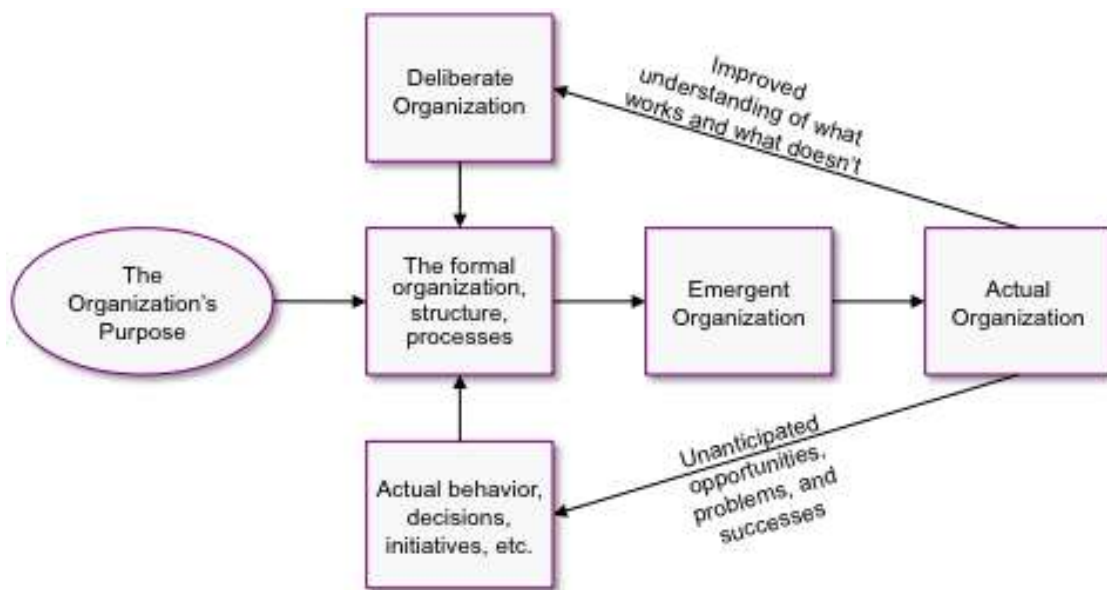


Figure 2. A relation between the intended, deliberate organization, formal organization, the emergent organization and the actual organization. Adapted from (Christensen & Raynor 2003:215).

Some contest that organizations cannot be designed; they see the organization as a social phenomenon that develops organically as the result of a myriad of small decisions and actions. There is a contradiction in denying that organizations can be designed. Formal organizations are human constructions; formal organizations do not result from nature, but from human will. This

contradiction basically has to do with the relation between the individual and the various systems he or she is part of. Is it that the system controls the individual or that the individual controls the system, which is the organization? Organizations are designed to coordinate actions of individuals and groups, but there is a thin line between accepting from a free will consciously being coordinated versus feeling controlled in a constrained, if not dehumanizing way. This is even more of a problem because there is always imperfection and errors between intended action and actual behavior. This difference is a general phenomenon in design by human beings. As human beings we have no perfect understanding of our motives and objectives. Even more, only after the act we develop an understanding of our motives which have lead us to that act (Weick 1982). Next is that there is always an imperfection between our intended design and the way that design is carried out. Because this imperfection has both negative effects and positive effects, a realized design in quite some cases is better as we intended it to be, from which we learn (Figure 2). Also in organization design there may be serendipity.

Some oppose design because it always results in an organization different from what was designed; others see design more as a leap of faith, for exploring and as a learning process. But to turn this observation into a dictum that organization design is a learning process has attractiveness for many and certainly there is learning in organization design, but learning processes have their pitfalls as has been explained in their paper *The Myopia of Learning* by Levinthal and March (1993).

3.2 Design as abductive thinking

Organization design differs from organizing by breaking away from habits, routines, rules of thumb, mimetic behavior. In his book *The Design of Business*, Roger Martin (2009) defines design-thinking as ‘applying the tool of abductive reasoning to a business problem to produce an innovative, efficient solution that is competitive.’ Most of the thinking about how to organize is

at the level of algorithms (engineering), which is applying fixed rules or conventions to a situation to find a ‘solution’. Industrial engineering as organization design mainly is at this level of algorithms, but has achieved tremendous improvements in efficiency in the 20th century.

To define an organization on basis of algorithms is understandable from a viewpoint of efficiency but this approach fails to produce innovative solutions shifting boundaries in efficiency and competitiveness. Below the level of algorithms is the level of (computer)code, as we find in e.g. enterprise systems, workflow management systems etc. (Figure 3).

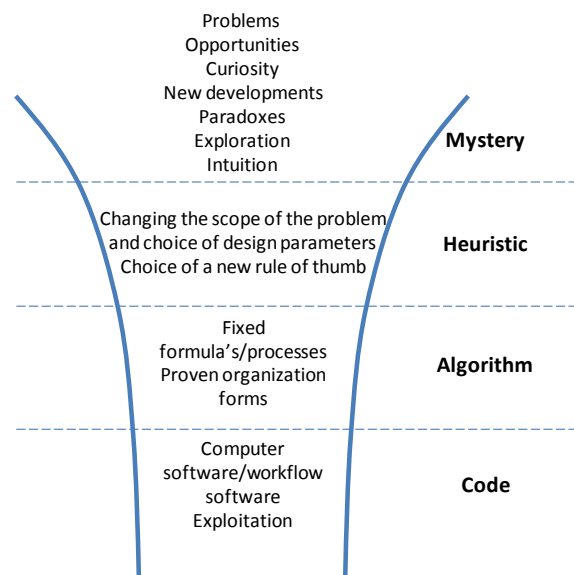


Figure 3. Martin's Knowledge Funnel in business design. Modified from (Martin 2009:8)

Back in 1998 Davenport warned for the loss of competitiveness if firms would continue to use standardized enterprise systems (in which standard business models and processes are coded) (Davenport 1998). Design as defined by Martin is moving the thinking on a problem from the level of algorithms, beyond the level of conventional heuristics (rules of thumb) into the level of mysteries to allow intuition for new solutions to play a role, to take in new insights and to overcome conventional thinking to solve both de nova and familiar problems in an innovative way resulting in higher levels of efficiency. From this play of intuition and exploring

the new and unknown the designer will define new heuristics, by changing the scope of a problem, adopting a different view and selecting a different set of design parameters from, as we will see, the overwhelming number of design parameters. This in its turn may create new algorithms or design rules (usually adopted by followers) and will produce new computer code to create the necessary efficient exploitation through e.g. enterprise systems. Business design and therefore organization design is finding a way out of the trap of existing efficient routines and breaking out, by incorporating new knowledge, into new levels of efficiency and competitiveness. In this way business design is akin to Schumpeter's *Entrepreneur*, who, contrary to the *Wirt*, creates (new) value by *neue Kombinationen* and creative destruction (of old business designs) (Schumpeter 1926). Abductive thinking is what defines the entrepreneur. The entrepreneurs not only senses new market opportunities (temporal and spatial inefficiencies) to be exploited, he also senses (possible) changes in the conditions for production, e.g. due to new technologies, or legislation. As in the case of Murdoch who decided in the eighties to switch to computer based printing of newspapers in London, such changes may evoke resistance, but the capitalist system is a system of creating wealth through creative destruction. Lynskey (Lynskey & Yonekura 2002:374) suggests that "... the entrepreneur is one who learns the lessons from the past and applies the new insights gained to the contemporary needs of the organization and the market." That is to be questioned. If there is anything to be learned from the past with respect to organization then it is that one should be very critical to project past experiences into the future. This is precisely the problem with the role of dominant logic of entrepreneurs, managers and others involved in organization design (§ 8.2). The entrepreneur, with respect to organization design, is the person who sees that things can be done differently (with a higher efficiency) and who manages, often fighting conventional 'wisdom', to make it happen.

Design thinking not only consists of abductive thinking, the essence of design is to integrate various elements of different nature into one whole. This requires the capability of integrative thinking (Martin 2007). There are two levels to integrative thinking. The first is the

capability (knowledge, skill, and attitude) to integrate various aspects of the organization: human aspects, organizational behavior, production, management accounting, legal aspects, information management, etc. Also in a Napoleonic *coupe d'œil* integrative thinking is to see the relation between the strategic level of the firm, of the design of the organization and its operational aspects. The second level of integrative thinking is about the process of integrating intuition, reason, and imagination to develop a holistic understanding and view to solve a problem and make decisions with respect to the organization.

3.3 Elements and steps in organization design

If abductive reasoning is the core of organization design, and design no longer is selecting an organization form from a standard set organization forms of other mimetic behavior, what than can be said about the objects of this abductive reasoning and the process of abductive reasoning? After al reasoning suggest some level of analysis, using facts, criteria and logic. Abductive reasoning is not unexplained intuition. An important element, following the entrepreneurial attitude in organization design as explained in § 3.2 is to see that things can be done differently from the past, because e.g. due to technological developments a constraint has changed into a design parameter. This suggest that the anatomy of decision making can be used as a tool, because this anatomy includes elements like identifying criteria, constraints and parameters which can be influenced, apart from other elements. Below we will apply the elements of decision making on organization design, a more compete account of this is dealt with in § 8. Next to that an example is presented which illustrates how a contextual factor can change from a constraint into a design parameter

Applying the elements of a decision process on organization design for the time being will results in the following elements and steps:

issue of the legal organization

1. Designing the *objective function* of the firm, especially with respect to financial and non-financial objectives and constraints (§ 8.5);
2. Identifying design *parameters* (structure, decision rights performance parameters) over which decision makers have control to set these;
3. Identifying design *theories* that is relating design choices to outcomes, if $X \rightarrow Y$, that is cause-and-effect relations.
4. Identifying design *criteria* which need to be observed, e.g. those with respect to safety, accounting standards and others of a technical nature;
5. Identifying design *constraints*:
 - a. Self-imposed constraints, explicit constraints e.g. those based on values (e.g. consensus decision making), implicit constraints, those induced by dominant logic;
 - b. Constraints imposed by law or regulators, e.g. the requirement that financial firms have a separate risk management function organized as opposed to risk management being integrated in the management control system, compliance;
 - c. Constraints imposed by stakeholders, e.g. some investors preferring a unit organization for reasons of portfolio management.
6. Identifying design *assumptions*, e.g. the nature of assets (alternative deployable or not) costs of information and communication, capital intensity of managers and workers (Arrow 1974), and new design opportunities or restrictions emerging from changes in assumptions, e.g. new design opportunities induced by the vanishing costs of information and communication.
7. *Documenting* the design in such a way, e.g. in the format of a management charter (Strikwerda 1998), that the design can be communicated, discussed (and thus internalized prior to implementation), audited on completeness and consistency *prior* to formal decision making and implementation, and can serve as a reference for auditing the actual organization against intentions and assumptions.

The design of an organization is not the organization. An organization comes into being and existence by actions, conscious or unconscious, deliberate or spontaneous. A design, especially the process of designing, merely serves to prepare the mind and to be prepared.

An example of a well known and widely applied design rule is that with respect to whether responsibility centers or accountable entities should be dealt with as costs centers or as profit centers in the design of the organization (Figure 4).

Unit Type	Performance Measures	Decision Rights	Typically Used When
<i>Cost center</i>	Minimize total cost for a fixed output Maximize output for a fixed budget	Input mix (labor, material, supplies)	<ul style="list-style-type: none"> o Central manager can measure output, knows the cost functions, and can set the optimal quantity and appropriate rewards o Central manager can observe the quality of the cost center's output o Cost center manager has knowledge of the optimal input mix
<i>Revenue Center</i>	Maximize revenues for a given price (or quantity) and operating budget	Input mix (labor, material, supplies)	<ul style="list-style-type: none"> o Central manager has the knowledge to select the optimal product mix o Central manager has the knowledge to select the correct price or quantity o Revenue center managers have knowledge of the demand curves of the customers in their sales districts
<i>Expense Center</i>	Minimize total cost for a fixed level of services Maximize service for a fixed budget	Input mix (labor, material, supplies)	<ul style="list-style-type: none"> o Output is difficult to observe and measure
<i>Profit center</i>	Actual profits Actual profits compared to budgeted profits	Input mix Product mix Selling prices (or output quantities)	<ul style="list-style-type: none"> o Profit center manager has the knowledge to select the correct price/quantity
<i>Investment center</i>	Return on investment Residual income EVA	Input mix Selling prices (or output quantities) Capital invested in center	<ul style="list-style-type: none"> o Investment center manager has the knowledge to select the correct price/quantity o Investment center manager has the knowledge to select the optimal product mix o Investment center manager has knowledge about investment opportunities

Figure 4. The relation between the choice of type of responsibility center, performance measures, decision rights, and information asymmetry as an example of a design rule (Brickley, Smith, & Zimmerman 2001:433)

The design rule in Figure 4 relates the choice of type of responsibility center (the left hand column) to the nature of information asymmetry (in the right hand column). The choice of type of responsibility center determines the performance parameters, and thus the decision rights.

The constraint in this example, information asymmetry (Wall 2006), is based on the costs of information and the way information is organized in the organization of the firm, that is within the structure of the organization (Stinchcombe 1990). Related to this is that to coordinate

activities between departments, e.g. between manufacturing and sales, both responsibility centers, both being profit centers, use is made of transfer prices. Defining both manufacturing and sales department is the case in MNCs with a matrix of product divisions (development & manufacturing) and country divisions (sales & marketing) In the case the manufacturing department can set prices to the sales department this induces the phenomenon of double mark up, resulting in a suboptimal performance of the firm (Brickley, Smith, & Zimmerman 2001:484-5). The costs of information are declining (Jorgenson 2001) as are those of communication, and communication becoming reliable, unrestricted by capacity and having real time speed. As a consequence instead of organizing the general ledger per country as IBM did before 1992, it is possible to organize one global general ledger on which all entities of the MNC are plugged in. So Philips Electronics used since about 1990 one data base globally for all its countries and divisions. Because computer memory has become cheaper IBM extended the length of the record of a transaction in the general ledger from 80 positions (the old punchcard) to 200 positions, allowing to record transactions with multiple attributes. Also this allows for recording in detail the use of resources related to products, customers etc. As a consequence the transfer prices between manufacturing and sales can be replaced by allocation costs and revenue so that the production level can be set on basis of an integrated firm and thus the suboptimal performance resulting from information asymmetry is eliminated.

Accordingly it can be observed that the distinction between costs centers and profit centers is disappearing (Kaplan 2007). Companies like IBM, Nestlé, ASML did see and applied this new opportunity created by the declining costs of information, but it must be noted this was in combination with market developments requiring the moves they made as well. A next question to be asked why only so few companies are following this path. In this case the abductive reasoning not only is with respect to using the opportunities created by declining costs of information, it also requires conventional organizational rules to be broken. The conventional rule being that countries and divisions are ‘owner of their information’, the conventional ruling

being Venkatraman's *Business-IT-alignment paradigm*, the conventional rule being that for many managers information asymmetry is a source of power and many executives assuming that a power base should not be disturbed.

4 The functions of the (internal) organization

4.1 The metaphysical nature of organization

An issue with respect to designing organizations is that an organization is not a physical thing, with a mass, Euclidian dimensions, nor weight. If we say that we observe an organization in reality we infer the existence of an organization from various facts and behaviors in the way we infer the lines of a magnetic field from the patterns of iron filings on a piece of paper which is held over a magnet. An organization is a metaphysical object of our thinking and communication. This metaphysical nature of the organization however does not deny that it has real consequences. This combination of the metaphysical nature of organization and the reality of its consequences on how individuals behave, makes its for many difficult to discuss the design of an organization. An organization is many things to many people and subsequently multiple definitions of an organization exist. It is not a matter of which definition is right or wrong, dependent of a problem to be solved one definition may be more helpful than an other.

Scott (2003:25-30) discusses three types of definitions for organization (Scott uses 'organization' for both firm/institution and internal organization): the rational system definition, the natural system definition and the open system definition.

4.2 Organizations: Rational, Natural, and Open Systems

According to Scott (2003:26-27) the rational system definition defines organizations to have structural features that distinguish organizations from other types of collectivities: relatively high goal specificity for which a relatively high formalization is deployed to coordinate the activities and interactions of participants consciously and deliberately. A question resulting from

this definition is (Barnard 1948) whether individuals are part of the organization as a system or not. Not, if the organization is defined as a system to coordinate the activities of the members of an organization. Which is consistent with the observation that in many firms and institutions the internal organization has a continuity to a large extent or even completely independent of the turnover of its members. By excluding the members (managers, workers) of a firm from the definition of the internal organization turns the internal organization into a designable phenomenon. To include the members of the firm as constitutive elements in its internal organization induces doubts whether internal organizations are deliberately designable.

Scott's (2003:28) natural system definition of organization is: Organizations are collectivities whose participants are pursuing multiple interests, both disparate and common, but who recognize the value of perpetuating the organization as an important source.² This definition of organization is akin to the view that the firm is not an institution, as follows from its incorporation, but is a nexus of contracts (Alchian & Demsetz 1972). Perhaps Jensen (1983) phrases this more precisely: "I believe it is productive to define an organization as a legal entity that serves as a nexus for a complex set of contracts (written and unwritten) among disparate individuals." In doing so Jensen defines not 'organization' but the *corporation* in which the firm is incorporated as the instrument to supplant the contracts between the cooperating agents by unilateral contracts between the agents and the legal entity that serves as the contracting nexus. So 'organization' in Scott's natural system definition should be read as: 'the firm and its corporation(s) in which it is incorporated ...'. In the twentieth century the internal organization of a firm was composed of managers and employees only. Agents like shareholders, banks, suppliers and customers were distinctly separated from the internal organization. In today's open

² The second sentence in Scott's definition, 'The informal structure or relations that develops among participants is more influential in guiding the behavior of participants than is the formal structure', deliberately is left out because: (a) it is an explanation; (b) the claim in that sentence is questionable in view of insights from the field of organizational behavior.

business models with co-creation with customers and active shareholders (private equity), temporary workers employed through an employment agency, interim managers, temporary self employed project leaders, consultants etc., the boundary between the legal organization and the internal organization of the firm seems to be blurred. To define the internal organization of the firm as a nexus of contracts has appeal to some. The problem however is that many of those contracts are implicit and incomplete. Also those involved differ by bargaining power and information so much so in a number of cases that it is to be questioned whether it is fair to see the organization as a nexus of contracts. Another aspect of the organization as a nexus of contract is that writing those contracts, even if incomplete and or implicit, carries transaction costs, whereas the *raison d'être* of the firm according to Coase is precisely to have lower transaction costs as has the market.

Simon (1991) defines four aspects of an organization that sets it apart from the market mechanism.

The first is authority of management and the acceptance of that authority by the employee based on a labor contract as an incomplete contract. The incomplete labor contract allows the firm to absorb uncertainty because the employee is willing, within a certain zone of acceptance, a range of jobs on order.

The second is motivation based on rewards that are based on an intense interdependence of the contribution of workers to the goals of the organization. Workers and employers may want to know individual contributions to the goal of the organization, but in case of interdependence the individual contribution will be higher than absence of it. The interdependence, especially in the case of interaction between creative knowledge workers, whose mutual contributions cannot be contracted in an efficient way, is what makes the organization more efficient as is the market mechanism.

The third element, which Simon considers the most important, is that in an organization there is a critical number of employees which identify themselves with the goals of the

organization, especially its products, technology, customers and markets served. The source and mechanisms of this identification may be complicated, and include a certain congruence between organization values and personal values, that achieving organizational goals is congruent with achieving personal goals and morality (Etzioni 1988) At a deeper level the source of identification is an awareness that a human being depends for survival on the immediate and broader surrounding society. This identification has as a result that employees will come up with those initiatives needed to achieve organizational goals and to improve operations, without explicit instructions from higher level management. With that identification compensates for many flaws and errors in organization design, its executions and managerial actions. There is a downside to identification as well. If identification is weak on the overall goals of the organization, but strong on the position of the individual, this may hamper adaptation, exploration and required redesign of the organization.

The fourth element of Simon with respect to organization as distinct from market is coordination, through other mechanisms as prices. These will be explained further in § 5.

Scott's third definition, the open system definition (2003:28) defines: organizations are congeries of interdependent flows and activities linking shifting coalitions of participants embedded in wider material-resource and institutional environments. An alternative might be to conceptualize the internal organization as an open architecture, some of its modules belonging to the firm, others to third parties (Ethiraj & Levinthal 2004b).

Cybernetics teaches that living systems need to have an open exchange of information with their environment as a first requirement to survive in a changing environment. For that reason the open system definition not so much defines organizations, as it hints to a design requirement in order that organizations as living systems are capable to survive.

In designing organization we need to be prepared that different individuals involved in it, most likely will reason from different, often not made explicit assumptions on what an organization is, or what its key elements are.

4.3 Functions of the internal organization

Following Gellerman's *In Organization, as in Architecture, Form Follows Function* (Gellerman 1990), another approach to designing the internal organization of the firm is not through what it is or might or should be, but by its function. So the question we should ask ourselves is: what is the defining function of the internal organization of the firm? E.g. the corporation in which the firm is incorporated serves to separate private capital from the firm's capital to enable capital accumulation, as well as that the corporation serves as the legal vehicle for contracting with third parties involved in the firm.

In the case of the internal organization, following Coase, the primary function of the internal organization is claimed to be the coordination of departments and individuals. Coordination is indeed a core function, but the emphasis on coordination tends to obscure that the organization also is a production process, developing and producing goods and services. The emphasis on coordination tends to translate itself in planning, resource allocation processes, attribution of decision authority, that is typical administrative tasks, but as Fayol explains in his *Administration Industrielle et Générale* as much the processes of production, procurement and sales need to be organized. The latter translates itself into the organization of operational delivery processes, *independent* of organizational departments. The new business models emerging after 2000 need much more precisely translated into processes, compared to those of the last century. As a consequence the relation between designing the administrative dimension of organization (budgets, control) and the organization as a set of operational processes need to be disentangled, as is to be seen in e.g. Kaplan & Norton's strategy map.

The internal organization of the firm also can be conceptualized as an instrument of the firm tasked to achieve the goals of the firm. This suggests that in order to design an internal organization, according to the dictum of ‘form follows function’ we first need to understand the goals of the firm. What the goals of the firm are or should be seems to be subject of political debates: profit maximization, shareholder value or shared value (Porter & Kramer 2011), or simply producing those goods and services a needed for the growth of the economy and the welfare of society, taking into account as well certain values, principles and ethics of society. (Whetten, Rands, & Godfrey 2002).

In this paper the more neutral stance is adopted from welfare economics that the goal of the firm is to create value, this is the difference between the maximum-willingness-to-pay by the consumer and the costs of resources (Motta 2004). The price P of a good or service divides this value into the consumer surplus and the producer surplus. The producer surplus is the source of financing the growth and the future of the company (innovation) and to pay the shareholders a dividend. This objective of the firm is consistent with the definition of the firm as explained in § 2.2.

The objective of the firm will be to maximize this value creation over de life-time of the firm. How value is created is changing. In the twentieth century value creation was defined by exploiting scarcity of resources, resulting in either Ricardian rents or Schumpeterian rents. In an unsatisfied market product push strategies would be effective and the main objective of the internal organization was to achieve efficiency through economies of scale, learning curves, innovative work methods, functional specialization and efficient coordination. Manufacturing processes mainly were defined by the nature of technology, materials, type of energy conversion and transmission, and the nature of products. The general design philosophy was Taylor’s one-best-way although the socio-technical approach demonstrated that by a given technology alternative types of organization of work could be applied, each satisfying the criteria of efficiency, but ranking differently in terms of motivation and work satisfaction.

Innovation both for new products and for new production processes was organized separately from manufacturing and other operational departments in separate departments for research and development. With that also the management of the short term agenda of the firm was separated from the management of the long term. As a consequence the main emphasis of the internal organization of the firm is on economizing.

This economizing exists of three levels in the organization (Williamson 1994). The first level is that of the adaptive capacity, speed, precision, of the organization to changes in demand and supply, and changes in prices of products and resources (Hayek 1945). This adaptive capacity depends on a number of factors, e.g. sensing changes in demand and prices timely, which may depend on distribution channels, access to POS-data etc. and the nature of products, lead times in production, flexibility in equipment, etc., and the way the architecture of a product or manufacturing process is designed, modular, open or closed architectures (Baldwin & Clark 2002b; Christensen & Raynor 2003).

A second level of economizing is the elimination of waste. Waste may exist in the form of inefficient manufacturing or other processes: unnecessary process steps, insufficient or wrong use of tools, avoidable waiting times, lack of sufficient training of operators, poor planning, poor quality of information, etc. Waste may also exist in the form of avoidable low quality of materials, use of materials (low materials productivity) and waste of energy (low energy productivity). Avoiding waste is typically the field of industrial engineering and Total Quality Management.

A third level of economizing is the curbing of bounded rationality and satisfying behavior through the use of hierarchy: hierarchical decision making, hierarchy based control, target setting, resource allocation and hierarchy based incentives.

These three economizing functions of the internal organization assume that the firm creates value on its own, and that it engages with suppliers and customer on basis of arms length,

complete contracts. The value creation process in varying ways and degrees is migrating in various forms into co-creation between suppliers and customers (Prahalad & Krishnan 2008) or even is moving into the market in the case of network industries (Shy 2001). Related to this is that the creation of new knowledge and new products or services becomes distributed in the organization, especially in the interface with the customer. The management of the short term and of the long term therefore no longer is fully separated in distinct departments. To this relates, but this is also induced by the decreasing costs of information, that operations and conduct-level strategy converge. Due to the increasing role of information, the functions of the internal organization of the firm, production, resource allocation, economizing, knowledge creation, product development, tend to be more distributed organized in the internal organization.

4.4 Organization: *Gesellschaft* or *Gemeinschaft*?

In general no unidirectional relation exists between goals and internal organization, as goals may be restricted by achievable capabilities of the internal organization or the internal organization heavily influencing the goals, e.g. through agenda framing.

For most members of an organization the organization also has a quite different function, distinct from coordination and production. Members of an organization also seek in that organization, often unconsciously, economic and psychological safety, identity, belongingness, confirmation of their self-respect, justice and fairness. For them the function of the organization is that of *Gemeinschaft* (community). A *Gesellschaft* (§ 4.3) that doesn't provide a *Gemeinschaft* has little chance to be efficient or innovative. A *Gemeinschaft* without an efficient *Gesellschaft* stands little chance to survive. The need (wo)man has for *Gemeinschaft* explains why not always organization design is based on a given goal, but that cases exists that the *Gemeinschaft* in order to survive, produces a goal, hence some authors define organizations to be a collectivity of

individuals pursuing a common goal defined by the members of the organization. From that perspective the internal organization of the firm is not an instrument of the firm, but an objective in itself.

With respect to designing the organization, following the rule *form follows function*, the question is whether the function the internal organization as *Gesellschaft* conflicts with the function of *Gemeinschaft*. Phenomena like satisfying behavior, escalating commitments to department budgets, resistance to change suggest that the functions of *Gesellschaft* and *Gemeinschaft* are conflicting. Those advocating culture programs to achieve new levels of performance and innovation appear to reconcile those two functions, but assume a conflict to be solved by using culture as the collective programming of the mind (Hofstede 1980). Alike those who include in the function of the internal organization motivation (Barnard ; Milgrom & Roberts 1992:25-27; Roberts 2004), to be achieved through a well designed system of incentives.

The internal organization in the period of the economy of the Second Industrial Revolution provided life-time employment, entitlement, social status, a social identity salient over personal identity. Paid for work occupied the main part of the workers life-time. Life-time employment is replaced by temp work, job-hopping, employment per project, self-employment; the labor market has become mobile. Entitlement is being replaced by performance based pay. Workers tend to see themselves as a unique individual with the personal identity salient. Identification is multiple, amongst other with professional peers rather than the firm. Durand has explained the great transformations in work (Durand). Work for many no longer occupies the main part of their life-time. Work for many no longer is manual labor working on physical objects, but is working with data and information. Workers, managers, executives, due to the media technology, including the Internet, live in the same information space. Worker's minds are as much programmed by information from outside the organization, if not more, as by information from inside the organization.

So it might be that the function of *Gemeinschaft* through which implicit much of the coordination was conducted, due to sociological, demographic and technological developments has changed by nature and by weight in the life of the individual worker. At the same time, because of the weakening of societies traditional institutions (§ 6) a new emphasis for behavior in organization is growing, this time in terms of ethical behavior. In a way the organization is replacing the role of institutions with respect to ethical behavior and discipline.

This diminishing role of the *Gemeinschaft* function for workers, is responded to by managers in emphasizing the role of culture, values and psychological factors (misleadingly labeled ‘soft factors’) in their relations with workers. This response is appropriate where it answers the need of the worker for acknowledgment, self-esteem, and to be respected as a person and as a professional. Also this response is justified where it acknowledges that the source of motivation in the new generation is shifting from based on control over resources to being based on making an acknowledged contribution to the collective performance. Also the concern for these psychological factors at play is an expression of the need of the newer generations to pursue both personal advancement and organizational citizenship true loyalty to the organization (but not necessarily exclusive to the organization), rule following behavior and extra-role behavior (Haslam 2004:78).

Where this concern for psychological factors tends to be applied as an instrument to influence thinking of workers, their attitude and thus is being used as an instrument of control, it turns out to be counterproductive. For two reasons. First hierarchical control of attitudes and thinking limits the information processing capabilities of the firm and thus its capability for adaptation. In § 9.2 it is explained what a more efficient instrument is to guide workers towards initiating and making sensible decisions in the organization. Second, the modern worker has little appreciation for a paternalistic way of being manipulated with respect to her or his decisions. What they are looking for is an explicit exchange of objectives, constraints etc. to take initiatives.

Some authors see culture or soft systems as a design variable of the internal organization. In a world of media, information overload, mobile labor markets, professional training, individuals with new self-images compare to the past, even multiple selves, multiple identities, in which the level of assumptions of culture is demystified by progress in academic analysis, it is to be questioned whether the traditional concept of organization culture still can be applied. In § 8.6 an alternative is offered.

5 Dimensions of organization design

5.1 The internal organization: sub-systems or *Gestalt*?

The organization as a production system and its function of coordination suggest the internal organization to be a coherent system or *Gestalt*. In general those involved in or with an organization, either by being a member of it, working with an organization or observing an organization, discern many different aspects in an organization: functions, budgets, job qualifications, processes, values, information, etc. An overview of the various aspects, respectively elements of the internal organization is depicted in Figure 5, categorized by the type of coordination mechanism (imposed coordination *versus* self-coordination, explicit coordination *versus* implicit coordination) in the internal organization.

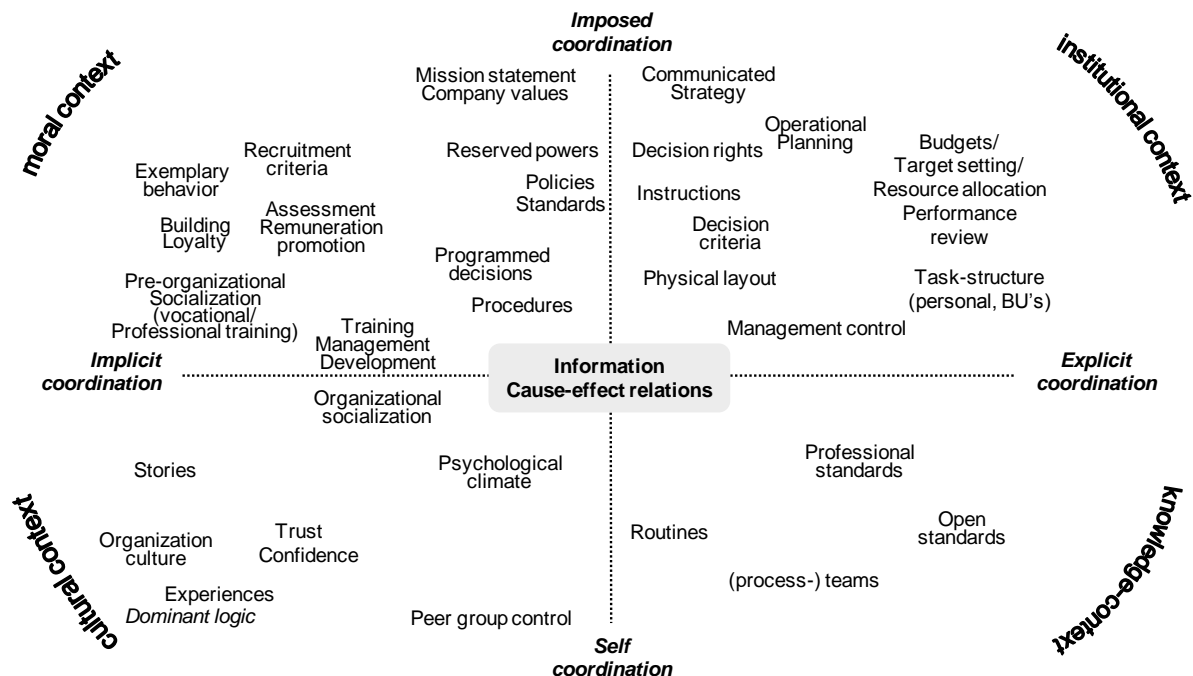


Figure 5. Overview of aspects of the (working of) the internal organization of the firm, categorized by type of coordination mechanism.

The overview of elements of the internal organization as depicted in Figure 5 does in itself not provide any basis for a method how to design the internal organization of a specific firm. At best it suggests what the various aspects are to be designed, individually and together as a coherent system. The four quadrants induced by the opposites imposed coordination—self coordination and explicit coordination—implicit coordination hint at some other aspects of the internal organization which are not explicit in Figure 5. The upper right quadrant by many will be associated with the formal or material organization, whereas the upper left quadrant will be associated with the social organization. The lower left will be associated with culture, whereas the lower right quadrant expresses that increasingly coordination mechanisms as deployed in the internal organization are defined from outside the organization, e.g. through professionalism and creative knowledge workers.

The number of elements playing a role in coordinating the activities in an organization as depicted in Figure 5 makes it understandable that (re-)designing an organization is subject to lexicographic decision making or sub-goal decision making, that is that only a number of the elements are selected for design. This in itself needs not to be a wrong decision as it might be that the four quadrants are subject to different types of design or development. Alike as with coordination design as an activity has multiple appearances: design may be teleological, to achieve a preset purpose, as well as it may be generative developing as a results of all kind of small decisions. Design may be conscious, as well that it may happen unconscious. Design may be initiating, starting as we will explain in this paper, from designing a new business model, other design may be of a more planning or executing nature, whilst organization development also might be considered as a form of design. The institutional environment as well the increasing professionalism of various functions also induce design criteria to the organization. So the various types of design might be projected on the organizational elements of Figure 5 as in Figure 6.

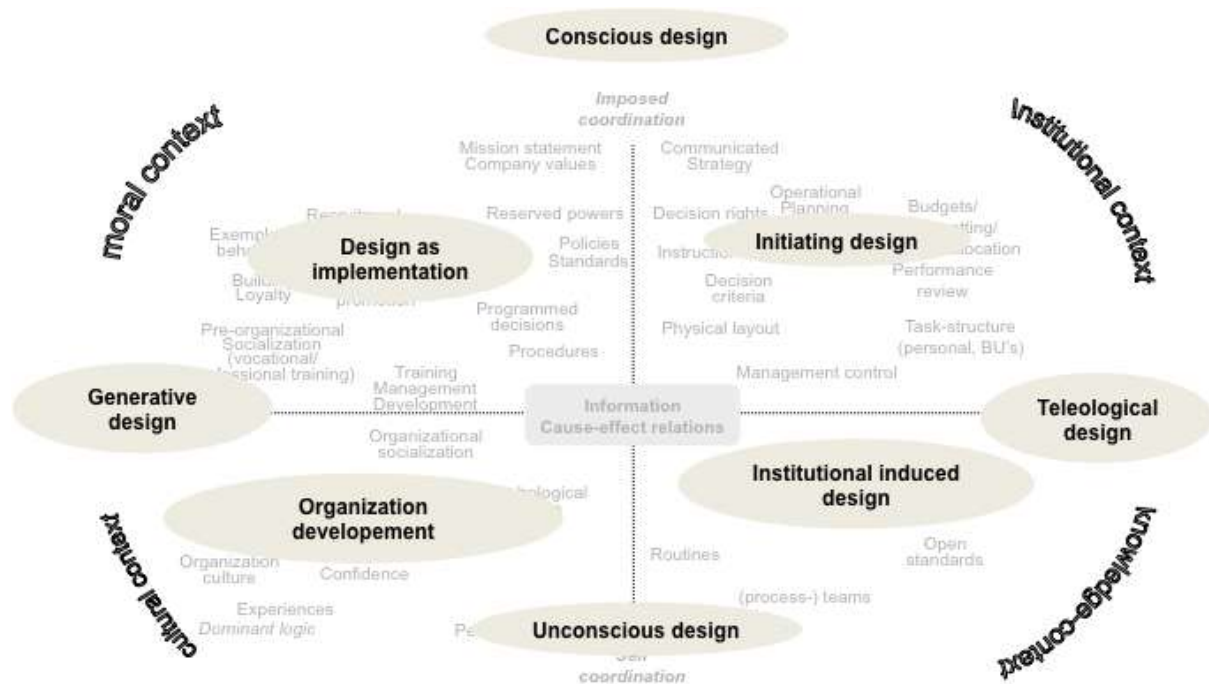


Figure 6. Different types of design projected on the different types of coordination instruments of the organization

Gestalt not only refers to that in organization design we need ‘to see the whole board’ but also to the gestalt theory in psychology as formulated around 1900. Due to bounded rationality and other psychological mechanisms, as well due to the design process and sometimes conflicting criteria a design needs to answer, most likely no such thing as a perfect design will exist. When proposals of design are presented and discussed most likely a number of the laws of gestalt theory will be at play (Chang, Dooley, & Tuovinen 2002). These laws are about visual observation, but because organization design often is presented in a visual way, most likely some of these laws apply to the process of organization design. There are eleven gestalt laws. One of these is the Law of Closure, which is related to the Law of *Prägnanz*. From these follow that when in a proposed (organization) design elements are missing, the mind will tend to complete by itself those missing gaps. As is implied by this paper, an organization chart is a very incomplete design. But to many an organization chart suggests the attribution of decision rights and delegation of resources they are after, and thus assume these on basis of the chart, whereas both decision rights and resources are allocated on basis of approved budgets, not charts. The latter requires the design of the resource allocation process as an explicit element in organization

design. But the Law of Simplicity implies that (organization) designs are presented (over) simplified in the process of discussing designs, with a preference of structure over processes. The Law of Isomorphic Correspondence implies that proposed images on a new organization design are interpreted on basis of past experiences with organization, making it difficult to understand the value of new designs or even making it for some people impossible to see what is new in a design. The Law of Balance/Symmetry implies that in an organization design the mind will look for balance between the elements in the design, e.g. the size or weights of different departments, which in the case of organizations may cause problems to start new activities. Alike the Law of Unity/Harmony will look for congruity between the elements of organization design. Both laws (balance – unity) are at play to organize new businesses, start ups, corporate venturing in an existing firm, because often these are small, have small markets, small budgets, different business logics etc. As a result of which the conventional organization mind tends to eliminate these new elements, needed for development and growth of the firm, from the design of the organization (Christensen 1997).

5.2 Dimensions of organization (design)

Is a coherent, comprehensive model for organization-design possible? To design the internal organization of the firm, given the architecture of its customer value proposition (§ 7.4), requires a myriad of aspects and decisions (HR, finance, accounting, information, IT-systems, organization of resources, logistics, etc.) which are not straightforward defined by this architecture. Is it possible to conceive a model which assists the designer of an organization to see all these relevant aspects, structures, levels, design parameters, relations, etc.? That is, a model that helps those involved in design to see all these relationships, but also the limitation of scope and assumptions of algorithms and heuristics for organization design in-use and provides the designer with a view to the level of mystery (Figure 3)? Different attempts have been made to formulate comprehensive models for organization, e.g. the 7-S framework and those listed in the

Introduction. Although such frameworks may be very helpful to develop an overview on the various aspects of an organization, such frameworks hardly present design criteria beyond the idea that the dimensions of the framework need to be designed.

To assist the thinking and communication with respect to the various aspects of the internal organization, three dimensions are defined:

- (1) Internal Governance—Production Function;
- (2) Material Organization—Social Organization, and
- (3) Structure—Processes

These three dimensions are arranged on the ribs of a cube (Figure 7).

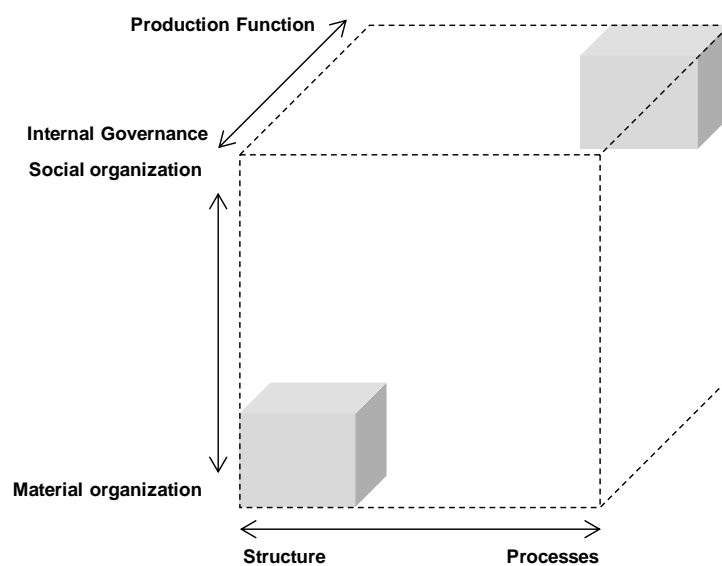


Figure 7. Three design dimensions of the internal organization of the firm.

To arrange these three dimensions on the ribs of a cube, which is on orthogonal axis, is to suggest that the three dimensions have an independency as variables. The level of internal governance has both material aspects and social aspects, as it has structural dimensions and process dimensions. But these typical will be of a different nature at the level of production

function or innovation. The arrangement of the dimensions and aspects of organization on the cube in Figure 7 are based on the cube published by Alberts & Hayes (2006:75). Their cube is based on the dimensions *allocation of decision rights*, unitary or peer-to-peer (the dimension structure *versus* processes), *patterns of interaction*, tightly constrained or unconstrained (the dimension material organization *versus* social organization) and *distribution of information*, tight control *versus* broad dissemination of information (the dimension internal governance *versus* production function). In the view of Alberts & Hayes the military organization which emphasizes internal governance, material organization and structure, is the classical command & control organization (the small cube left below in Figure 7). Whereas an organization in which are emphasized the production function, social organization and processes is an *edge* organization (the small cube upper right in Figure 7). This certainly is a useful distinction in case the achievement of goals and the survival of an organization depend on (local) information superiority as in the modern military. This *edge* organization then is to be seen as the collection of processes developing and producing the modules of the architecture as explained in § 8.

However, in view of Herbert Simon's concept of the complex organization (Simon 1962; Simon 1973; Simon 1996), the cube in Figure 7 also may be thought of to exist of a set of nested subsystems, like the nested Russian matryoshka dolls. Although unlike the matryoshka dolls, subsystems e.g. atoms, will be different from the enclosing systems, e.g. molecules. Alike in business, a division as a subsystem of the firm will comprise e.g. a sales department as a subsystem of the division as a subsystem. Another difference between business systems and the linear matryoshka dolls is non-linearity: subsystems like e.g. a project to create cross business unit customer synergies, cross multiple subsystems and even may extent into the system of the customer.

An essential issue in the design of organization within such an open, non-linear architecture of systems are information processes in the sense of *loosely coupled* programming. Loosely coupled programming is to say that the programming is not completely, imperfect,

disturbed, and delayed or a combination of these. The change in the fifties from management by instruction to management by objectives was a deliberate move to introduce this *loosely coupling* to increase the information processing capacity and speed of the organization. Also the programming not necessarily is unidirectional, but may be bidirectional (e.g. either through agenda manipulation, framing of issues and or through learning processes, bringing into the system new customer requirements. This loosely coupled programming in the traditional organization is through command & control in combination with the process of target setting and resource allocation. In the modern organization, this loosely coupled programming is to be achieved through the architecture of the value proposition, respectively by communication methods as suggested by Kaplan & Norton (2004, 2008), including elements as a clear mission, hierarchy of values and fast feedback, the latter are needed to have loosely coupled programming, decentralized entrepreneurial decision making whilst maintaining the integrity of the firm.

The cube in Figure 7 also helps to understand that designing an organization at different levels may include the same dimensions like material organization, social organization, structure and processes, but that these have different meanings, are different things, are subject to different design algorithms or design heuristics and have different constraints at different levels of the organization. Designing the organization of a single product factory is a different thing from designing the governance system of a multi-product multi-market multinational corporation. Also the method and process of design might be different at different levels as might be theories used in design processes.

The first dimension, internal governance – production function, is to acknowledge that the internal organization of the firm not only is an economic input-output black-box type production function (as assumed in neo-classical economics) existing of operational processes, it is also a governance system (Williamson 1975; Williamson 1985). This dimension provides the

linkage between the market of resources and the production function of the firm. But also Marshall, quoted by Swedberg (2003) suggests that ‘organization’, this is also internal governance, can be seen as the fourth production function, which is consistent with e.g. the concept of break-up value as used by corporate finance to judge the value of a system of internal governance, that is the added value of corporate to its businesses and to its shareholder.

The second dimension, Material Organization—Social Organization, was that defined by Fayol (1918/1999) when he stated that one of the duties of the management of a firm is *constituer le double organisme [de l'organisation], matériel et social de l'entreprise*. This is akin to the distinction between the organization as a *Gesellschaft* and as a *Gemeinschaft* as explained in § 4.4. It should be noted that the internal organization as a social organization is different from the informal organization as induced by the formal organization (Katz & Kahn 1966; Mullins). The informal organization is the pattern of social structures and relations that emerges spontaneously and is being maintained within the context of a formal organization. The informal organization serves to protect the individual from the disintegrating effects of the formal organization on its personality, that is to maintain self-esteem. Also the informal organization for some is the vehicle through which to commit themselves to the formal organization. Therefore, the informal organization should not be an object of design. However, when the informal organization becomes dysfunctional (negative sociability, negative solidarity, unobtrusive controls), corrective actions may be needed, usually by replacing or removing the gatekeepers of the informal organization.

According to Herbert Simon (1991) the efficiency of the internal organization a.o. depends on identification, that is the extent to which members of the organization can identify with the goals, the values, services and goods the firm produces. This identification is requisite for initiatives within the organization to be adaptive to changes in its environment. In its turn the organization as a *Gemeinschaft* depends on the effectiveness of the firm to provide economic

security as a basis for all those other needs of its members. To this needs to be added that a firm, dependent on its size, age, nature of resources, products and services, not only produces products and services, it also produces social identities and social roles. The dimension material – social organization addresses the coordination between the individual and the organization (Staeble). Traditional instruments for this coordination used to be selection, socialization (induction programs), identification, placing the individual in the organization according to their orientation, ambivalent, indifferent or sensitivity for upward mobility, accommodating the organization to the individual, transfer to another position or dismissal. Due to changing self-images, increased mobility on the labor market, etc. these traditional instruments for coordinating the individual and the organization, most likely need to be reconsidered.

The third dimension in Figure 7 is that of structure (*Aufbau*) versus processes (*Ablauf*). ‘Versus’ strictly speaking is wrong, because an organization always will have both. ‘Versus’ refers to the question what should have priority in organization design, structure or processes? In the twentieth century, due to high costs of information and communication, structure was prioritized over processes because most operational processes and information processing needed to be organized locally. Due to the declining costs of information and communication, in combination with the increased speed of digital communication and a virtual limitless capacity of communication, processes now are prioritized over structure. This is also facilitated by Total Quality Management, which introduced detailed process descriptions and (non-financial) performance parameters for sub-processes, subsequently used in software for e.g. workflow processes. The prioritization of processes over structure is a theme in organization design for about twenty years under the label of e.g. horizontal organizations and process management. As we will see, processes for reason of information processing need to have priority over structure.

However structure also plays a social role in organization, in terms of sub-unit identification, social roles etc. and therefore many people take comfort in structure. Add to this

that control often is organized through budgets based on structure and therefore structure is identical to the partition and attribution of decision rights and the allocation and delegation of resources. Dating back to biblical times, structure was the primary instrument in public, military and church administration and in the twentieth century in business administration. So it is understandable that structure is difficult to subordinate to processes.

Both ends of dimension structure-process enjoy a vast range of academic and managerial publications, but often unrelated. Structures can be about legal organization, the operating model, e.g. a multi-divisional organization, a functional organization, departments, as well how operational tasks are structured in terms of functions and specialized activities. Processes may be about resource allocation, decision-making and its communication, planning & coordination, socialization processes, learning & development, innovation, information processing, workflow processes, and especially production processes and to deliver services.

The organization of the firm and its organization, dependent on size, age, technology, level of innovation etc., may have up to 25 distinct aspect-structures, e.g. account management crossing the division structure (Table 1) (Strikwerda 2008).

Table 1. Overview of the different aspect structures with respect to organization design. Based on Strikwerda, 2008.

Overview of aspect structures with respect to organization:	
1.	Legal structure (ownership of shares, of resources, control, voting rights, rights to the residual claim);
2.	Finance: structuring of debt, uses of types of finance, linkage to control and incentives;
3.	Treasury-structure, e.g. international cash management as opposed to decentralized cash management;
4.	Fiscal structures, use of GSA, fiscal transfer prices;
5.	Transaction structures:
a.	Title-flow
b.	Information-flow
c.	Goods-flow
d.	Value-flow (payments)
6.	The internal administrative structure:
a.	The structure of tasks
b.	The structure of attributed decision rights
c.	The structure of the <i>jus utendis</i> on allocated resources
d.	The structure of allocated financial resources
e.	The structure of allocated non-financial resources
f.	The structure or reportable dimensions
g.	The structure of monitoring
h.	The structure of the rights with respect to selecting, appointing, appraisal, remuneration and dismissal of managers and employees
7.	The structure of strategic themes;
8.	Account-structure (account management);
9.	The structure of projects (initiatives) and program management;
10.	Geographical structures;
11.	Structure of market segments;
12.	Structure induced by products and services (cross units and departments);
13.	Delivery structures (production, logistics, after sales service, distribution);
14.	Informal, social structures, ethnical structures, demographic structures;
15.	Functional structures (accounting, management control, HR, risk management);
16.	Knowledge structures (content);
17.	Structure of information (data);
18.	Infrastructures (facilities, IT-infrastructure, etc.);
19.	Time as a dimension of business (e.g. time related consumer preferences), organization and decision making (application of the real option theory to structure investments, projects and decision making).

In simple, small firms there is a high degree of convergence of the sub-structures listed in table 1. The degree of divergence of these sub-structures depends on the size of a firm, its degree of internationalization, technology, products, markets, customer based etc. Due to the differentiation in the economy, the decreasing costs of information and communication and the need to exploit knowledge in a most efficient way, the different structures depicted in table 1 have a tendency to be less and less congruent, compared to dominant organization designs of the twentieth century.

Especially for multinationals their legal structure always has been different from their operational (product, division) structure. A typical organization for a multinational corporation

(MNC) is depicted in Figure 8. The organization form in Figure 8 is not the typical MNC matrix organization, that will be the case when the business objectives of the MNC is both pursued through regions or countries as divisions and product divisions. As depicted in Figure 8 the countries through the requirement of local incorporations, only serve as a legal infrastructure for the business.

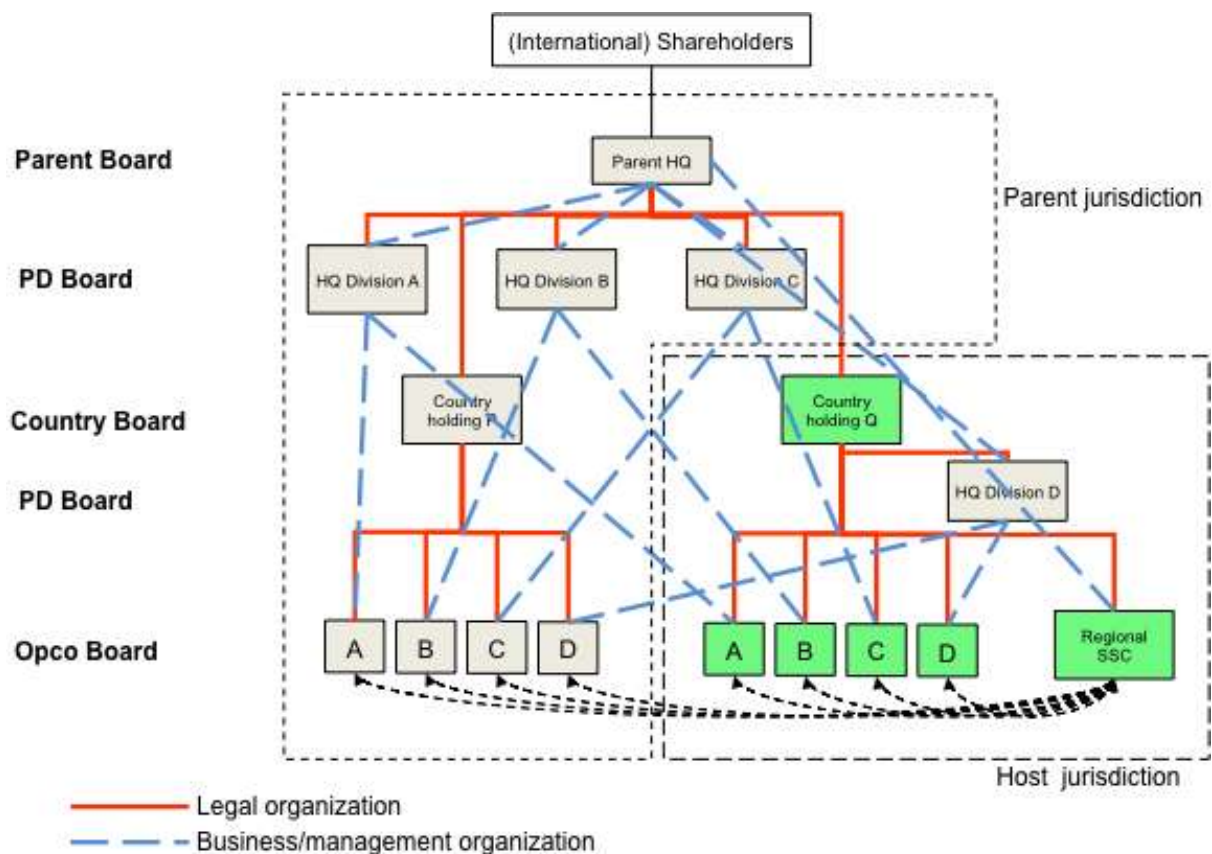


Figure 8. Typical organization of a multinational company like e.g. Philips Electronics or Cargill (Strikwerda 2009; Theisen 2000)

Since about 1990 we see a process of divergence of structures within product divisions spilling over at corporate level. Traditionally e.g. international cash management was organized as a cross division and cross-country structure at the corporate level. Contraction in the market, e.g. international retailers like the French Carrefour becoming pan-European, forced companies like Philips Electronics and Sony Europe to subdue their national sales organizations to European account management, European pricing policies and such. Also within divisions business units

have been forced, both at the seller's market and the purchasing market, to answer contraction in the market by introducing cross unit account management and cross unit purchasing to maintain negotiating power. Homogenization of products, technology and processes becoming more generic at a basic level and increased pressure by financial markets and competition to achieve higher efficiencies, in combination with decreasing costs of coordination due to ICT, forced virtually all multinational companies to introduce shared service centers (Strikwerda 2010b). The traditional vertically and functional integrated division, the hall mark of the 20th century, thus gave way to an organization form which even lacks a label, but best can be described as a multidimensional organization. That is the performance of those firms is pursued simultaneously over dimensions like customer, distribution channel, product, industry, region, country. But the difference with the traditional MNC matrix is that in this multidimensional organization the customer or logical groups of customer are the primary profit center, not the country or the product divisions, and there is no information asymmetry between any of the dimensions, whereas in the traditional MNC-matrix there is usually a debilitating information asymmetry between countries and product divisions.

The divergence in substructure also applies to the patterns of transaction between the firm and its customers. In the mobile phone industry for example the four flows comprising the transaction structure (title flow, goods flow, value flow, information flow), are organized in different ways (non-congruent), including often multiple third parties to achieve higher levels of efficiency.

An alike pattern is observable with the organization of e-commerce firms and e.g. in the case of Centraal Boekhuis in the Netherlands (Strikwerda 2008). The Centraal Boekhuis is the shared warehouse and logistic services for books for all the publishers in the Netherlands and bookstore. In the case of Centraal Boekhuis the title flow is direct from the publisher to the bookstore, but the goods flow is through Centraal Boekhuis, as is the information flow, whereas the value flow (payments) are through a subsidiary legal entity of Centraal Boekhuis.

This divergence of sub-processes, flows and structures as made possible by ICT, imply that more design parameters are becoming available and thus more options how to design an efficient organization. Due to the disembedding of information from the structure(s) as suggested in table 1, firms have the option to define multiple reportable dimensions to control their business. The latter is also pursued to avoid that the internal structure of the firm restricts its management to see, properly evaluate and to grasp market opportunities (Bazerman & Moore 2009; Levinthal & March 1993; Weick, Sutcliffe, & Obstfeld 2005).

The deployment of enterprise systems in the nineties of the twentieth century within the internal organization of the firm has identified, specified, codified and programmed up to 100-200 distinct (sub) processes within a single function like finance or HR. Each of those processes needs to be designed as well as the architecture that turns all of these processes into one efficient system. Initially processes tended to be standardized more or less on the level of architecture, due to their codification in enterprise systems. As this tended to reduce responsiveness to market differentiation and market dynamics, process standardization now tends to be restricted to the level of modules (Davenport 1998; Prencipe, Davies, & Hobday).

The increasing decoupling of aspect-structures in the organization reflects both an increase in the complexity of markets and technology as it reflects the paradigm of economics that specialization increases labor productivity, provided an efficient coordination of the specialized activities. What can be observed in a number of firms, e.g. in the financial services industry is that aspect structures (including issues like compliance, SOX, risk management, sustainability and corresponding processes) are organized as separate (staff) departments. This results in an increase of functional differentiation, but which is different from labor specialization as the traditional basis for labor productivity.

5.3 The objective function as an element in organization design

A motive for functional staff differentiation often is to improve the control of the organization: risk management, compliance, departments to implement SOX, and such. In that way this increasing functional differentiation is deployed to control the unforeseen consequences of the functional specialization as this developed in the economy of the Second Industrial Revolution. The question is whether further functional differentiation will control these unforeseen consequences of earlier functional differentiation (Beck & Lau 2005). The specialization as first described by Adam Smith was specialization of time sequential activities. Taylor's functional specialization of staff departments was to compensate for the lack of literacy of the boss with respect to planning, work methods and measurements. Taylor's model was dismissed by Fayol for being in conflict with Fayol's principle of unity of command (and thus with the French rule to be loyal to *le patron*). The same today is happening with the present staff overspecialization with respect to setting targets and compliance requirements to business units and departments, lack of unity, perhaps not as an issue of unity of command, but with respect to the unity of objectives and constraints.

This functional staff specialization may be induced by regulators, e.g. in the financial industry where regulators as in the Netherlands require a separate department of risk management, or by executives themselves. In the latter case executives want to organize attention for specific issues, compliance, sustainability, specific HR-issues, which in their view should not be diluted by other responsibilities. This staff differentiation creates new problems with respect to coordination and especially integration of knowledge, objectives and processes in the organization as a coherent *Gestalt*. Often each CSR or compliance objective/criteria is pursued by its own staff department, amongst others by setting targets or criteria to business units additional to the set (financial) performance targets as set in the resource allocation process. The integration and coordination of non-financial targets / criteria with the (financial) targets cannot be achieved by conventional tools for coordination, e.g. structure (Figure 5). To achieve

the needed coordination and integration requires the design of a multi-objective, multi-criteria *objective function* (Goodwin & Wright 2010; Kahraman 2008). The design of such an objective function is an essential element is organization design prior to the design of structure. This is often overlooked because many of the (commercial) approaches for performance measurement are too limited (one dimensional), and in traditional organization design the objective function is not acknowledged as a design issue to integrate activities and initiatives and the responsibility for designing the objective function is a responsibility of the CFO. The design of the objective function is dealt with in more detail in § 8.5, because this design is needed to understand of the concept of the information space (§ 8.4).

5.4 The role of theory in organization design

With respect to the latter, a theory of design of organizations assumes design rules. Design rules may be pre-science, based on traditions or conventions. Design rules also might be based on theoretical foundations and scientific research. Davis & Marquis conclude that: “The notion of a ‘theory of organizations’ now seems like naïve scientism like a theory of diesel trucks, or a theory of hitchhiking. Organizations simply are not the kind of thing amenable to general theory.” Davis and Marquis refer to sociological theories for organizations. The social theory of organizations focused on the human dimension of the internal organization. Some sociological theories tried to take into account the nature of technology and market, especially the contingency theories. The remarkable thing is that when the internal organization of a firm is being discussed in terms of design, or what is more common in the world of business, which model to choose, only a very few archetypes are being considered (DiMaggio & Powell 1983). Meyer (1994) observed: "There is only a loose relationship between organizational forms and practical needs and goals operating in local situations. In this sense Western organizational structures are to be seen as ritual enactments of broad-based cultural prescriptions rather than

the rational responses to concrete problems that the cultural theories purport them to be.“ This is not different in economic organization theories. Williamson (1975) simply considers the functional organization, the multi-divisional organization and the holding organization, a choice between those being dependent on transaction costs. Since transaction costs are dwindling, in the market and within organizations, due to the digital information and communication technology and due to the decreasing capital intensity of managers and workers, Williamson’s model no longer provides a guide to choose from standard organization forms. Lewin & Volberda (2003) observe that many studies focus on new organization forms within the concept of prevalent M-form and that popular business press accounts of new organization forms lack an underlying theory. Lewin & Volberda emphasize the fragmented state of the field of organization studies as do Davis & Marquis : “Organizations are simply not the kind of things susceptible to a theory, and researchers in practice have largely abandoned the notion of a theory of organizations.”

In view of design thinking being the application of abductive thinking to organization design, not straightforward applying proven concepts or best practices, the problem is not the absence of a theory of organizations, but the absence of a meta-theory, identifying the assumptions underlying existing theories in-use and thus explaining the boundaries of such theories. The special relativity theory of Einstein does not falsify Newton’s theory on the relation between force, mass and acceleration ($F = m \times a$), Einstein’s theory only tells us that at a velocity at the order of magnitude of the velocity of light, Newton’s formula no longer is valid.

According to the *Starnberger Schule* (Böhme 1978) a theory only is mature, if another theory exists which (a) validates the first theory and (b) explains the boundaries of the validity of this first theory. That is, this second theory lays bare the assumptions (implicitly) underlying the first theory. Much of theory development in organization theory is in a paradigmatic phase, that is research is guided by theoretical considerations. Research in organization theory needs to be

guided by practical problems of entrepreneurs and executives and by a continuous quest into tacit assumptions both in espoused theories and theories-in-use.

It is acknowledged in academia that organization theory lacks invariant laws as a result of a feedback loop in the relation between assumptions theories are based on, theories defining actions, actions defining operation on at least a number of these assumption and thus changing these, invalidating a number of the assumptions (Tsoukas & Knudsen 2003:15). But that is not what meta-theory in organization theory is about (Tsoukas & Knudsen 2003:6).

The lack of meta-theory has also to do with preferred research methods. Validating a theory on basis of solid empirical evidence, e.g. databases, requires time. If the time to validate a theory is the same or longer as is the time span of a feedback loop, a theory may be validated for a situation in the past, but have lost that validation for the present. This is also a flaw in the *best practice* oriented research, and why replicating *best practices* from even a recent past into the future is such a risky thing. Apart from the fact that such type of research may be limited by search paradigms. For example, Simons describes the case of IBM from his four design perspectives (Simons 2005) . Implicit he assumes structure to be a dominant factor in organization design and he observes IBM to have a matrix-type organization. In so doing he overlooks that although IBM by structure still has a traditional organization form fitting a multinational (Figure 8), but that the information within IBM is completely differently organized and that e.g. the customer is the primary profit center, not any of those structures. To see this requires management accounting as a search paradigm to discover such dimensions additional and different from traditional thinking based on structure (Strikwerda 2008). But even when using management accounting as a paradigm to study actual organizations, it requires understanding of assumptions implicitly used in management accounting to understand what is or could be different this time. The risk of using management accounting to study organization design is, that the design criteria for management accounting are projected to the total of the organization, beyond the boundaries of applicability of accounting information systems and management accounting.

In organization design the problem is not a lack of organization theory, but a wrong type of research. Too much research is aimed at replacing one theory with another by a process of falsification, whereas what is needed is not to invalidate certain organization forms, e.g. the unit organization, but to identify its limits by identifying and validating its underlying assumptions. Such type of research requires cross-cubicle research in the over specialization in academic research, itself a design problem.

So the cube in Figure 7 may be helpful to think in levels and aspects of organization, but like the four-dimensional time-space in physics, we need to add the factor time into it. Due to the feedback from the result of actions on the assumptions of the theory on which these actions were taken, a theory, be it after a long period or a short period, loses its validity precisely because it is being used for practical reasons. The effect of the feedback, how fast and how intense it will have effect on the basis of a theory depends on the nature of the theory and the subject of that theory. Theories of astronomy will not affect the physics of the universe, the effect of using theories on psychology on those theories will depend on whether those theories are more based on the neurology of the brain or on social factors. But especially theories with respect to the social, that is man's own world including organizations, are susceptible to feedback. To quote Williams James: "We live forward, but we understand backward" (Talisie & Aikin 2011:344) That is the problem of organization theory with respect to designing organizations. As a consequence, designing organizations, especially in view of abductive thinking, has an element of 'leap of faith'; "... truth in our ideas means their power to 'work' ..." (James 2005).

6 The impact of the changing institutional environment on the design of organizations

6.1 Structure, strategy and market

An important rule in organization design is *fit*. This is especially expressed in Chandler's famous dictum: 'structure follows strategy ... but the market is the common denominator ...' (Chandler 1962:382-3) (Figure 9). This suggests that in order to be successful there needs to be a fit between an organization and its environment. Not only with respect to the environment, for Roberts the design problem is to identify and select fitting arrays of choices on the many dimensions of the organization (Roberts 2004:33).

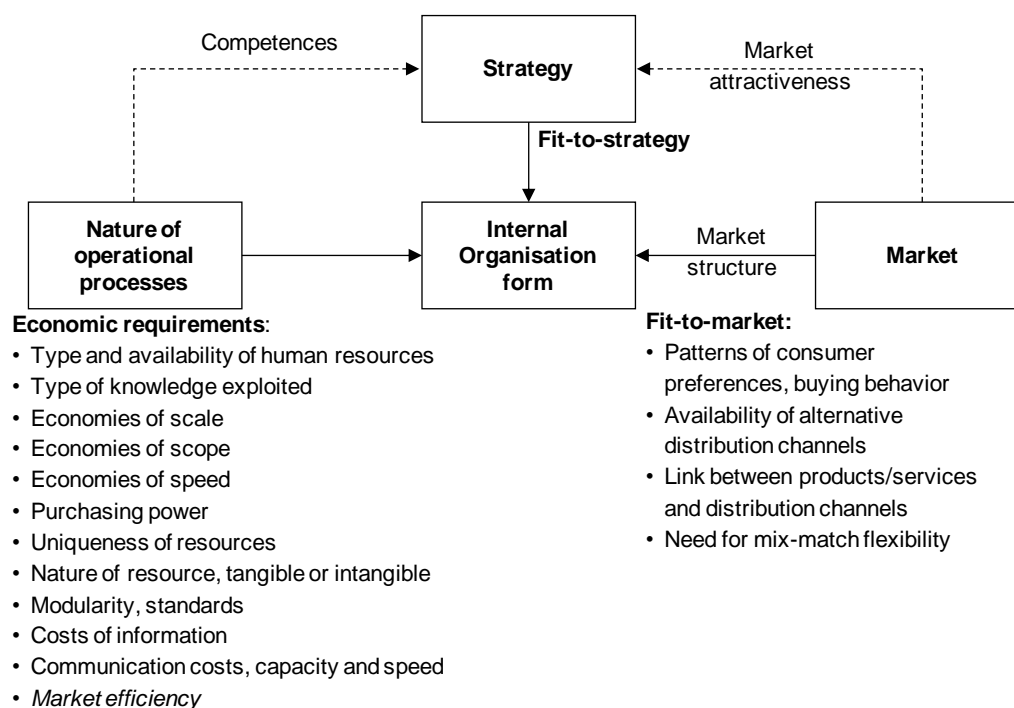


Figure 9. Chandler's dictum *structure follows strategy ... but the market is the denominator* as a design rule for the structure of the internal organization of the firm, for the 20th century.

In this section we will concentrate on the fit between an organization and its environment. Chandler's rule is consistent with the rule of sub-unit power base: that what is

most important for success of the firm in the market, should be granted the largest power in the internal organization. So in the early fifties, when manufacturing capability was most critical for success in a growing market, to achieve market share on basis of learning curves in manufacturing, e.g. within Philips, manufacturing was the most powerful function. Hence that in Figure 9 at the left hand has been entered the role of operational processes, especially their economics, in determining the organization form of firms.

When Alfred Sloan in 1920 needed to organize General Motors, Sloan did not start with defining divisions, but by defining market segments (Sloan 1962/1986). Based on these market segments Sloan defined the divisions of General Motors, being self-contained organized by all resources needed to serve the allocated market segment, after the example of DuPont in 1918 (Dale). Based on the accounting system defined by DuPont for its then new unit-organization form in 1918, the divisions were defined to be profit-investment centers. In hindsight we might say that the product-division as a profit-center was used as a proxy for the customer as a profit center. Sloan's design rule to start with the market or customer, which also can be found in Simons' *Levers of Organization Design* (2005), for a long time was obscured by the scarcity in the economy being at the left side in Figure 9. Manufacturing capability, for a long time being the scarce factor in the market, until the eighties of the twentieth century, was therefore the starting point in organization design. Alike the nineties transaction costs (market efficiency) were such that, in line with Coase theorem that transaction costs define the boundaries of the firm, firms and their divisions were vertically integrated organized. Also underlying Sloan's M-form were other economic factors, especially the costs of information and communication and the speed and capacity of communication (Stinchcombe 1990). The declining transactions costs, that is the increase of market efficiency, made possible to achieve higher efficiencies through deverticalization and business process outsourcing.

Since about 1990 the scarcity in the developed markets has shifted towards the right side in Figure 9, making the criterion of fit-to-market has become more critical for the success of the

firm (Miles & Snow 1994). Hence the programs for customer orientation, which only after 2000 would develop further into *customer centrality* as a design principle, made possible by the declining costs of information and communication.

In Figure 9 a number of design factors are suggested with respect to the organization form (operational model). The issue is not so much whether the depicted factors are a complete set of all factors, most likely not. Pugh *et al.* (1969) in their paper *The Context of Organization Structures* define far more context variables influencing the structure of the internal organization, origin and history, ownership and control, size, charter, technology, location, dependence.

The issue is more to see the *changes* in those factors, e.g. the costs of information, and what such changes imply for *new* organization designs. In a way the factors depicted should be viewed in the perspective of Figure 3. As long factors are static, e.g. by costs, these are to be situated at the level of algorithms. Designing organizations, as opposed to engineering organizations for efficiency, is about the level of mysteries in Figure 3, especially with respect to changes in those factors.

6.2 Institutions as a context for organization design

A required fit between an organization design and its environment extends beyond the market and strategy as suggested in Figure 9.

The market only functions within a specific institutional context, and thus are firms dependent on institutions. Entrepreneurial firms depend on a well designed institutional environment to be successful (Scott & Christensen 1995:xii). The various contributors of *The Invention of Enterprise* (Landes, Mokyr, & Baumol 2010) present a compelling analysis on the role of innovations in the institutional environment for the development of entrepreneurial firms as we know these for about a 150 years.

North defines: “Institutions are the humanly devised constraints that structure political, economic, and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange. Together with the standard constraints of economics they define the choice set and therefore determine transaction and production costs and hence the profitability and feasibility of engaging in economic activity. ... Institutions provide the incentive structure of an economy; as that structure evolves, it shapes the direction of economic change towards growth, stagnation, or decline” (North 1991). This institutional environment includes formal institutions, like property law, contract law, company law, monetary law, standards, but also religious institutions which have helped to induce e.g. work discipline and the acceptance of hierarchy. Not that firms waited for those institutions to develop, since the early medieval age especially merchants in a number of cases used their power to force rulers to create institutions and legislation to protect their trade and interests as a condition for growth (Greif 2006).

More in general institutions serve society to cope with the uncertainties of nature, with life itself, by providing meaning and reducing uncertainty in the social life by putting constraints on social and economic behavior. This could be in a moral way, religious way, law, regulation, education, etc. In the period Adam Smith wrote his *Wealth of Nations*, the English economy was rife with restrictive legislation and rules for trades people and craftsmen. It was also Adam Smith who argued and legitimized that when entrepreneurs would pursue their own interest therefore they would also contribute to the general interest, provided a government which would set some rules and assume a number of tasks, e.g. education (Medema).

Like the firm itself, the functioning of the internal organization of the firm, coordination and motivation, depends on a hierarchy of institutions in society (Casson 1998; Picot, Dietl, & Franck 2005:11-19). Institutions enable, constrain and reduce uncertainty and coordination is carried out within and based on a context of institutions (Casson 1998). In hindsight we might

acknowledge that in the 20th century much uncertainty (number of design parameters) in organization design have been absorbed or repressed by the institutional context of the firm. Although the neo-classical economy assumed rationality in decision-making, for all kind of reasons this neither existed nor could exist, even not in the period of modernism. Decisions in business were made (and most likely this will remain so) on basis of incomplete, inconsistent information. Although the twentieth century knows some very dark periods and multiple economic, financial and country crises (Heritier), it also produced in the western world an unprecedented growth in welfare. Technology and exploitation of scientific knowledge do to a large extent explain this growth in welfare, but not without the role of modern management and modern organization. So despite decision making on basis of incomplete information the majority of business decisions were not wrong. These decisions were made within a context of strong institutions, which explains why these decision often turned out to be right in spite of incomplete information. In a number of cases the legislator played a more active role in forcing business to make right decisions, e.g. in the electronics industry (Chandler 2001; Wu 2010) The role of the financial market in the United States in the eighties of the twentieth century is a demonstration that a force outside firms was needed to correct wrong decisions by executives (suffering e.g. the cash flow trap, satisfying behavior) to force those executives to make their firms efficient by restructuring and to spend funds on innovation (Donaldson 1994; Jensen 2001b). Alike, in view of what has happened in the period of 1990 – 2008, it can be argued that the capital market was wrong footed a number of times.

Executives, wrong or right, do make decisions in an institutional context, either in response to that context or restrained by it; decision-making is not an isolated act. Whereas Simon situates the source of bounded rationality in the individual, Etzioni situates the source of bounded rationality in the social context of the decision maker, including culture to which the individual or the decision making group belongs (Etzioni 1988).

Institutions of the era of the modernity were based on clear dualities, e.g. market *versus* hierarchy, paid work *versus* non-paid work, capital *versus* labor, etc. Since such dualities have disappeared or are becoming blurred, institutions based on such dualities lose their effectiveness if not their role (Beck & Lau 2005). Some institutions with respect to markets and firms deliberately have been weakened or removed as a result of neo-liberal thinking or market fundamentalism. Another cause of change in the institutional environment is the effect of declining costs of information and communication and the increasing speed and capacity of the latter (De Kuyper 2009; Lash 2002).

6.3 Effects of the weakening of institutions on organization design

The question to be asked is what the consequences are or will be of the weakening role of institutions in society on the design of the organization of the firm. Three different effects are to be discerned. A first set of effects is that in designing the firms and its organization the firm faces less restrictions, respectively has more design parameters available or to decide to achieve at an efficient design. A second set of effects is that the firm faces increasing uncertainties e.g. because customers, suppliers, workers and competitors have more options in the market and behavior is less regulated by institutions. A third set of effects is that, dependent on industry, regulators and others, e.g. NGO's impose additional criteria or constraints on firms and their organization.

With respect to the first set, less restrictions and a growing number of design options, can be understood by the following. Different per country, labor laws have been changed to allow for more flexibility, temp work, differentiation in labor contracts, more mobilization on the labor market etc. The increase of market efficiency, including the increase of open standards, provides more opportunities to source parts or subsystems for products from suppliers instead of producing these by the firm, to outsource business processes etc. and to enter into alliances with third parties to share knowledge and risks. For the design of a delivery system more options

are available, sometimes expressed as 'open business models' (Chesbrough 2006). Changes in the capital market in combination with increased mobility on the market for research staff has made possible the model of open innovation (Chesbrough, Vanhaverbeke, & West 2006). The declining costs of information and communication makes e.g. shared service centers possible and thus new options to organize for efficiency and improved use of knowledge, that is to exploit synergies (Strikwerda 2010c). Whereas e.g. Williamson (1985) defines a limited number of organization forms, we now can observe in addition to these new forms like e.g. platform organizations, organizations deploying shared service centers, account management, etc., but also there are more options with respect to define the boundaries of the internal organization.

With respect to the second set of effects, more uncertainty in markets, the following can be observed. Because customers have better information, wider access to markets through e-commerce and the Internet, the game of marketing having changed, and customers often have multiple sets of preferences, depending on time, place and activity context. Also customers demonstrate a higher differentiation in value preferences in preferring specific goods and brands (Holbrook). Many firms, e.g. in the retail, ICT and e.g. magazine publishing, face a higher degree of uncertainty and complexity (complexity in this case meaning the number of states, behaviors, relationships etc.). Traditional methods by firms to reduce complexity in their markets, through marketing and distribution, except for a few cases like e.g. Apple, have lost their effectiveness due to the Internet and communication technology. This higher level of uncertainty and complexity in markets or even in the overall environment (PESTLE) of the firm needs to be absorbed by the firm itself because the dynamics of this complexity has shorter time spans as the time span before investments enter their phase of diminishing returns. The traditional response by business to this dynamics of complexity was to increase the pace of innovation and shorten time-to-market cycles. This response is being applied within existing market structures and thus to organization forms like e.g. the unit organization based on the *fit-to-market* design criteria. The dynamic complexity in the market now includes the structure of the market, including a

decoupling of product and its traditional distribution channel. With respect to the design of the internal organization this implies two consequences. The first consequence is that, like e.g. in the case of Procter & Gamble, the management of market opportunities needs to be separated from the management of resources to avoid that due to a focus on return on investments in resources, market opportunities are undervalued and or are ignored in the process of governance overhang. In the traditional unit-organization the responsibility for managing (seeing) market opportunities and the responsibility for resource utilization are combined in the unit-manager. This served the firm well in traditional markets, but has found its limitations in dynamic complex markets. A second consequence of the increase of dynamic complexity in especially consumer behavior and a decoupling of product, distribution channel and market segment is, that a number of firms have found that in the design of the internal organization no longer the (product/market based) business unit by default can be assigned the status of *profit center* (Figure 4). Also in the B2B-market companies like e.g. IBM, in order to have successful global account management, no longer the country based division could be the profit center in their organization design. Retail firms like e.g. Albert Heijn needed to define formats to be the (primary) profit centers, as proxy for a specific set of consumer preferences, whereas a company like IBM needed to define the customer as the (primary) profit center in their organization design. Information on other dimensions *as-profit center* also will be available, also to reduce the risk of overlooking market opportunities and issues due to a one dimensional accounting and reporting system (Strikwerda & Stoelhorst 2009).

6.4 Institutions and to-be-in-control

The issue of increased dynamic complexity in markets also raises the question what requirements this increased dynamic complexity implies for the design of the internal organization in order to be *in-control*. Ashby's *Law of Requisite Variety* (Ashby 1956) implies that a firm is *in-control* if its internal organization has a complexity (number of states, number of actions,

number of possible responses) is at least one degree higher as that of its environment. To this should be added that the speed of changes (decision making, taking actions, adaptations, responses) also should be at least one step faster (preferably in anticipation) as is the dynamics of its environment.

In view of the increasing complexity and dynamics of the market the issues is that the required new complexity of the internal organization is difficult if not impossible to be achieved by traditional organization structure. The required complexity however can be achieved by organizing the information disembedded from the structure of the internal organization, and the speed of taking initiatives and making decisions can be increased by making this information available to all, irrespective of structure and position bound authority (Strikwerda 2008). This way of organizing information departs from the traditional design rule in information management and IT-governance (especially Venkatraman's *business-IT alignment paradigm*) which implies that information needs to be structured according to and within the structure of the internal organization.

The third set of effects is about the regulatory dimensions in the institutional environment of the firm, but should include the business institutions as well (the functional fields of HR, accounting, management control, IT, etc. and their paradigms, prescriptive models, text books, training and certification programs).

E.g. the Dutch Corporate Governance Code implicitly is based on characteristics of the economy and firms as typical for the economy of the second industrial revolution. That is, it is based on the traditional neo-classical separation of capital and labor as a consequence of which workers are no part of the firm, they are a purchased commodity. Whereas in the modern firm the knowledge workers is, through human capital, part of the information base that defines the value of the firm (Arrow 1996). Neither this corporate governance code does take into account that through e.g. modularization organizations can be designed so that uncertainty can be absorbed (Baldwin & Clark 2002b). The Dutch Corporate Governance Code points out various

aspects of the internal organization the supervisory board should monitor, but with respect to information it is only about information as needed for the annual report. With that the code stresses accounting profit over economic profit, whereas the interests of the shareholder are with the latter. The code assumes that the task of the executive board is to create shareholder value in the long term, whereas as a result of the role of intangible assets shareholder value no longer is equal to neither the value of a firm nor the value it creates. As a result a large number (about 120) of detailed requirements are set (*best practices*) e.g. with respect to risk management. The idea of setting requirements to risk management is a result of a society which has lost its confidence in science and technology to reduce risks, and instead sees these as sources of risks (Beck & Lau 2005). Risk management is focused on identifying risk events and no or little attention is paid to what elements, processes etc. cause risks (Malhotra & Bazerman 2005). Whereas an organization should be designed to mitigate risks and to absorb uncertainty.

Audit frameworks like COSO ERM (used by operational auditors to audit for *in-control* statements) and COBIT 4.1 (a framework defined and used by EDP-auditors) are based on organizational practices which were common and valid in the twentieth century. These frameworks are typically defined at the level of codes (Figure 3), whereas to be *in-control* in a changing environment requires identifying new design criteria. In the case of COBIT 4.1 this framework suggest that data standardization is to be left to the IT-department, suggesting data standardization is a technical issue. But in a world of open business models, of the firm as a nexus of contracts, in which contract management has become an essential function, data standardization is an issue of law and contract theory and as much an element of organization design.

Textbooks in the field of management control (Anthony & Govindarajan 1995; Merchant & Van der Stede 2003) by default assume the unit-organization and a system of profit centers and costs centers (Figure 4). These textbooks do not pay attention to the present need of multidimensional accounting systems. Textbooks on performance management (Simons 2000)

assume one-dimensional objective functions. Textbooks on management accounting (Vaassen, Meuwissen, & Schelleman 2009) still assume a non-resource role of information. Some textbooks on corporate finance (Grinblatt & Titman 2002) assume the M-form for the firm due to the concept of portfolio management of corporate finance, whereas modern firms are economically integrated, that is these are not a portfolio of self contained investment projects (Palmisano 2006). Also textbooks on organizational behavior (Greenberg & Baron 2003; Rollinson & Broadfield 2002) assume traditional organization forms. Textbooks on strategy, most of which are running a chapter on organization design (Grant 2002; Johnson, Scholes, & Whittington 2005), assume traditional organization models. Textbooks on information technology (Applegate, Austin, & McFarlan 2006; Weill & Ross 2004) still are based on the business-IT-alignment paradigm (Although Weill and Ross also have published on e-business models (Weill & Vitale 2001)). Academics writing textbooks and their publishers, due to the franchising model to exploit textbooks, are slow compared to innovative firms with respect to their organization, to include new insights and new developments in their textbooks (except for some popular, non-systemic elements like team-work).

When it is about factors influencing or determining the actual choice of new organization form, or the design of organization forms, these factors might be summarized as in Figure 10.

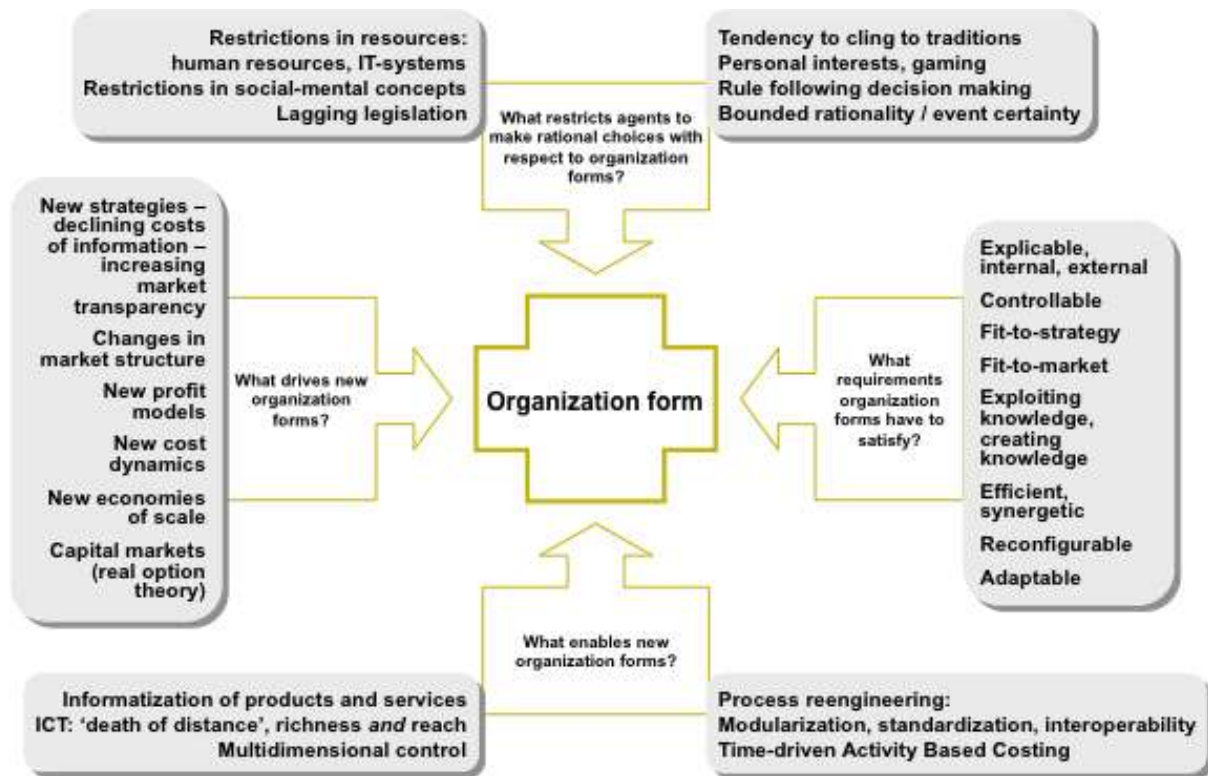


Figure 10. Factors that influence the design and deployment of new organization forms.

Design is about applying abductive reasoning on the design of organizations. The role of the institutional environment, both as enabler and restrictor, implies that this abductive thinking, at least partly, needs to be fed by observations on changes in this institutional environment. Also, it might be that elements of this institutional environment need to be part of the design effort (e.g. by lobbying with legislators) to make new business models or new organizations possible as e.g. in the case of flex-work by temp firms.

The role of changes in the institutional environment also suggest that design thinking not so much is about which factors determine organization forms, as e.g. in Chandler's *fit-to-market*, but that design thinking is about identifying which are the underlying assumptions, e.g. the role of costs of information in the unit-organization, and which of these are changing, thus offering new design parameters, which theretofore needed to be dealt with as restrictions in organization design.

7 Implications of the changing nature of the firm on organization design

7.1 The modern business enterprise as context for organization design

A specific institutional context of organization design is the concept of the modern business enterprise (Chandler 1977; Rajan & Zingales 2000). With the advent of the second industrial revolution a new organization form for businesses emerged: the *modern business enterprise* (MBE). This new organization form first and foremost was a legal invention: the creation of the corporation as a legal fiction, which separated private capital from the capital of the firm, but also separated ownership and management (at least in the US jurisdiction; e.g. according to Dutch corporate law shareholders are only owners of their share which entitles them to certain rights; a corporation in the Dutch jurisdiction “is owned by itself”). It is within the institutional context of the MBE that the main body of the 21st century organization theory did develop, including approaches for organization design.

The concept of the MBE was based on a number of distinct institutional arrangements (Coase 1937; Putterman & Kroszner 1996; Williamson, Winter, & Coase 1991). These institutional arrangements are challenged or even negated, by the characteristics of the economy of the 21st century (Rajan & Zingales 2000) (§ 7.2). Each of those arrangements has specific consequences or restrictions with respect to the internal organization of the firm. These arrangements, by technology, nature of assets, relative costs of inputs, nature of the value creation processes, the roles of management and workers, and markets, reflect the historical period in which the MBE was conceived, in the last quarter of the nineteenth century. If judged by the tremendous growth of economic welfare in the western economies in the twentieth century, the MBE can be said to have been a successful invention. With its success it appears that the MBE has become something of an institution in the economy: many are not aware of its

effects and its relativeness. Williamson in his *The Economic Institutions of Capitalism* makes no explicit reference to the MBE, although he mentions a number of its elements (Williamson 1985:2-7). Institutions by nature, and success by reification, are containers and carriers of basic assumptions for academic theorizing, legal rules, informal rules, professional roles and decision-making by practitioners.

Williamson (2000) defines four levels of social analysis which are helpful to understand the changing context of organization design. The first, top level is the level of social embeddedness. This is the level where norms, customs, mores, traditions are located. Its symbols are religion and culture. Williamson suggests that this level by most institutional economist is taken as given and only changes over hundreds of years. Others suggest that this level is influenced by materialism, by a media culture and perhaps more deliberately by the ideology of neo-liberalism (Kay 2009). The second level of social analysis is that of the institutional environment. This is the level, based on the first level, of formal rules, constitutions, laws, and property rights. It also includes the executive, legislative, judicial and bureaucratic functions of government amongst others to enforce property rights and contracts. At this level the private enterprise (MBE) is made possible. Changes at this level perhaps are once in hundred years, the change of property law, the creation of corporate law and labor law at the end of the nineteenth century being the last major change in our institutions. The digital technology now questions (Digital Rights Management) the property law of music and other productions that can be distributed and enjoyed on basis of digital technology. As well that the declining costs of information individualize ownership and entitlement. The third level of Williamson's social analysis is that of governance systems of firms. Governance systems, given the incomplete contracts between shareholders and the firm, serves to align the ex ante incentives with the ex post distribution of the residual claim, and constraining the discretion of executives by correcting specific decisions of executives by the general meeting prior to execution. The system of corporate governance separates management rights from control rights by allocating the rights of

initiation and implementation to executives and the rights of ratification and monitoring, including the right to dismiss executives, to the supervisory boards (non-executives) (Fama & Jensen 1998 (org. 1983)). Williamson's fourth level is the level of the firm as production function. This is the level of getting the marginal conditions right (adaptation) of resource allocation, setting prices, quantities and incentives in the organization. Williamson is not explicit on what level, that of governance or that of the firm (the fourth level) is the business model or economic model of the firm. But if Williamson suggests that governance also is about aligning governance structure with transactions, and that the law stipulates that in case of a major change of identity of the firm the consent of the general shareholder meeting is required, this suggest that the business model is interwoven with the governance model at the third level.

Williamson suggests that the higher level sets constraints to the lower level but that there is a weaker feedback from the lower level to the higher level. Beck & Lau (2005) suggest that due to new conditions at the fourth level, higher consumption, materialism, media culture, a shift from a reflective society to a reflexive society, there is a strong, eroding force, direct from the fourth level to the first level. This in its turns questions the foundation of the institutional environment at the third level and with that the strength of the MBE as an institutional environment for the organization of the firm.

In view of technological changes, demographic changes, changes in markets, the declining costs of information and communication we therefore should task ourselves to scrutinize each of the defining basic assumptions of the concept of the MBE for validity and relevance in the 21st century, and subsequently for its impact on designing organizations.

7.2 Characteristics of the modern business enterprise

A first characteristic of the MBE is that it is shaped by law (Zingales 2000). Before about 1850 firms either were personal undertakings, with no separation between private capital and the capital of the firm, or partnerships (dating back to the early medieval period) or companies were chartered by the King, e.g. the Hudson Bay Company. By defining the corporation as a legal persona, lawmakers made it possible for any entrepreneur to incorporate his firm as a legal persona, separating private capital from the capital belonging to the firm. This invention of the law served the need for capital accumulation as needed by the then new technologies, thus facilitating the creation of large firms, also because this new legal persona itself could own shares and therefore control other firms. With this new type of incorporation the MBE can sue other parties and it can be sued. Even, the MBE can sue its own managers e.g. for negligence of their fiduciary duties or violating their duty of loyalty. This new incorporation also served the continuity of the firm, independent of the continuity of its managers or financiers. Through the incorporation of the firm in an institutionally conceived corporation, with its own rights vis-à-vis its shareholders, shareholders only have limited liability, they are not responsible for corporate liability. In turn shareholders are supposed not to intermingle with the internal policies, arrangements and workings and thus not to be involved with the internal organization of the firm: this is the exclusive prerogative realm of the management (Executive Board) of the firm/corporation. It is not to be expected that the incorporation of the firm will be fundamental different in the 21st century. There may be some shifts towards e.g. cooperatives, the composition of shareholders may change, e.g. through employee shareholder ownership programs.

A second characteristic of the MBE is that it is well defined by the ownership of physical assets, buildings, land, equipment, tools and patents. Also the MBE is (physical) asset intensive.

The legal boundaries of the corporation can be drawn around these assets and these boundaries coincide with the economic boundaries of the firm. This second characteristic is already different for multiple firms. Through deverticalization, outsourcing, or just being an orchestrating firm in a network, a firm not necessarily needs to be defined by its (physical assets). Through the phenomenon of e.g. complementary products and the network industries (Shy) the economic boundaries of the firm no longer necessarily coincide with its legal boundaries. This divergence between the legal boundaries and the economic system of the firm implies that firms have to design for how to appropriate the value from the market. Also it is acknowledged that firms create shared value in cooperation with their customers, suppliers, shareholders, public infrastructures, the educational system etc. This implies a design issue: how to distribute equitable created value to all those who have contributed to this created value. Preferably this design informs those involved ex ante how ex post shared value will be distributed, creating an incentive to maximize their effort.

A third characteristic of the MBE is that the control rights on the firm, as well the authority of the management to issue instructions to workers is based on ownership of the (physical) assets of the firm (legally the corporation in which the firm is incorporated). Also the partition and attribution of decision rights within the firm is based on the corporation being the owner of the assets. Control by the management in its fiduciary duty to the MBE-type firm, is based on a partial application of Roman property rights, in which the right to use an asset (*ius utendi*) can and will be attributed to a worker, whilst the right on the profit generated by an asset and its capital gain (*ius fruendi*) will remain with the corporation, alike the right to alienate or destroy an asset (*ius abutendi*) (Furubotn & Richter 2000:77). Because in the traditional MBE assets are physical the corporation has complete control over the *ius abutendi* of its assets. Since the increase of creative knowledge workers, which own uncoded knowledge, which is critical for the performance of the firm, firms see themselves faced with a dependency on specific assets

on which the firm has no alienation rights. Not only sets this new requirements to designing a control system, the working of the internal hierarchy and coordination, it also requires designing new reward systems and possible the design of new type of labor contracts. Uncodified personal knowledge is inputted in the production system through interaction between creative knowledge workers, not through transactions, which requires new systems for measuring and tracking contributions of individual workers and teams to the performance of the firm.

A fourth characteristic of the MBE is that tacit knowledge (Weber's *Fachwissen*) or personal knowledge of workers is acknowledged as being of importance to the economics of the firm (Barnard 1948:291). Also it is acknowledged that personal knowledge is the property of the individual worker. But workers are controlled to use this property for rent extraction or to appropriate a part of the residual claim by the MBE applying idiosyncratic work methods, tools and systems. In this way the contribution of capital and labor in the MBE organized firm is strictly separated. The creative knowledge worker has become part of the knowledge base of the firm (Arrow) and no longer is or should be viewed as a purchased commodity as assumed in the neo-classical economy theory. This may have implications for the reward system, especially to create incentives that those creative knowledge workers will invest in their knowledge, because in the case of a mobile labor market the employer may be hesitant to invest in creative knowledge workers. The phenomenon of firms being dependent on the knowledge and skills of creative knowledge workers may also have consequences for the system of corporate governance, as knowledge workers increasingly understand how to appropriate value from their knowledge, e.g. by demanding and getting bonuses, as in the case of deal makers.

A fifth characteristic of the MBE is that it is vertically and functionally integrated. It is assumed that the value creation process of the MBE takes place within the jurisdiction of its corporation. So most of the transactions involved in a production process, matching of available

investment funds with market opportunities, matching supply and demand, are decided through a resource allocation process based on hierarchical decisions and fiat, not through prices. A consequence of the integrated MBE is that transactions with suppliers and customers are through arms length complete contracts. Contracts with workers are incomplete contracts in which implicit and explicit a “zone of acceptance” is defined within which an employee is expected to accept orders of the management, providing management the authority to issue orders (Simon 1991). Related to this is that workers accept a somewhat lower but more certain pecuniary reward (besides rewards in terms of making a promotion), compared to being self-employed. Both the incomplete contract and the somewhat lower but more certain payments are accepted because both employer and employee find it difficult and costly to renegotiate frequently their contracts. Due to the increase of temp workers the flexibility of the firm has shifted from incomplete labor contracts to a temporarily workforce. Related to the incomplete labor contract was the phenomenon of identification, that workers could identify with the products, markets, mission, the values of the firm. On basis of that the management of the firm could rely on a high degree of self-coordination, reducing the costs of coordination by hierarchy. This self-coordination include taking initiatives as needed for the development and adaptability of the firm. The reduction of a fixed core of life time workers who identified with the firm, being loyal to the firm, and working with a continuously changing part of the workforce, requires firm to be more explicit on values, on quality of products and services, and forces firm to rethink how to be flexible in terms of new ideas, improvements etc. beyond the capacity flexibility.

A sixth characteristic of the MBE is tight command-and-control to achieve efficiency in absence of an efficiency enforced by the market mechanism in the internal organization. Or, more precisely, because of the separation of capital and labor, and the partial application of the Roman property law, in the internal organization of the MBE no co-location exists between decision rights with the rights to their capital value and thus there is a lack of incentives to use

those decision rights efficiently (Jensen 1998:111). To compensate for this lack of co-location of decision rights and their capital value, various types of control, amongst other job descriptions, performance measurement, job grading systems, performance evaluations etc. are needed in the internal organization. Hence the system of management control in the MBE (Anthony & Govindarajan 1995; Merchant & Van der Stede 2003). This tight command-and-control included double loop control through staff departments and included both financial and non-financial information. This tight command-and-control system in the MBE was based on physical assets (Zingales 2000) and general knowledge, that is knowledge that is inexpensive to transmit (Jensen 1998:103). Also, this tight command-and-control system is designed as a centralized, hierarchical system of line budgets, prohibiting the budget owner to substitute funds between alternative opportunities, e.g. between HR, IT or equipment. In the MBE, in addition to the lack of co-location between decision rights and the right to their capital value no co-location exists between decision rights and the knowledge important to those decisions (Jensen 1998:104). The MBE therefore is characterized therefore with two types of information asymmetry. The first information asymmetry is that management knows better which of the alternative decisions by workers lower in the organization contributes most to the overall performance of the firm, also because management has overview over externalities of those decisions and over opportunities. The second information asymmetry is that workers know more about their tasks, how to performance these efficiently, as does management as a consequence of non-zero costs of monitoring effort and performance information. In the MBE these information asymmetries are solved by a system of costs centers, revenue centers, expense centers and profit centers, dependent on the nature of the information asymmetry between management and workers (Brickley, Smith, & Zimmerman 2001:433). In the MBE it is assumed that workers depend on the employer for their income, identify with the goals, values and products of the firm (Simon 1991), have little mobility on the labor market, are loyal to the organization and trust the hierarchy (Deal & Kennedy 1982). As a result of which the agency loss in the internal

organization is contained (Pratt & Zeckhauser 1991). For reasons explained before, the traditional systems for management control have lost their effectiveness. It took some time to understand the true cause of this. A first response to restore control was by culture programs, next were structured control techniques like cockpits, dashboards etc. To no avail. Now firms need to have control based on loosely coupling in order to be adaptive (Simon ; Simon), which needs to be compensated, compared with the old system of tight control, by using more deliberately elements like a clear mission statement, a hierarchy of values, an explicit and communicated business model, the deployment of multi-criteria, multi-objective objective functions and direct access to all available information. The latter implies that firms redesign the organization of information to reduce information asymmetry. This is pursued in order that more workers for themselves can interpret data and come up with new initiatives, but absence of information asymmetry also creates a kind of panoptic control, horizontal and vertical, including with the possibility to analyze real time where the cause of problems resides.

A seventh characteristic of the MBE is that the agency costs predominantly exist between the shareholders and the management of the firm. Because managers are not the residual claimants on their decisions, shareholders are, corporate governance focuses on system for decision control in which control rights are separated from rights over decisions (Fama & Jensen 1998 (org. 1983)). Zingales (2000): “Thus transparency, accountability of directors, contestability of corporate control, and managerial compensation aligned with shareholder wealth maximization became steps in this battle.” Corporate governance was an issue with respect to the MBE, witness Berle & Means writings. But not so that shareholders granted discretionary power over the cash flow of the firm to its management, the cash flow ‘belonged’ to insiders, in the sense that the management could and would use it to grow the firm. Rajan & Zingales (2001): “In the past [that is in the MBE], the complementarity between inside financial capital and human capital held the firm and its growth together. Owners [shareholders] were

happy to let insiders use the funds generated by existing assets to finance new investments because this secured them property rights on growth opportunities. Insiders were happy to exercise these options within the legal framework of the existing firm, because their career and earnings potential was enhanced and, lacking financing, they could not have done it on their own.” The mobility on the labor market, in combination with available venture capital, made many scientist walk away from their employer, taking with them ideas about new products and creating their own business (Bhidé 2000). This forced firms to redesign their innovation processes, resulting in the concept of open innovation (Chesbrough, Vanhaverbeke, & West 2006).

So it can be concluded that the nature of the firm changes, especially also at an institutional level, that is with respect to ownership of assets, basis of control, its economic boundaries, labor contracts, etc.

7.3 Implications for organization design?

What are implications of the changing nature of the firm for organization design? Below we list a number of identified consequences without claiming to be complete.

A first consequence of the changing nature of the firm for designing its organization is with respect to who is involved in designing the internal organization of the firm, and who is or will be the judge of the design, respectively the performance of the organization. Although firms in their incorporation remain to be shaped by law, the institutionally understood corporation is challenged by the idea of the firm to be a nexus of contracts. Especially for private equity shareholders the corporation and its firm less is an institution being run by its management as a going concern pursuing its own interests. Such shareholders perceive the firm as an instrument to serve shareholder interests. In its turn this attitude is challenged for reasons of social capital, but also some question why shareholders should be better decision makers as managers (executives) can be (Boot & Cools 2007). The issue is that the CEO since about 1990 is losing

power to shareholders and to members in the organization. The CEO as Chandler's visible hand of the MBE has become a vanishing hand (Langlois 2002). As a result shareholders do interfere in the internal organization, e.g. by restructuring debt at the level of division or business units and designing incentive systems with a high sensitivity to performance (Jensen 2004).

A second consequence of the changing nature of the firm follows from the role of intangible assets. Intangible assets are to be understood in two ways. The first definition is that defined as in the accounting standard IASB-IAS 38. In this definition the four critical attributes of intangible assets are: 1. Identifiability (to be separable from goodwill), 2. Control (the power to obtain benefits from the asset), 3. Future economic benefits (such as revenues or reduced future costs), 4. The costs of the intangible can be measured reliably. In the accounting view intangible assets are fully controlled by the corporation in terms of alienation (identifiable property rights, e.g. patents) and the power to obtain benefits from the asset. The accounting view on intangible assets leaves intact that the firm is well defined by the ownership of its assets.

In the resource view on intangible assets (Jensen 1998; Zingales 2000), especially human capital, this is attributed the following characteristics:

1. It is uncodified and difficult to codify
2. It is personal and difficult and costly to transfer to other persons
3. It is inputted in the production function through interaction, not through transaction
4. No direct transferable property rights exists, it is property of the person
5. It is critical for the operations and innovation of the firm
6. Its value increases with successful applications, but usually combination is required with other tacit knowledge
7. It develops with application to *de novo* problems

Intangible assets: human capital, organization capital and information capital

What precisely is human capital, organization capital and information capital? These three types of capital are defined in national statistics (van Ark, Hao, & Hulten 2009; van Rooijen-Horsten, van den Bergen, & Tanriseven 2008). Investments in human capital are measured expenses on training, management development and other types of education of workers. Investment in organization capital is defined by expenses on management consultants e.g. to design new structures. Investments in information capital are measured by investments in hardware and software. These three types of investments in themselves do not define the value of intangible assets. Brynjolfsson *et al.* (Brynjolfsson, Hitt, & Kim 2011) argue that this value only is being created when these three types of intangible assets are organization complementarily and co-specialized (Figure 11).

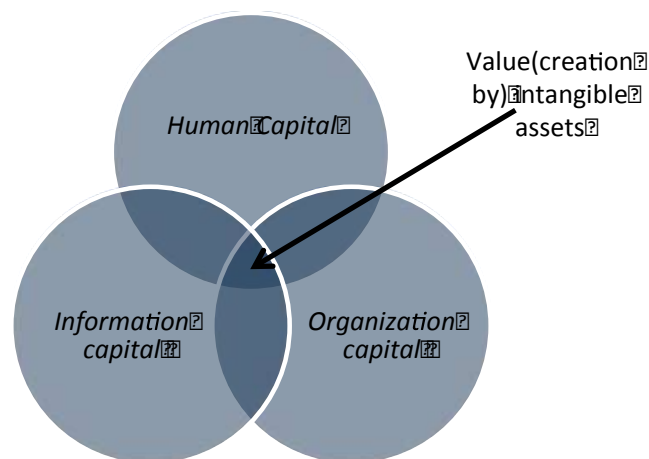


Figure 11. Intangible assets have/create value only through complementarity and co-specialization.

Kaplan & Norton (2004:211): “The value of intangible assets comes from how well they align to the strategic priorities of the enterprise, not by how much it costs to create them or how much they are worth on a freestanding basis.” Kaplan & Norton in their method implied by their concept of the strategy map to design organization operationalize *human capital* in the parameters *knowledge, skills* and *values* (2004:232). Each set of these to be based on strategic job families

which in their turn are to be based on strategic processes needed to perform the customer value proposition.

Kaplan & Norton (2004:251) define information capital to exist in four categories of IT-applications: transformational applications, analytic applications, technology infrastructure and transaction processing applications. This is a break with the business-IT-alignment paradigm because Kaplan & Norton acknowledge that information, through the Internet, social media etc. also changes the strategic and operational environment of the firm and therefore is an input in designing the strategy respectively the business model of a firm. Despite this improvement Kaplan & Norton's definition of information capital is limited, because it does not take into account e.g. information as a resource, an input in the production function, nor do they address the issue of information superiority (see § 8) (Strikwerda 2011).

Kaplan & Norton (2004:277) define organization capital to be built upon four components:

1. *Culture*: Awareness and internalization of the mission, vision, and core values needed to execute the strategy
2. *Leadership*: Availability of qualified leaders at all levels to mobilize the organization toward its strategy
3. *Alignment*: Individual, team, and departmental goals and incentives linked to attainment of strategic objectives
4. *Teamwork*: Knowledge with strategic potential shared throughout the organization.

In themselves these components are not wrong, but as we will see in § 8.6 and § 9 there is more to be said to what defines organization capital. But notice in the components listed by Kaplan & Norton that organizational structure is not one of the components of organization capital.

At this moment only a coarse method exists to calculate in monetary terms the value of intangible assets: Tobin's q , the quotient of the market value of the firm to its book value (Due to the IASB accounting rules investments in human capital and organization capital must be expensed, only investments in IT-hardware and software can be capitalized). If Tobin's $q > 1$, as

is the case for many firms, then there is positive monetary value in the firm's intangible assets. However this method to measure the value of intangible assets is too coarse to be helpful in making investment decision within the firm how much to invest in specific intangible assets.

The resource based view of the firm applied to intangible assets implies that the internal organization needs to be set up for exploiting synergies, because of their complementarity. Another consequence of the resource view on intangible assets is that the firm, e.g. in the case of professional service firms, engineering firms, advertising bureaus, no longer is defined by the ownership on assets critical for its economic system. This has implications for the design of incentive systems.

Due to phenomena like co-creation (applying existing knowledge to first-time new problems of customers) between the firm and its customers and suppliers (Prahalad & Ramaswamy 2004), de-verticalization, horizontal competing (Yoffie 1997), network industries (Shy 2001), (business process) outsourcing, alliances and joint-ventures, value creation with respect to a product or service increasingly no longer takes place within the boundaries of a single firm (Porter & Kramer 2011). Value may be created in co-creation with customers (as in the case of mix-match flexibility based market strategy of Dell), implying that the firm has no control over an asset being material for its economic system, specific customer knowledge. Value may be created in the market, in the case of a network industry (Shy 2001), as e.g. in the home entertainment industry or construction industry, making value appropriation a serious design issue.

At least four consequences follow from the role of intangible assets and their nature with respect to (the design of) the internal organization:

- i. The capital market has responded to the increasing role of intangible assets, by emphasizing economic profit, detrimental to the accounting profit of the MBE, which has

- consequences for the design of the objective function and for the design of management information;
- ii. In the design of the internal organization intangible assets imply an emphasis of value creating processes over the structure (configuration) of resources. Due to their nature, intangible assets require the exploitation of cross division synergies to have highest rents on their investments. This makes structure less critical in the design, provided the information and decision making processes are designed and organized disembedded from structure;
 - iii. To have control over an economic system beyond the legal boundaries of its corporation, firms need to define an architecture for their value proposition, control critical standards and need to control critical modules (subsystems of their product or service) (Chesbrough 2003). This subjects the design of the architecture of the organization of the firm, including that of processes, to the design of the architecture of the customer value proposition and the design of the external organization to achieve market power;
 - iv. As new knowledge is created by applying existing knowledge and capabilities to de novo customer problems, no longer the long term investments can be separated by resources from short term operations. Increasingly front line workers, professional workers have to allocate their time over the short term earnings and long term investments. This is solved by introducing in the budgeting system the expense category STRATEX (Kaplan & Norton 2008), that is to say this proliferation of the place of knowledge creation requires a change in the design of the accounting system of the organization.

A third consequence of the changing nature of the firm is with respect to the control function within the firm. The control of the traditional firm was based on ownership of physical assets, especially control over rights of alienation, is impaired by the growth of uncodified, personal knowledge as described before. The right of management to issue orders to employees

was thought to be based on the corporation being the owner of the assets the worker used. A second source of authority to issue orders by management to workers, the incomplete labor contract (Simon 1991) is dwindling, due to the growth of temp workers, employment of consultants, interim managers and others on basis of what basically is a suppliers contract. Also it turns out that control in the MBE implicitly was based on general knowledge (which is easy to transfer), whereas as a result of TQM, customization, knowledge work, services much of the knowledge is of a specific nature, which is difficult to transfer. As a result traditional techniques for management control did lose their effectiveness (these were not designed to process large amounts of detailed information, apart from the costs of information and communication). Within the concept of the MBE, in which ownership of assets was not a design variable of the internal organization, an initial response to this decline was to shift to culture (symbolic) control (Deal & Kennedy 1982; Schein 2000). Through the concept of knowledge management (systems) it has been tried to codify tacit, personal knowledge to regain control by the firm over tacit knowledge. This has not been really a success, as workers sensed or, as in the case of deal makers in the financial services industry, understood explicitly, what value there is to their personal knowledge (Wilhelm & Downing 2001). The impairment of the control over the firm by the growth of tacit knowledge of key workers is acknowledged by the capital market, e.g. by investors willing to pay retention bonuses to key staff in case of a takeover. With respect to the design of the internal organization the design of effective control systems still is an issue. Mechanical, tight control system may impair the capacity of the firm for adaptation to changes in its environment (Simons 2005). Control systems based on trial-and-error plus fast feedback are gaining terrain, but control losses are not always appreciated by supervisors nor regulators. There seems to be a shift going on, in order to be in-control in dynamic, complex environments, from management by objectives to management by values (Dolan & García Sánchez 2000). From a perspective of cybernetic information theory this is a logical development. The performance of a company like Johnson & Johnson, which since 1943 has applied a clear and consistent hierarchy

of values, proves the value of a clear and consistent hierarchy of values to result in efficient decisions in times of turbulence compared to peers without such a hierarchy (Collins & Porras 1994). However, it must be noted that management by values is based on a broad availability of data, respectively information.

A fourth consequence following from the changing nature of the firm is with respect to designing a context that attracts, retains and develops *creative knowledge workers*. As tacit knowledge no longer can be controlled by idiosyncratic work methods, tools or systems (due to open standards, ISO and DIN-standards, generic tools like desktop software applications, professionalization of staff), the modern firm needs to offer creative knowledge workers specific conditions to attract and to retain them. Apart from valuing their personal knowledge, by a premium contract wage usually in combination with a bonus, the firm has to offer opportunities for the creative knowledge worker which by this worker as being the best to put his or her knowledge to be productive and to increase in value. Creative knowledge workers strive for a large as possible personal market (Rosen 2004). Creative knowledge workers may pursue their personal market in the open market, but this has disadvantages as well, especially uncertainty and risks. So creative knowledge workers, dependent on personal characteristics, nature of work, age, etc., in general will seek a tradeoff between what a firm has to offer and what the open market has to offer in terms of a preferred revenue/risk profile. A specific consequence for the internal organization seems to be that firms have to offer creative knowledge workers the opportunity, information and discretion to decide for themselves in which projects their knowledge will produce highest value for the firm, for themselves and will increase the knowledge. That is, a shift from physical assets to personal knowledge as critical assets for the firm, implies that the resource allocation process in the internal organization (Bower 1986) needs to be redesigned into a system of resource mobilization (Doz 2005).

A fifth consequence of the changing nature of the firm is a redesign of contracts with various partners of the firm. The 21st firm no longer is vertically nor functionally integrated, due to de-verticalization, outsourcing and business process outsourcing. Outsourcing contracts exists in various types and nature (Quinn & Hilmer 1994), but these are distinctive from traditional supplier contracts that outsourcing contracts are incomplete contracts, usually including a forbearance clause, and subsequently the outsourcing relation is basically an alliance (Gomes-Casseres 1996; Robinson 2001). We see a change or even reversal in types of contracts written. In the MBE the employment contract was an incomplete contract, whereas the contract with suppliers and customers were arms length complete contracts. Through co-creation and forbearance clauses with suppliers and sometimes with customers, and with parties to which activities and processes are outsourced, incomplete contracts are written. Whereas workers, either through project management, consulting contracts etc. tend to change to various (temporary) complete (supplier) contracts. New business designs also have the title flow on goods processed and delivered as a design variable, e.g. in the case of the Centraal Boekhuis in the Netherlands or in the case of eBay (Tapscott, Ticoll, & Lowy). The NBE assumed a closed model for development and innovation. Basically capabilities available or to be developed within the firm would be used in projects. If a project either completely or partly produced products or services not fitting with the firm, these simply would be abandoned and its investment written of. As a result the initial value of projects on basis of NPV would be low and thus market opportunities would be valued to be low. The changing market of venture capital, the lower costs of defining ownership rights on ideas, improved methods to value new ideas, has turned a number of firm to change to the model of open innovation (Chesbrough, Vanhaverbeke, & West 2006). That is that a project is structured on basis of real options, and that during a project the market will be scanned for opportunities outside the to be integrated in the project, whilst results from the project that will not be of use for the firm, as much as possible will be spun off to benefit the firm with at least some return on it. As a result contracting, the design of types of

contracting, structuring contracts through e.g. real options, and subsequent the factoring of decision making becomes a design variable in the organization of the 21st century.

A sixth consequence of the changing nature of the firm is with respect to the design of the organization of information, and the processes of sensing and sensemaking. In the traditional design of the organization of the firm neither the function of sensing nor that of sensemaking used to be an explicit design variable. Implicit it was acknowledged especially in the context of social processes (Weick 1995). Firms today have to adapt continuously to changes in the market, technology, labor markets, changes in the political environment, etc. This adaptation requires a high capacity of information processing: sensing, sense-making, decision making, etc. In the MBE the adaptation of the firm to changes in its environment predominantly were centralized management decisions. Already Von Hayek in 1945 (Hayek 1945) pointed out that firms would need to decentralize their information and decision making to achieve a needed capability for adaptation. The initial type of command of the MBE, *management by instruction* because this system could not deal with large amounts of information, in the seventies was replaced by *management by objectives*, mainly by deploying Sloan's M-form. Sloan M-form of the organization, its division, not only was based on General Motors market segments, but also on the then high costs of information and communication, low speed of communication and its limited capacity. For DuPont and Sloan information asymmetry was a key concern in defining what information should be reported and which information should be processed locally (Stinchcombe 1990). To make decentralized decisions whilst maintaining the integrity of the firm and to achieve its goals, requires multiple types of information, goal-information, axiological information, effect information and feedback information. In the MBE these types of information resided mainly in the heads and in the social system of the top-management of the firm. In the firm of the 21st century, to achieve Arrow's decentralized organization, that is front-line workers themselves can decide which of their alternative decision will contribute most to the firm, all these types of

information need to be made explicit and be communicated (Arrow 1974; Strikwerda 2010a). As Simons (2005) has demonstrated, tight control kills the adaptation capability of a firm as front-line workers will not accept new questions of (new) customers and or are not willing to experiment how to serve such customers, denying the firm information on changes in its environment.

A seventh consequence of the changing nature of the firm is with respect to the assumed economic model the internal organization of the firm is to be based on. Because managers in the MBE often suffered a cash flow trap or governance overhang, thus wasting the cash flow of the firm, shareholders have reduced the discretion of management with respect to the cash flow (Jensen 2001b; Zingales 2000). More fundamental are two other developments. Because of changes in the capital market, especially the availability of venture capital for start ups, it has become far more easier for e.g. software specialists, biochemists and other creative knowledge worker to start their own company. Either stand-alone or in the orbit of a larger firm through corporate venturing. Bhidé (2000) reports that 71% of start ups in the USA are by people who do so on basis of an idea they learned in their previous employment. That is, the complementarity assumed in the NBE between financial capital and human capital at least has weakened and that spending the cash flow on new product development or even new ventures no longer automatically results in new property rights for the shareholders. What the corporate governance revolution of the 1980s did was to break this equilibrium between discretion of managers over the cash flow and the complementarity between inside financial capital and human capital. That is the capital market, especially active shareholders and private equity are sometimes deeply involved in deciding how to spend the cash flow (or distribute it as dividends). However in judging whether management allocates the available cash flow most efficiently analysts, investors, and shareholders often recourse to the breakup value of the firm (Copeland, Koller, & Murrin 2000). The breakup value assumes however the M-form for the internal

organization, the firm being a portfolio of self-contained investments projects. This portfolio, so it is assumed, can be restructured by divesting one or more of its investments projects, assuming that no resource synergies or market synergies exists between the investment projects, that is the divisions, which can be contracted through the market. The growth of intangible assets, endogenous growth models (contrary to physical assets knowledge applied to de novo problems not only produces value, its own value also increases), offering creative knowledge workers a large personal market not being the open market, induces a new economic model compared to the M-form for the internal organization as most MBE deployed. This new economic model is the firm with one integrated economic model, which cannot be considered as a portfolio of self contained investments projects (Palmisano 2006). Although it must be noted that apart from creating synergies, that is to have a highest possible return on intangible assets, creating market power may be another motive to deploy the concept of the integrated enterprise (De Kuijper 2009).

The control revolution or corporate governance revolution require firms to be transparent, and it seems that firms turning themselves to an integrated economic model obscure the clarity of the M-form. To understand where in an integrated economic firm profits are made and where losses, firms like IBM, Microsoft, Nestlé, have organized their information disembedded from the management structure or division-structure in their internal organization. The ownership of information in the organization is no longer partitioned according to decision rights or rights to use assets; information is a shared corporate property. By organizing information in this way a number of benefits are achieved: a reduced risk to miss market opportunities, a granular insight in the performances of the firm over multiple dimensions to detect sources of profit and losses, elimination of internal transfer prices, thus eliminating the double marginalization effect as a source of sub-performance, facilitating teamwork between creative knowledge workers, providing a performance measurement infrastructure thus allowing

creative workers to be mobile in the organization while keeping title to their contributions and bonus.

So where does these changes leave us with respect to the design of organization of the firm? Compared to the situation in the first half of the 20th century not only the number of design variables have increased, also the scope of organization design has broadened e.g. type of contracts, outsourcing, degree of vertical integration, types of profit models and financing. The changing nature of assets, increasingly being intangible, the lower costs of information and communication, the increased speed and capacity of communication, as well a more flexible labor market, have lifted a number of design constraints inherent to the MBE, especially the role of structure. At the same time the traditional basis for control has been impaired. The combination of these changes with a weakening of especially the basic institutions in society (Beck & Lau 2005), have increased the uncertainty of the management of firms with respect to the design of their organization. Whereas in the past much of the uncertainty of firms was absorbed or contained by institutions, in today's markets increasingly firms need to organize in a way to absorb those uncertainties themselves. This is partly reflected in the growth of codes of conduct, business ethics codes etc. That is the restrictive side of reducing uncertainty, to which belongs also the risk management to reduce the risk of financial distress of the firm. More fundamental is that a number of firms through e.g. modular organizing, deploying the method of real options, platform organizations, multidimensional information spaces, succeed in organizing for uncertainty in a constructive, entrepreneurial way. Hence the increasing role of designing new business models: business model innovation.

7.4 Business model innovation

Chandler's dictum *Structure follows strategy ... but the market is the common denominator* used to be the context of the design of the internal organization. This worked well for the better part of the twentieth century. A first complication with respect to this dictum was created by multinational companies, which needed to reconcile local responsiveness, to be organized by country-based divisions (especially for the European MNC-model) with regional or global economies of scale. This resulted in the notorious debates on the MNC-matrix organizations with their problems (Davis 1979; Davis & Lawrence 1978). Chandler's assumptions that optimal economies of scale could be achieved within a single product-market combination was further eroded by the L-type costs curves of information technology based systems, and the increasing costs of R&D and manufacturing in platform technologies, e.g. in the car industry. The emergence of shared service centers changed the concept of the M-form with its self-contained organized divisions. The emergence of corporate account management as accountable entities (primary profit centers) cross business units respectively division turned out to be the final step in deconstructing the concept of the classical self-contained division. Structure now is being defined by both the multiple structures in markets and by the economies of scale and scope of resources, resulting in multiple structures within the same organization.

These changes in structure reflected underlying changes in the nature of assets, changes in cost dynamics and therefore changes in the economic model of the firm. The economic model of the firm in the neo-classical economy is rather generic and is at the level of investments and returns. With the emergence of services, information goods and the Internet a broader differentiation came into being with respect to revenue models, margin models and profit models (Slywotzky, Morrison, Moser, Mundt, & Quella 1999; Varian, Farrell, & Shapiro 2004). This change towards differentiation and innovation in profit models coincided with a change in Chandler's model from a scarcity in the supply side to a scarcity in the demand side: in most industries overcapacity exists, and growth is limited by demand. With that the power has shifted

from the supplier to the consumer. As a result of which the customer value proposition or solution for the consumers has become more important in competition.

Slywotzky & Morrison therefore situated the issue of organization design within the context of business design (figure 11).

- | | |
|--|--|
| <p>1. Fundamental assumptions How are consumer behavior / preferences changing (<i>profit drivers</i>)</p> <p>2. Strategic dimensions</p> <ul style="list-style-type: none"> a. Selection of customers b. How is value created? <i>Which profit models?</i> c. How will the created value be appropriated? <i>Which revenue model?</i> d. Differentiation and strategic control of markets e. What will be the scope with respect to size, growth and time horizon? f. Program of products and services? | <p>3. Operating dimensions</p> <ul style="list-style-type: none"> a. Capital intensity / financing b. Open/closed business model c. Architecture of the value network <ul style="list-style-type: none"> a. Purchasing system b. Manufacturing system c. R&D and product development system d. Distribution system <p>4. Organisational dimensions</p> <ul style="list-style-type: none"> a. Organization form b. Processes (operational, administrative) c. Hierarchy of values d. HR-policy e. Style of management f. Management control system g. Information infrastructure |
|--|--|

Figure 12. Slywotzky & Morrison's concept of business design as context for organization design (Slywotzky & Morrison 1997)

Others have elaborated the idea of business design under the label of business model innovation (Casadesus-Masanell & Ricart 2011; Johnson, Christensen, & Kagermann 2008; Osterwalder 2004). Johnson c.s. define as elements of a business model (Johnson, Christensen, & Kagermann 2008):

- Customer Value Proposition
 - Target customer
 - Job to be done (use value)
 - Offering
- Profit formula
 - Revenue model
 - Cost structure
 - Margin model
 - Resource velocity
- Key resources
 - People
 - Technology, products
 - Equipment
 - Information
 - Channels
 - Partnerships, alliances
 - Brand

- Key processes
 - Processes (design, product development, manufacturing, etc.)
 - Rules and metrics
 - Norms

Structure seems not to be part of their concept of business model, whereas key processes are. The absence of structure seems also to be the case in Kaplan & Norton's concept of the strategy map (Kaplan & Norton 2004). The concept of the strategy map can be interpreted as a method for organization design. The difference between traditional approaches for organization design and the strategy map is that the former focus on structure and the latter focuses on processes and on required investments in intangible capital (human capital, organization capital and information capital). The starting point in the strategy map as a method for organization design is, alike as in the concept of a business model of Johnson *et al.*, the *customer value proposition*.

The customer value proposition consists of multiple elements: the function or solution of a product or service for a customer (also functional quality), its price, availability, the way it can be found and selected, its technical quality (reliability), the information available on the product or service (its mediation), available pre- or after sales service, whether the product can be co-designed or co-produced (design-in), the role of partnership in the product or service, the brand image, type of value the product or service represents to the uses, e.g. use value, exchange value, hedonistic value or e.g. altruistic values (Hollbrook ; Kaplan & Norton:66).

A structure in the sense of resource configuration is assumed in the method of the strategy map. The difference between the method for traditional, budget-driven, method for strategy execution and the strategy map as a method for strategy execution is that in the latter the processes needed to deliver the customer value proposition determine the allocation and deployment of resources in an explicit way. This in itself does not seem to be particular new when the strategy map is applied within one business unit. When applied within one business

units the strategy map mainly serves the design of processes, especially their normative performances and the (time-phased) investments in especially intangible assets required for that.

The diminishing role of traditional structure becomes more clear when Kaplan & Norton in their *The Execution Premium* (2008) introduce the concept of *strategic theme* as a design element in the organization to execute a strategy. A strategic theme in relation to a strategy to be executed is what a process is in the strategy map to the customer value proposition. A strategic theme is assigned the status of an accountable entity, with measurable targets and an overall expense and investment budget. This budget is not a budget separate from that of the business units, staff departments and shared services centers. This budget of a strategic theme is built up from the contributions of multiple business units, staff departments and shared services needed to achieve the objectives of such a strategic theme. Those contributions are budgeted in the budgets of the contributing business units and departments etc. by a new expense category: STRATEX (Kaplan & Norton 2008:11). This way of organizing strategic themes results, as an element in the design of the organization, in a three dimensional budget-system (business units X strategic theme X time) as needed to execute a strategic objective, avoiding the pitfalls of the traditional unit-organization, budget-driven target setting and parochial interests. The concept of the strategic theme as an accountable entity, both in the budget system and in the control system of the organization, is the final step in organization design with which the structure-as-resource configuration is subordinate to both the delivery processes to perform the customer value proposition and the investment activities to execute a strategy.

With that business model innovation not only is about to innovate the customer value proposition and the profit model, it is as much about innovating the design of the organization of the *as it is the method of designing an organization*.

As of the moment of this writing no comprehensive model for business model innovation could be identified (Saly 2011). Osterwalder's business model canvas emphasizes the elements of a business model, but less the (cause-and-effect) based processes, Johnson *et al.*

more or less the same, but emphasize the role of resources in a business model. Kaplan & Norton do not label the strategy map as a tool for business model innovation, but this concept certainly is to be applied in business model innovation, be it that there is less or no emphasizing the profit model. Nevertheless, the various models together, as if *the wisdom of the cloud* contain perhaps not all, but most of the elements for business model innovation including the therefore required (re)design of the organization of the firm.

8 The role of psychology and information in organization design

8.1 Organization design as a process of decision making

Organization design can be understood a process of making decisions with respect to various aspects of an organization. A decision process is in itself an issue of design. Vroom and Yetton have identified a number of styles of decision making, autocratic, consultative, negotiating, group and delegation, which need to be considered alike in designing an organization (Buchanan & Huczynski 2004:758). Like any decision process, the design of an organization should satisfy a number of criteria:

- o The design serves the value maximizing objective of the firm, without side effects or externalities that are harmful to the material nor immaterial value of the firm
- o The design is actionable
- o The design is explicable to those who have to act on it, and the decision has an authority and logic of its own

- o Within available time and resource constraints a best use has been made of available information and insights with respect to cause and effect, the decision with respect to the design is based on understanding the situation
- o The design does not fix details which better can be left to the experience and judgment of local managers
- o The design motivates those who have to execute the design, even if the design is contrary to their own direct interests
- o Both developing the design and executing it should provide a learning opportunity for those involved
- o The design is arrived on basis of a properly chosen process or due process
- o The design process as a process to prepare the minds of those involved in the organization, produces behavior (decisions, choices, problem solving) that produces an organization that is efficient.

Organization design understood as a decision making process consists of at least the following elements (Bazerman & Moore 2009; Jensen & Meckling 1999; Simon 1945/1997):

1. The *intelligence* activity: identifying (sensing) occasions calling for a (re)design of the organization;
2. *Defining* the problem of (re)design, e.g. by scope, objectives, timing;
3. Deciding the *process* of designing, who should make / be involved in the design process;
4. Applying an *objective function* (or preference criterion, weighing different criteria) which specifies how which decision maker values the alternative outcomes of the design process will be valued;
5. Identifying *design variables*: those aspects of the organization which are under the direct choice of the designer;

6. Identifying design *theories* that is relating design choices to outcomes, if $X \rightarrow Y$, that is cause-and-effect relations. Theories preferably must be capable of being refuted by data and rigorous statistical methods (Pfeffer & Sutton 2006). But it must be noted that to such theories both apply the fallibility theorem and the principle of abduction (also see point 6 on assumptions) With respect to the relation between strategy and organization design see e.g. Kaplan & Norton, 2004, 2008 and Bower 2005.
7. The *design activity*: inventing, developing and analyzing possible alternatives;
8. *Identifying constraints* which apply to the design decisions to be made;
9. The *choice activity*: selecting a particular course of action from available alternative designs, including choosing an evaluation method;
10. Making the design happen, through implementation and defining corrective actions where necessary.

Alike as with respect to decisions in general it can be understood why especially redesigning an organization may be difficult. First it may be difficult to identify a situation requiring the redesign of the firm. Poor performance may have many causes, and changes in the environment often are tempted to be answered by the existing organization with existing work methods. Does account management require cooperation between business units, or does it require a redesign of the organization in terms of accountable entities? A second issue may be that the objective function against which to judge alternative solutions may not be clear. Especially when different players apply different objective functions. Decision makers not only pursue utility maximization but also morality. Patterns of loyalty may enter an objective function and more often people select means not just goals, first and foremost on the basis of their values and emotions (Etzioni 1988:36). Third it may be difficult to identify new design variables, as explained in § 3.3, also to relax conventional constraints may evoke resistance to change. Fourth there is always the question whether a new design will work.

In view of the difficulties inherent to organization design, by content and by process and especially in view of uncertainty many take comfort in believing in leadership, distributed widely in the organization. That is persons who do not need detailed, specific instructions, take responsibility, take initiatives as needed in the interest of the firm and the group and overcome the imperfections or worse of the existing organization. Organizations depend on such persons, without these things go slow in a red-tape bureaucracy way of working. True leadership is such a scarce phenomenon, especially leaders that have endurance over a long period. Individuals with a strong entrepreneurial attitude will overcome even serious flaws in an organization design. Even so much so that the need to redesign the organization ebbs away. But usually after about a year the lack of a proper design organization has drained so much of their energy that such persons quit the organization. The issue of the role of the perfect agent is further explained in § 8.6.

8.2 Psychological aspects of organization design

Like in decision processes with respect to investments, or portfolio decisions, a number of psychological aspects play a role in decision making with respect to organization design. Organization design is subject to bounded rationality (Ethiraj & Levinthal 2004b), bounded knowledgeability, dominant logic (Bettis & Prahalad 1995; Prahalad & Krishnan 2008; Prahalad & Bettis 1996), satisfying behavior (Simon 1945/1997), belief conservatism, event certainty (March 1994) and other psychological mechanisms. Both bounded rationality and dominant logic serve to reduce uncertainty. But they do so by reducing complexity, thus creating a risk (Ashby's Law of Requisite Variety) to steer the firm out-of-control.

Organization design as a decision making process is subject to March's dilemma between exploration (*rational decision making*) and exploitation (*rule following decision making*) (March 1991; March 1994:81) March's rational decision making is about explorative learning, visionary thinking, futurological thinking, formulating ambitious goals, breaking with and through

boundaries and rules. That is March's rational decision making is about Martin's abductive thinking. The rationality in March's rational decision making is breaking through existing rules to maintain the social system, whereas it may be in the interest of the social system to break out of such rules. March's rational decision making is different from and should not be confused with the rational decision making assumed in the neo-classical economy. In that definition of rational decision making all alternative solutions are considered and their value established, and the alternative with the highest value is chosen. Reality is that it often is too costly to identify and or to consider and to calculate all alternatives, apart from the constraints of time, available information, and costs. And even then, in identifying alternatives and acquiring information to evaluate these, psychological aspects like search heuristics and e.g. confirmation biases play a role. In organization design therefore *lexicographic choice* plays a role, that is alternatives are compared on a limited number of features, resulting from a (often not made explicit) hierarchy or preferences. Also sub-goal identification plays a role that is that due to an overall view on relations and aspects the *formulation* of the problem of organization design is chosen so that the formulated problem can be solved, by consultants or staff departments. The complicatedness of cost reduction often is reduced to head count reduction.

March's rule following decision making, aka exploitation, with respect to organization design is useful to achieve efficiency and maintaining existing social capital and its underlying routines in the organization. Rule following decision making with respect to organization design is also about maintaining existing power basis and social identities and social roles. Linked to this rule following decision making is that closed loop learning processes, as contrary to explorative learning, are pursued. That is outcomes as result of prior actions are interpreted in terms what happened, why it happened and whether what happened was satisfactory or unsatisfactory (March 1994:81). However this is only about observed outcomes, and this observation is subject to search heuristics, availability bias, and the interpretation is subject to e.g. confirmation bias, event certainty, etc. Interpretations or interpretative learning therefore tend to conserve belief in

prior existing understanding (disconfirming events or facts are suppressed or reasoned away), causality is simplified to temporal and spatial proximity, and cause-and-effect is interpreted within the context of the existing social conventions on cause-and-effect (March 1994:84-85). As a result vision and ambition tend to be under informed by changes in the environment, especially new possibilities, as vision and ambition are too much the result of a closed loop learning process. Another factor in learning processes is the capital intensity of information (Arrow 1974). This is the time and effort an individual, e.g. a division manager needs to spend to be able to work with a specific organization form. This capital intensity is high in cases the individual has learned to work with one organizational form only, it is low when the individual has learned to work with multiple organization forms. Organization (re)design from the perspective of the individual manager having achieved a specific position, therefore may be perceived as a destruction of hard earned personal capital and may therefore be resisted (unless for some reasons the individual manager understands that his personal capital as it is no longer will bring him the results he or she is after). Subsequently firms pursuing organization design or change on basis of such learning processes find themselves trapped in suboptimal stable equilibrium, until becoming marginalized by the market or are being corrected heavy handed by the capital market (forced break ups, acquisitions, removal of management).

Also in view of uncertainty and the increasing number of design parameters the idea of organization design as a learning process is attractive (Figure 2). Therefore the question is whether the documented pitfalls and shortcomings of learning processes, especially organizational defense routines (Argyris & Schön 1996), can be avoided by designing specific learning processes. Two alternative approaches can be identified.

The first approach is *variation, selection and retention* (March 1994:93). That is a firm experiments with a range of rules, practices etc. to discover which of these is successful in response to changes in the market or other environmental changes. This variation can be planned, intentionally, or it can be the result of imperfections, errors or subordination.

Successful variations often will be noticed by consultants or academics, validated, made transferable and sold to other firms as *best practices* (Davenport, Prusak, & Wilson 2003). Variation as a way to adapt the design of the organization or aspects of the organization to changes in its environment, assumes absence of tight control, especially with respect to front line workers (Simons 2005). Risk management by deploying strict processes and work methods and thus not allowing experimenting and variation creates the risk that the firm becomes *out-of-control* as a result of lack of adaptive capacity.

A second approach to (explorative) learning sometimes is labeled second loop learning and is akin to solving crisis in organizations. A crisis in an organization is a situation that aimed for objectives, or responses to changes in its environment (a) no longer can be achieved with the existing organizations, its work methods, processes, etc., (b) that the principles underlying the organization do not provide an answer to this situation and (c) those involved have sufficient mutual commitment to enter a process of challenging the existing holy cows of the organization, even if this creates a discordant atmosphere and conflicts, to identify new principles. This type of organizational learning is the same process to solve fundamental conflicts in the organization in a fundamental way. It also implies that those involved are willing to face fundamental uncertainties, which explains why this type of organizational learning is so rare (Argyris). This way of learning is what Martin (Figure 3) describes as exploring the level of mysteries. In a more analytical way this way of learning is exploring what assumptions are underlying a specific organization form or organization of a process, department, etc. and to test whether such assumptions still are valid. In that sense explorative learning also has an analytical, academic quality, apart that for solutions abductive thinking is necessary. This also explains why for Simons organization design also is about the meta-control of the firm (Simons 2005).

The difficulty of this second type of explorative learning is also demonstrated by Prahalad's concept of dominant logic. Explorative learning is changing the dominant logic, both at individual level and at the level of the organization. At individual level acknowledging that

one's dominant logic, once a source of success, no longer is valid, often will be experienced as a loss of face, and therefore resisted. At the level of the organization a successful dominant logic, by being coded into the various aspects of the organization and therefore controlling the thinking of most of the members of the organization, may blockade learning processes as needed for survival (Figure 13). This also explains why psychological factors restrict managers (agents) in making rational decisions with respect to the (re)design of their organization (Figure 5). The question to be asked is what happens if managers of a firm fail, due to factors as explained by March, Argyris, Prahalad, to rethink their business model, their organization, to achieve needed adaptations in relation to changes in their environment? The answer is simple, their firms will be obliterated and replaced with new firms, with new organizations forms based on new business models.

8.3 Organization design as a problem of consciousness

The relationship between the organization as a reification and a possible inability to redesign an existing organization (Figure 13) reminds is that especially redesigning an existing organization is like writing a computer program by the computer program itself. A computer program not only processes information, a computer program is itself information. The information to be processed may interfere with the information comprising the code of the program. In the case of an organization those tasked to reprogram (redesign) are themselves programmed by the system they are supposed to reprogram. Therefore it requires multiple levels of consciousness, of thinking and (self) observation to achieve a required redesign.

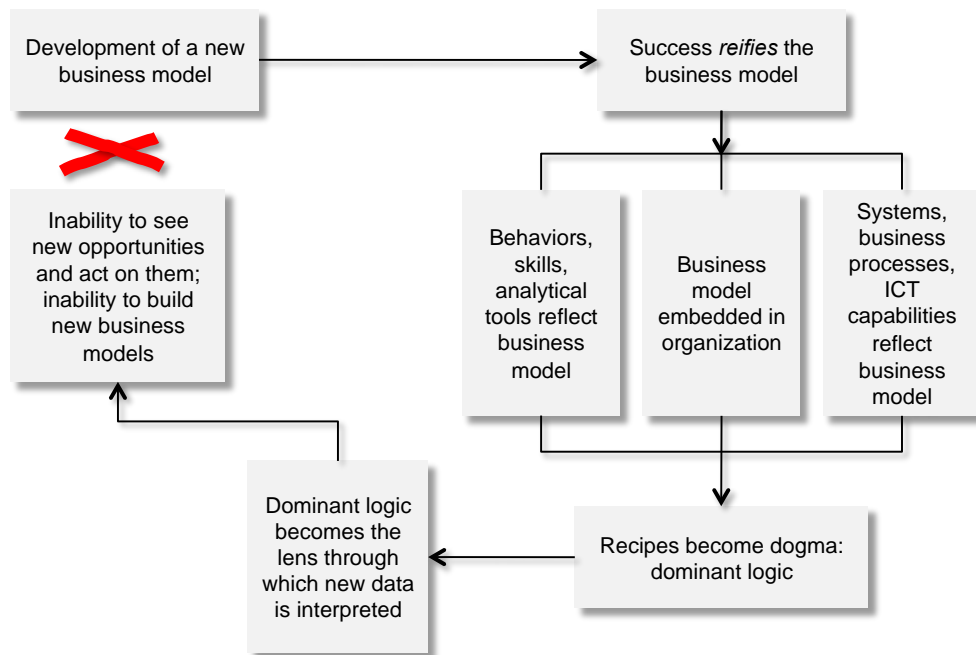


Figure 13. How a successful business model and its organization may block required learning processes and thus a redesign of the organization as may be needed for survival (Prahalad & Krishnan 2008:149).

The design of an organization is not a straightforward process by applying algorithmic type design rules. The question is therefore how to organize the process of designing and especially redesigning an organization such that debilitating influences of psychological factors best are mitigated. Some propose for this to see the (re)design of organizations as a change process and to manage the (re)design process as such. This approach however provides no solution how to avoid that the thinking on a required new organization will overcome the restrictions of interpretative learning or those to be involved are being programmed by the existing model (Figure 13).

To mitigate the effects of the psychological mechanisms explained before requires that the thinking on the design of an organization is elevated to a level different from that of the organization itself. The design rule, *form follows function* suggest that in order to design an organization first the business model which the organization serves, needs to be designed. The

designing of a (new) business model is neither straightforward nor without problems as explained by Prahalad and Krishnan (Figure 13).

Different methods for designing business models have been published and none of these seem to cover all needed aspects (Saly 2011). However all seem to agree that designing a business model starts with designing the customer value proposition for a targeted market segment. Next is that the processes, process performance, capabilities and required investments in tangible and intangible assets time phase are designed, including therefore lagging and leading performance parameters (Kaplan & Norton 2004). These processes are designed irrespective or overlaying (existing) organizational structures. Even more, these processes as accountable entities are crossed with existing departmental budgets (Kaplan & Norton 2008). The method of Kaplan & Norton is perhaps not so much about designing a business model, their strategy map basically is about translating the customer value proposition and strategic themes into a required organization design. Kaplan & Norton's method makes the implementation of especially a new business model in an existing organization a political process as it conflicts with traditional budget control of position holders. To solve this problem Kaplan & Norton propose that the design of the business model, especially its consequences in the organization and thus its organization design, is carried out by an Office of Strategy Management (Kaplan & Norton 2005). This assumes that this Office has access to all required information to create a design, whereas usually organizations suffer information asymmetry.

8.4 Organization design as a problem of information

The problem of designing an organization not only is an issue of overcoming psychological mechanisms, it is as well a problem of organizing the required information needed for designing the organization, especially in a situation of uncertainty. A method to do so is to

define the organization in terms of architecture, decomposability, modules, interfaces and information processes (Simon 1962; Simon 1973; Takeishi & Fujimoto 2003).

Whether the design of an organization is efficient is by definition uncertain, because it is intended for the future. “If an economic process is (Baldwin & Clark 2002a; Baldwin & Clark 2002b):

- *ex ante* uncertain
- *ex post* rankable by outcome
- *ex post* contingent
- costly;

and has non-exclusive outputs; and if better outcomes have higher financial value, then the value of that process will embed either simple real options (if the process is indivisible) or compound real options (if the process is modular).” As we have seen the modern firm has divisible processes in terms of sub processes, outsourcing, etc. Modularization defined by Baldwin & Clark is the process of splitting a large design into coherent units (“modules”) that can function together as an integrated whole. By definition modules are indivisible units of design activity within a larger, divisible and hierarchical system. Modularity creates options, makes complexity manageable, enables parallel work (innovations), is tolerant of uncertainty and modular designs evolve as the options are pursued and exercised. The business model is the architecture needed for modularity and the organization of information, including the factoring of decision making is what coordinates the modules, including resource allocation and resource mobilization.

We need to be specific on the idea of architecture. In § 2 of this paper a number of elements of the architecture of the internal organization of the firm are listed. The architecture of the internal organization however is to be based on the architecture of the business, especially the architecture of the customer value proposition. In their *Modularization in the Car Industry* Takeishi and Fujimoto describe a relation between hierarchies in the automobile product

development, production, and consumption. That is design starts with the design of the market needs to be fulfilled (which is the composite customer value proposition in business models), which then is translated in a hierarchy of functional design of the product, which in its turn is translated into the structural design (that is the modules like a dashboard, and their interfaces) and these are translated into a hierarchy of processes to be designed (for development and production, including outsourcing). That is they describe a nesting of architectures, the architecture of the product architecture fulfilling a need being the highest, to the level of actual production, including third party suppliers. Traditional structures in terms of bureaucratic, hierarchal structures and legal structures are subservient to this design of architecture. Whereas in the past structure was seen and dealt with for control, in the present economy the ownership of architecture and standards appear to be so (Chesbrough 2003; Shapiro & Varian 1999).

The method of design through architecture and modules combines the internal and the external organization, as well its relates to modern strategies with respect to when to operate a closed proprietary architecture or an open modular structure to deal with market uncertainties (Christensen & Raynor 2003).

It is to be noted that the hierarchy of values of the firm is an element in the business architecture, which values also need to be translated in the customer value proposition. A customer value proposition not simply is about the use value of a product, but may include e.g. hedonistic values or altruistic values (Holbrook). Also commitments to e.g. sustainability and care for the social community are to be included in the customer value proposition and subsequently must be translated in required (internal) processes and required investments to honor such commitments (Kaplan & Norton 2004:164-186). As we will see, their non-financial leading and lagging parameters need to be included in the design of the objective function of the firm.

The architecture way of design thinking relates to Simon's concept of the organization as a complex system, that is that it allows for localized instances of adaptive behavior in response to

new situations (including innovations on modular level initiated on that level) whilst maintaining the integrity of the overall system. Simon's concept of complex system also is to be read as a model of local (modular) information processing (interpretation of data into actions).

Design as a process through an architecture is organized in levels and modules not to reduce complexity, but to include as much as possible individuals in the design process in a coordinated way. An architecture with defined interfaces between modules also is a way, by having modules innovatively designed by third parties, to organize access to outside, new knowledge. Also, modules allow for innovative abductive thinking at a local level (to improve module), whilst the effects of errors in design on the rest of the organization (architecture) are contained by the defined interfaces.

This way of organizing the design of an organization is contrary to the functional way of organizing an organization. In that method it is first decided what the overall form, e.g. F-form or M-form, of the (internal) organization will be and then let business units, divisions, staff departments, shared service centers, etc. design the organization of their own department. A resource allocation process is then designed based on that structure. The problems which such designed budget-driven allocation processes are well known (Jensen 2001a; Sull 2005)

The architectural way of design, starting from market needs to be fulfilled and thus from a competitive thinking, translating this in processes being dominant over traditional organizational structure, places the issue of the design of the traditional organization, structure, decision rights, etc. in a field of forces in which the interest of the firm, its value proposition in the market, has a better chance to override parochial interests in the internal organization by those involved in the design process.

8.5 The design of the objective function

The design of the internal organization by way of architecture, modules etc. does not address all aspects of the internal organization to be designed. Any corporation needs in its organization an accounting system, an infrastructure for management information (including a

system for performance measurement, performance assessment, incentives), infrastructures for communication, an IT-infrastructure, etc. Depended by type of firm a number of staff departments will be needed (Textbox 1).

Textbox 1 List of typical staff departments:

Legal Affairs / Secretary of the Company
Finance/treasury
Accounting / corporate control
Risk Management
HR / Management Development
Fiscal Affairs
Public Affairs
Compliance
Investor relations
Strategy / business development
Mergers & Acquisitions
Intellectual Property
Communication
Environment / sustainability
Health & Safety
IT-Governance

Alike support functions like process control (recording transactions and costs), HR-services, IT-services, logistics, facilities, etc. which are of a generic, not-product or product based process specific, usually will be organized in a number of shared service centers. This in itself can be a design issue in terms of structure, geography, to be outsourced or not, coordination with the business etc. (Bangemann 2005; Strikwerda 2010b).

The point is that both staff departments and shared service centers by design of structure, not by issues to be dealt with, services to be provided etc., are organized as an infrastructure capable to nurture a specific range of businesses, customer value propositions, etc. Design parameters typically will be economies of scale, distance, costs of labor, fiscal aspects, (local) labor market, scarcity of expertise, etc.

An essential aspect in the design of the organization of the firm so far has not been dealt with. A firm, explicit or implicit, also has a purpose, a mission, values and subsequent a policy

with respect to sustainability, corporate social responsibility, compliance and other constitutional elements. How are these to be organized by the firm in order that these constitutional elements translate into behavior, in initiatives, in proper decisions all over in the organization? Two common approaches can be observed: special staff departments are established for especially corporate social responsibility, compliance, sustainability and for all those constitutional elements communication programs are organized, often combined with e.g. mandatory classes for ethics. In one specific case, a multinational, it was observed that within the business units some level of irritation existed with respect to the staff departments for themes like sustainability, corporate social responsibility, etc. The irritation more specific was caused by that first in the regular, bottom-up budget-driven resource allocation process financial targets non-financial targets and ceilings for investment capital and operating capital were agreed between the business units and headquarters, but then came those staff departments with requests for programs and targets to be initiated and executed by the business unit in their specific field. And in a number of cases business units experienced conflicting requirements, although they understood the value of constitutional themes.

Is it possible to have an organization design that avoids this irritation, or lack of coordination? Such a design solution does exist, but is to be found at a different level from processes and structure or even information, the required design is to be designed into the objective function of the firm or division.

A well designed objective function is needed to (a) achieve defined goals and set targets; (b) translate values, and commitments to e.g. sustainability in this achievement respectively the way these are achieved, and (c) to evoke behavior with the members of the organization that expresses the mission, values and commitments of the firm, whilst stimulating entrepreneurial, resourceful behavior.

An example of a simple objective function is *maximize return on invested capital (ROI)*, or achieve a $ROI \geq x\%$. Other examples of simple objective functions are to be found in the

second column of Figure 4. The problem with a simple objective function like *maximize ROI*, is that it evokes a bias in decision making by those who have the responsibility to achieve that target. In the case of an objective function stated as ‘maximize ROI’, harvesting behavior is evoked, because by withholding or reducing investments, but maintaining income, the ROI will increase in the short term, but the lack of investments in general will reduce future revenues and value creation of the firm. It turns out that virtual all financial targets evoke bias in decision making which is detrimental to either shareholder value in the long term and or the going concern value of the firm (Copeland, Weston, & Shastri 2005:472).

A second issue with the objective function is whether it is to be one dimensional or multi-dimensional (Jensen & Meckling 1999). Some will have it that: ‘multiple objectives is no objective’ whilst others claim that success of the firm is always multidimensional (Drucker 1958). The question is whether a simple one dimensional objective can be set in a world in which many aspects of the business are interrelated. Take for example an objective ‘to maximize profit’. A first question is, over what period, but usually this is short term to midterm. But as market share as a determinant of profit in many cases has a convex relationship with profit, that is maximum profit is achieved at a market share p in the short term which is smaller than the attainable market share q in the midterm of long term, the question is what is desirable for the firm in the long term and or in terms of strategic market position. Achievement of a high profit in the short term may be detrimental to the earning capacity of the firm in the long term. Vice versa, if the objective is to achieve a highest possible market share (which may be the maximum share allowed by the regulator from a perspective of market power), often this results in a lower profit because of diminishing returns on additional customers, e.g. due to pricing policy or higher sales costs. In general it can be stated that with respect to performance parameters no set of input-output parameters can be identified that are monotonically related.

A third issue with the objective function is that an objective to be achieved in many cases is subject to non-financial *constraints*. In the traditional organization design non-financial

constraints usually are imposed by a system of corporate policies, more or less systemic codified in a company manual. Often the staff departments for e.g. sustainability require reports from divisions and business units on their own terms, they require dedicated liaison personnel, except for setting targets, and often combine providing consulting on their themes with auditing the divisions on the same. This way of implementing corporate policies often is tedious, as no clear link is being made, and sometimes not at all, with financial performance respectively target setting, performance measurement and performance evaluation. Since firms either voluntarily or forced need to implement values and commitments to e.g. codes of behavior, the old method of implementing corporate policies need to be improved. The way to do this is using the technique of multi-attribute, multi-criteria decision making under constraints.

An example of a well known constraint is the limit with respect to the emission of carbon dioxide. The level of emission of carbon dioxide usually will vary with the level of production, e.g. in electricity production or in chemicals production. By using a technique from operations research, linear programming, such constraints are simply to be included in a quantitative way in the objective function. In the case of a utility firm, one of the elements of its mission, reliability in the delivery of electricity, simply is translated into criteria with respect to the uptime of the electricity delivery to its customers, response times to calls of customers, etc. Other constraints may be set in a way that cannot be included in the calculation part of the objective functions, e.g. excluding specific markets or customers, type of products, specific raw materials or sources, etc. By this method the values and commitments of the firm are to be translated into the objective function of the firm, respectively those of its divisions or performance of products. In general an objective function needs to specify:

1. What is to be *maximized*, financial (economic profit, cash flow), non-financial (market share, diversity in employment);
2. What is to be *minimized*, costs, waste, pollution, etc.

3. What are *constraints*:
 - a. Self-imposed constraints:
 - i. Financial, e.g. costs of capital;
 - ii. Non-financial, emissions, markets, constraints implied by mission, values and commitments to social responsibility, to employees;
 - b. Constraints imposed by law or other stakeholders the firm depends on: minimum wages, environmental, equal rights, etc.

Some may argue that it will be difficult, compared to traditional financial only objective functions to make clear decisions. This depends whether those involved are being trained or not in linear programming and techniques for multi criteria decision making, apart from the fact that linear programming is a standard module (Solver) in Microsoft's Excell spreadsheet program (Carlsson & Fullér 1996; Dyer, Fishburn, Steuer, Wallenius, & Zionts 1992; Goodwin & Wright 2010).

The issue seems to be that under the influence of shareholder value as the objective function in the nineties of the 20th century, related to performance based pay, one-dimensional financial-only objective functions became dominant. Kaplan & Norton's balanced scorecard for some appeared to be a multi-attribute objective function, but that is a misreading. The balanced scorecard is no scorecard, but a tool to translate financial objectives time-phased into required investments, especially with respect to human capital, information capital and organization capital, to overcome the limitations of budget driven strategy execution. An objective function as defined before needs a tool like the strategy map based balanced scorecard to identify required initiatives and decisions.

8.6 Designing behavior: the (re) design of the systemic context

By designing a multi-attribute, multi-criteria objective function another design issue of the organization is being addressed, that of behavior of the members of the organization. A number of authors, when discussing designing an organization, include elements like culture, leadership, behavior of the members of the organization, e.g. team work, etc. Traditionally the main instrument for influencing behavior was the structure of the organization. Structure could be applied for this because information would be partitioned by structure, the insight with respect to overall cause-and-effect beyond the level of the department to a large degree was kept in the minds of managers, incentives or variable pay and assessment was based on unit-performance and management controlled the mobility of workers cross departments or units, also in defining cross unit teams or not. For a number of reasons structure has lost its dominance in influencing the thinking, attitudes and behavior of individuals. Through internet, e-mail, social media, information increasingly becomes disembedded from structure, the general level of education and training has increased, there is an increase in working and cooperation on basis of cross-unit processes, there is an increase in self-coordination between departments, etc. This also is the result of deliberate changes in organizations to increase the information processing capacity in an organization.

There is debate on how to influence behavior of the members in an organization and even with respect to the question whether this can or should be an issue of organization design. Some propose, e.g. Collins in his *Good to Great* (2001) that strategy formulation and organization design is second to getting the right people on the bus. Implicitly Collins places a bet on the perfect agent (aka altruistic political man) as a model of man (Jensen & Meckling 1998). There are two problems with this approach, however popular with executives and non-executives. The first is that the perfect agent is such a scarce phenomenon that most companies cannot count on it. The second problem is that our perfect agent has a brother with a strong resemblance by appearance, manners and especially speak, but happens to be not an altruistic-political man, but a

manipulative-political man. That is a person who will use power gained and attributes rather for his own interests than for that of the community. Therefore to bet on the perfect agent to solve organization design problems is too risky in view of the interests of the firm and what it stands for. On the other hand however, an organization design never will be nor can be perfect. This implies that the success of any business design and organization design as much depends on a number of people in the organization which can be described by the resourceful, evaluating, maximizing model of man (REMM) (which especially are resourceful in achieving targets by bending the rules), and on a number of individuals who can be described by the model of the altruistic political man (perfect agents), which will understand the imperfections of the design, fill in the gaps and correct imperfections as intended in the design.

Add to this problem of the delusion of the perfect agent the *Fundamental Attribution Error* from organizational behavior, which describes that problems and mishaps in organizations are being attributed to the actions and will of the individual charged with the wrong doing as an individual person, while in most cases the real cause of the wrongdoing is in the systemic context of this individual (March 1994:183; Pfeffer & Sutton 2006). The interactionist perspective from organizational behavior explains that people's behavior results from the joint influences of both personality and the nature of the situations in which that behavior occurs (Greenberg 2010:70).

This 'situation' or 'context' in the interactionist perspective is labeled by Bower & Gilbert (Bower & Gilbert 2005b) the 'systemic context'. This systemic context consists of the mission of the firm, the hierarchy of values, the vision, the business model of the firm, the system of performance measurement, the resource allocation process, the organization of (management) information, the process of monitoring, control and performance evaluation, the system of rewards, the program for management development, and by implication the structure of the internal organization is an element in this systemic context. The function of the systemic context is to influence behavior of all the members of the organization to achieve the goals of the firm in an efficient way.

Bower, the author of the bottom-up resource allocation process (RAP), has observed that new strategies in many cases are not being implemented because managers responsible for defining new bottom-up initiatives as needed to execute a new strategy, let their behavior, content, scope and nature of initiatives, determine more by the existing systemic context as by the new strategy. For that reason Bower in an attempt to revise his bottom-up RAP, proposes that before a new strategy to be executed is being communicated to lower level managers to elicit new initiatives, first this new strategy needs to be translated into a new designed systemic context based on the new strategy (Bower & Gilbert 2005b). This redesign of the systemic context by definition will not apply to all elements of the systemic context, especially not the mission nor the hierarchy of values. Strategy after all is subordinated to the mission and the hierarchy of values. To understand what may be implied in redesigning the systemic context as a design variable in the design of the internal organization of the firm in the following the various elements of the systemic context are commented.

The first element of the systemic context of the organization is the mission of the firm. See § 9.3 of this paper on the mission being part of the system of control of the firm. A mission is, provided it is formulated well, the pivot in decision making and initiatives in the organization. As we have seen in the issue of the design of the objective function, a mission is to be translated into the objective function of the firm. The formulation of a mission is subject to a number of criteria with respect to what may be included or not in a mission statement. It may not contain targets, it may not contain a time horizon, or how the mission will be accomplished. A mission should be inspiring and motivating and attract those individuals which can identify with the mission, the identity, the values, products, services and customers of the firm, and repel those who can or will not.

The second element is the hierarchy of values (also see § 9.3 of this paper). This hierarchy of values not only needs to be codified into the objective function, but also into the

selection, training, socialization and assessment of the members of the organization. A hierarchy of values also defines whether profit or shareholder value is the objective of the firm or whether these are the result of what the firm performs on the market in terms of products and services (Collins & Porras 1994:59).

The third element in the systemic context is vision. It is often stated that firms, organizations need a vision, preferably a compelling one. Unfortunately in doing so the vision is confused with the mission and with ambition. Because vision has become a kind of anchor in social life it may be difficult to communicate that vision is about understanding changes in the environment of the firm in terms of consequences and needed actions to have the firm survive and perform its mission observing its hierarchy of values. That is (§ 9.3 of this paper) a vision is about producing eidetic information as one of the requirements to be in-control. Therefore a vision is not a static thing, producing and maintaining a vision as eidetic information is a continuous process in the organization. A firm or an organization does not *have* a vision; a vision is a continuous process of *doing*, of sensing and sense making. This requires for the design of the process, but also with respect to in which places in the organization the functions of sensing and sense making need to be organized. Traditionally this was organized in departments for strategy and for market research. The design of processes to generate eidetic information is not trivial, as the transformation of material information on changes in the environment into eidetic information is subject to a number of psychological mechanisms, which create a serious risk of flawed eidetic information and subsequent a flawed strategy (Ansoff 1984; Bazerman & Moore 2009; Pfeffer & Sutton 2006). To organize for entrepreneurship distributed in the organization implies that the functions of sensing and sense-making as much as possible should be organized distributed and on the edge of the organization (Alberts & Hayes 2003). This in itself requires elements as a strong mission, a clear hierarchy of values, understanding of cause and effect, fast feedback, in order that the production of eidetic information observes the goal, the integrity and the values of the firm.

Because vision is an anchor in social life to express ambition and to create identification, it might be considered, given that the production of eidetic information is provided for, that this eidetic information is translated into a motivating vision statement for reasons of identification of members of the organization. Mourkogiannes provides in his book *Purpose* (Mourkogiannis 2006:184) a useful oversight of themes and words to be used or not, to formulate an inspiring vision for a firm. But this should not stand in the way that only high quality eidetic information is the main source for defining the strategy of the firm.

A fourth element in the systemic context is an explicit description of the business model, in terms of cause-and-effect (in terms of the cybernetic control model the business model constitutes *effect information*). In traditional organizations the business model often was not explicit. The assumptions on markets, customer behavior, employee behavior, on what worked and what wouldn't was 'codified' at the level of sub consciousness or unconsciousness in the lowest of the three levels of Schein's model of organization culture (Schein 1999). Often only a few managers in the organization had an explicit understanding of the implicit business model of the firm. So it was through culture as the collective programming of the mind (Hofstede 1980), that by mechanisms of storytelling, values of expression of what works and what not (note that these are different types of values as in the hierarchy of values!), in an implicit way the implicit business model was transferred to new members of the organization, to program their behavior. Hence that many consider culture to be an element in the systemic context. As explained in § 8.3, especially a strong culture will block the capability of an organization to redesign it self, although it is a given that successful firms have elements of a strong culture. Due to the increasing availability of data and analytical tools, the trend of business model innovation (§ 7.4) expresses that all those unconscious and sub conscious assumptions on what works and what doesn't now is being replaced by evidence based management and competing on analytics. That is the movement of business model innovation supersedes the traditional role of culture. This process of replacing traditional culture with an explicit business model, together with a mission

as defined in the cybernetic control model as well the hierarchy of values is perfectly consistent with the development to increase the data and information processing capacity of organizations. However in this process in few cases the link between traditional culture and business models is understood and so it may happen that culture programs and processes to innovate the business model are run parallel, creating the necessary confusion.

A fifth element in the systemic context is the system of performance measurement. The design issues are *reportable dimensions* (including strategic themes, cross unit projects, account management, etc., in addition to traditional units) and the performance parameters (financial and non-financial) as part of designing the objective function and using the concept of the strategy map to define normative performances of specific processes and initiatives.

A sixth element in the systemic context is the process of allocation and deployment of resources (the resource allocation process, (RAP)), setting targets, including the process of conflict resolution between market opportunities and resource utilization. The traditional budget-driven, bottom-up resource allocation process no longer can be applied by default. Dependent on the business model, its nature, its causal relations, a specific allocation process needs to be designed. Burgelman has documented how within Intel decision rules within the process of resource allocation unintended changed the strategy of Intel (for the better) (Burgelman, Christensen, & Wheelwright 2009). Kaplan & Norton's concept of the strategy map, respectively their concept of strategy execution (Kaplan & Norton 2008) make clear that there is a solutions to Bower's problem with his own traditional bottom-up resource allocation process, including the issue of intangible assets for which Bower failed to identify a solution. In the concepts of Kaplan & Norton a distinction is being made between the configuration or allocation of resources (in traditional organization units) and the actual deployment of resources. In Kaplan & Norton's concept the actual deployment of resources is through initiatives which are part, on basis of validated cause-and-effect, of the processes needed to perform the customer value proposition respectively the strategic themes, process which may cross multiple traditional

units and thus their budgets (Kaplan & Norton 2008:116). This is a fundamental change compared to the traditional unit organization, as it limits the discretionary power of the traditional budget holder, the unit-manager. But it is perfectly consistent with the new economic models and the role of intangible assets.

The seventh element in the systemic context is the organization of information. The conventional design for this that information was structured according to the hierarchical structure of the internal organization and that each manager owned (controlled) his own information. Due to high costs of information, information management was about defining who needed which information and how to provide this. The modern approach is to organize information disembedded from the structure of the internal organization. This is for reasons to facilitate the earlier described architect-modular-process design approach, but also to avoid myopia in evaluating market opportunities, and to facilitate team work, resource mobilization, etc. This is enabled by the declining costs of information. By organizing access to as much as possible information, financial and non-financial, customers, markets, products, etc. entrepreneurial behavior is facilitated in which individuals as much as possible can calculate which of their alternative initiatives will contribute most to the performance of the firm, externalities included. Individuals themselves, on basis of their understanding of mission, values, eidetic information, objective function, understanding cause-and-effect, are able to and will decide which data or information is relevant and how to interpret it. Such a design is as logical as it implies a fundamental sociological change in an existing organization. It reduces information asymmetry, for many an important source of power. Therefore such an organization of information usually requires constitutional decisions by the executive board, to avoid that all kind of technical problems are misused to achieve such a required organization of information.

The eighth element in the systemic context is the process of control and performance evaluation. Typical design parameters are frequency of control, tight control or loose control, the mix between diagnostic control and interactive control (Simons 1995), self control in relation to

hierarchical control, bilateral control or panoptic control, the use of various types of rolling forecasts and their time horizon. Another dimension of the process of control is the level of control and its time horizon. Often control only is about performance. Effective control also is about leading parameters, that initiatives, projects, investments, are timely started, properly executed, before they will produce performance. To be in-control also requires premise control, whether the assumptions underlying a strategy, an investment, a product, market, a process, still are valid. Control is therefore also about identifying uncertainties and preparing for these, both strategic and operational uncertainties. Risk management, identifying risks and organizing for mitigating risks should be part of the control process.

The ninth element in the systemic context is the system of rewards, respectively variable pay in relation to fixed pay. Design elements are the basis of variable pay, unit performance or corporate performance. The mix of corporate or unit performance and personal achievements is another design parameter. A touchy issue is the type of variable payment, is it a step function, a linear, convex or concave function (Jensen, Murphy, & Wruck 2004). Especially a step-function based bonus system is detrimental to setting challenging targets and often provokes harmful behavior, cooking the numbers, taking a bath, shifting cost or revenues, etc. An incentive system should be designed as part of the business model, especially that ex ante the ex post distribution of the results of cooperation is understood to illicit most efficient initiatives.

The tenth element in the systemic context is the program for management development, training and coaching. Often career planning and career paths are linked to such programs, but it is also about socializing for making a career. Admission to such programs often is based on behavior of individual (junior) managers, judged through the lens of having potential or not by their superiors. Especially the ambitious with political skills are aware of this process and therefore understand to what behavior to display in order to be admitted to higher courses and programs.

Especially in a process of redesigning an existing organization, by a participative process, it needs to be discussed in what ways the existing, to be redesigned organization, will influence, positive or negative, the new design. And it might be that like in Bower's revised resource allocation process, a step prior to the actual design process is needed, to make as much as possible those involved in the process, aware what presently influences their thinking with respect to a preferred design of the organization of the firm beyond and above their personal preferences and interests.

8.7 Organization design as a process of change

The mutual relation between behaviors and (re)design of the systemic context lays bare that designing an organization not only is a process of decision making, especially in the case of an existing organization, (re)designing an organization as much is a process of change. In most cases organization design is a process involving at least a considerable number of those who will have to work with and in that organization. Despite the fact that the design of an organization needs to start with a business model, the translation of that business model into an organization operation that business model leaves ample room for interpretation and alternative decisions. It is unavoidable that the generation of alternative solutions and assessing alternative designs, especially subsystem designs by those involved in designing and decision making, will be influenced by their personal interests, position, power, prestige, future careers, job evaluation, rewards, etc. Some will see their interests served by a new design; others will see their interests impaired. Some will be challenged by new opportunities for personal growth, others may be scared that the limits of their capacities become exposed. So is corporate life.

This raises the question to what extent the redesign of a firm should be organized and managed as a change project. The traditional management of change, as this was conceived back in the sixties of the twentieth century, was aimed at overcoming resistance to change mainly with

workers and lower level management. Its techniques are heavily based on information asymmetry, making senior managers dependent on lower level management for accomplishing needed change. Traditional management technique therefore is based on participation in changes processes, education and communication, facilitating and support, but may include manipulation, co-optation and coercion, dependent on the level of information asymmetry. Such techniques date back to a period when change mainly was driven by efficiency improvements, not by fundamental changes in business models. Also the traditional techniques for change management date back to a period with time life employment, entitlement, a strong relation between personal status and position in the hierarchy, most workers did not know their value at the labor market, idiosyncratic work methods, etc. as a result of which change in most cases was experienced as threatening, apart from the fact that personal esteem was felt to be violated by the power of the system. So resistance to change in many cases was needed to maintain self-esteem.

In today's organizations change is to be considered within a completely different context compared to the period methods for change were developed. Life-time employment is a thing of the past. The reduction of information asymmetry reduces both the size and nature of the devil and the size of the tail he is to be found in. Managers, trained workers and professionals enjoy a mobile labor market. An attempt to reduce resistance to change may be answered by change of employment. Processes can be designed and operated by third parties. Whereas in the past resistance to change was to be found on the work floor, now it is with managers occupying a position, but experiencing that positional power is eroding.

As far as change techniques need to be used, this is much more by change projects and experiments, as has been the case in Sony Europe and Philips Electronics in the nineties, to discover who of the present managers have an attitude fit for the required process of redesign, and which have not. To this is to be added that new business models may require new sets of skills, knowledge and attitudes. Not only with respect to operational tasks, but as well in finance/control, IT and other staff for support. Identifying these required sets of skills,

knowledge and attitudes is part of the design process. This implies that part of designing the process how to (re)design the organization is to identify who of the existing organization should be involved in this process and who not.

9 What will be core questions and objectives for organization design in the 21st century?

9.1 Hierarchy in design: business over structure

A main difference between organization design in the 20th century and that in the 21st century will be that in the 21st century organization design will be explicitly based on an a priori explicit business design, and that processes are prior to Roman-Weberian hierarchies, also with respect to resource allocation and deployment.

This subservient position of organization design to business design may assist to take much of the politics out of organization (re)design and organizational change processes. Undoubtedly this new position will create new (political) challenges for managers and for the process of organization design itself.

Any business design or business model is subject to feedback relations from its markets on its assumptions. These feedback loops tend to shorten due to a mediated world which social media providing opportunities for extreme fast feedback loops. The speed of feedback loops most likely will be different for various industries, types of products etc. Also, due to social media the power such feedback loops represent is stronger compared to the feedback from market research in the past.

The most ideal solution to this development would be, in view of Simon's definition of a complex system, that a business model can be designed so, including its supportive organization, that this feedback is an automatic input into the business system, including its organization, producing required adaptations and even reprogramming the system. Business models like that of Google, in which input from customers (mouse clicks, search terms) are processed by an

algorithm, or on a smaller scale nu.nl, a news website in the Netherlands run by the Finnish publisher Sanoma, have first elements for self-adjustment built into it.

9.2 To design for in-control

The question is therefore how to organize in order that the firm is *in-control*. Control is the acquisition and processing of (external information), to steer the flows of energy and matter in order to survive in a changing environment. Control in this sense should not be confused, although there is a relation, with control as defined by audit. The nature of control needed in organization design is that as defined in the theory cybernetics, as we will explain.

The modern organization needs to be a complex system in order to be in-control. Churchill's design rule for the military during the Second World War applies as well to the modern corporation: "Make it as simple as possible, but not simpler" which basically later would be phrased as Ashbys' Law of Requisite Variety. An organization needs a level of complexity in order to be successful and to survive. "A complex system demonstrates properties that facilitate the evolution and survival of complexity" (Simon 1962:467-482; Simon 1973:3-27). Such systems are characterized by three properties. First such systems have a hierarchy of nested subsystems (like departments within a division within a corporation). Although Simon is not explicit on this, it should be noted that this system of nested subsystems not necessarily needs to be linear: subsystems may cross multiple higher systems (e.g. account management crossing multiple business units). Also, subsystems not necessarily need to be completely enclosed in the main system, they may extend the main system, e.g. co-creation projects with customers. Second between a system and its enveloping system exists information processes in the sense of programming. Corporate headquarters as the enveloping system of a division through a variation of mechanisms will guide a division in its objectives and actions to contribute to the objectives of the firm at corporate level. Third, this programming is not total or absolute but has a loosely coupled nature. Especially this loosely coupled programming allows for localized instances of

adaptive behavior in response to new situations. This adaptations at localized level, to be responsive to environmental changes in order to survive, may influence the programming at the level of the enveloping system (learning organization, organization as open system) to the extent that the identity and the integrity of the firm is preserved.

This may be sound and proven theory (but not always practice), but the question is how to translate this to a world of managers, consultants, auditors, regulators which tend to be anchored to concepts and logics of the 20th century. The key to this is in Simon's concept of 'programming', which refers to the cybernetic concept of control. The formal study of control is cybernetics. Cybernetics explains how living systems, biological, the individual, social systems, different from inorganic physical systems, are *organized*. The function of this organization is to generate, acquire, store, process and to communicate information: to control the flows of matter (input-output economics) and energy (ecology) in order that the living system remains alive and whenever necessary adapts itself to changes in its environment to survive (Beniger:40). Control is purposive influence (of matter, energy, behavior of individuals and groups) towards a predetermined goal. All control is programmed. This program may be physically encoded information as in Watt's regulator, in DNA, in the nervous system, in cultural programming (conventions, beliefs, institutions), in organization (bureaucracy, a system of profit centers, costs centers, decision rules, professional methods) and in technology, especially computer software (Beniger 1986:40). The nature of the program is IF<Boolean expression>THEN<Action 1>ELSE<Action 2>.

In order to achieve a state of *in-control* in a changing environment three requirements have to be met (Beniger:66):

1. *Existence or being*, the problem of *maintaining* organization—even in the absence of external change—to counter entropy;
2. *Experience or behavior*, the problem of *adapting* goal-directed processes to variation and change in external conditions;

3. *Evolution or becoming*, the problem of *reprogramming* less successful goals and procedures while at the same time preserving more successful ones (e.g. business transformation).

To achieve this, information needs to be organized and processed. But in cybernetics information is a different thing as it is in ‘management information’ or in information technology. Cybernetics discerns two main categories of information:

- A. The behavior of the system must be described in a mathematically precise way;
- B. The purpose of control (criterion) and the environment (disturbances) must be specified, again in a mathematically precise way.

To this it must immediately be added that in economics nor in firms it is possible to fulfill the criterion of ‘mathematically precise’. As March (2006) observes: “The systems being modeled and analyzed are substantially more complex than can be comprehended either by the analytical tools or the understandings of analysts. As a result, important variables and interactions among them are invariably overlooked or incorrectly specified.”

9.3 Designing the organization for processing information

However, these two main categories of types of information are too coarse to be useful. A closer look in cybernetics reveals a classification of types of information that can be linked to the issue of organization design, including its institutional requirements. The cybernetic types of information are (Garfinkel 2008; Peursen, Bertels, & Nauta 1968; Sutcliffe & Weber 2003; Weick, Sutcliffe, & Obstfeld 2005):

- Goal-information (mission, *strategic intent*)

- Motivation-or axiological information (the values of the firm, its hierarchy of values)
- External information
 - Material information (objective facts about the external situation)
 - Eidetic information (interpretation of the material information in view of the goal information and the axiological information)
- Instruction- or effect information (IF <> THEN <> ELSE <>), respectively the business model, causal relations, mechanical causality, structural causality, the cybernetic program
 - information about the validity of the organic, respectively the cybernetic program
 - Internal mechanisms
 - External mechanisms
- Pragmatic information (choice information) (This is what usually is labelled management-information)
 - Internal pragmatic information
 - External pragmatic information

All of these types of information need to be in place in order that a firm achieves its goals and survives in a changing environment. These types of information shed a new light on a number of familiar phenomenon's in the world of business and institutions.

Since about 1990 many firms have put effort in defining a mission. A mission defines the enduring purpose of a firm or non-profit institution: why do we exist, what must we accomplish? (Bart 1999; Collins & Porras). A mission is the pivot in the governance and management of a firm: it is the canon for decision-making, taking initiatives, innovation and self-coordination. A mission inspires and motivates members of an organization to focus on common objectives and

is key in attracting new members who can identify with the mission. “Maximization of shareholder value” is not a mission but a goal. Deutsche Bank Japan’s “We compete to be the leading global provider of financial solutions for demanding clients creating exceptional value for our shareholder and people,” neither is a mission. But the mission of the German Raiffeisen Banks, dating back to 1845: “The social-economic development of the local community by providing access to capital on basis of *Selbsthilfe, Selbstverantwortung, Selbstverwaltung*,” turns out to be to today an effective guide in adapting the cooperative bank, e.g. de Dutch Rabobank, to adapt to changes in society, including the capital market, to fulfill its mission. Basically the mission of a savings & loan bank simply is: financial intermediation under reduction of transaction costs/curbing the effects of information asymmetry (Mishkin 2003). Viewed from this mission it helps to understand what caused the subprime crisis in the USA: losing sight of the mission of the savings & loan institutions (Gorton 2009). In terms of organization design we might conclude that the intuition in business to have a mission was needed, in a response to the increasing uncertainty in society, in markets, in the internal organization, was right. But the need for a mission in a multimedia environment by (communication) consultants was interpreted as a combination of communications and signs. It was overlooked that a mission is by nature a type of information to program the thinking and actions of members of an organization. As a type of information the mission of a firm always has existed, but implicit, induced by institutions, carried by executives and transferred to new executives on basis of the Roman imperial method. The MBE was expected to produce profits, employment, to be run for eternity as a going concern and in that way reduced uncertainty. The introduction of shareholder value in the seventies, by the resulting restructuring of the US economy, which in itself was needed (Donaldson 1994; Jensen 2000b) introduced a higher degree of uncertainty. The reaction to liberalization of markets, reduction of government, a number of crisis and affairs has increased the uncertainty in society, to which firms were forced to respond by corporate social responsibility and

sustainability. As a result what a firm stands for, needs to be made explicit in the present day society.

Alike, many firms have put effort in defining values in a number of cases in combination with or codified in a code of ethics. Why do we need values as part of organization design? Simply, because as a result of the erosion of traditional institutions in society, which used to be implicit carriers of values, we need values to make sense of our environment. Institutions, values, including trust, reduce the complexity (and thus uncertainty) in society by almost unconsciously excluding certain behaviors and decisions (Luhmann 1968). Decisions in business and in life seldom are one-dimensional by criteria against which alternatives are judged, apart from bounded rationality and bounded knowledgeability. The focus on financial performance in the nineteen's introduced the mnemonic SMART as a criterion for targets: simple, measurable, attainable, relevant and timely. In decision theory SMART stands for simple multi-attribute rating technique (Goodwin & Wright 2010:33). The design of the objective function (§ 8.5) needs to fulfill this second meaning of SMART. SMART as simple multi-attribute rating technique does not reduce complexity but requires a hierarchy of values to make decisions in complex situations, in an efficient way.

Each individual, group, and culture organizes values in a hierarchy of importance (Feather 1996, quoted in (Cha & Edmondson 2006)). A value tells us what an individual or group wants to be true or not to be true in a prescriptive way. A value is activated by, yet transcends actual situations and as such is an abstraction (Rollinson & Broadfield 2002). Values as axiological information are required to make selections in an environment, especially with information overload and to judge what events and changes in an environment may implicate for one's own system and survival and thus judgment and behavior. Values are tied to the affective system, such that people feel happy when their important values are fulfilled; angry when these values are frustrated (Cha & Edmondson 2006). In a world with strong institutions as an

environment for firms, especially when there is sufficient congruence between the values of those institutions and those of firms, hierarchies of values are implicit in the social system and transferred to members of an organization predominantly through pre-socialization, especially in socially homogenous societies.

In the world of second modernity (Beck & Lau 2005) or multitude (Hardt & Negri 2004) no marginal values exists and either-or-values have been replaced by and-values because the dichotomies of the modernity have disappeared in the second modernity. As with missions, the intuition in the nineteen's of the twentieth century, that values needed to be defined to guide behavior of workers in organizations, has a just reason. But a proper lack of understanding of the true nature and roles of values has lead firms to define values, not as a guide to select and interpret information from the environment and to make decisions, but as prescriptions for behavior. Values were defined to be efficiency, innovation, customer first, mutual respect, trust, participation, teamwork, transparency etc. In a world in which the goal of a firm is being discussed, is it profit making, is it shareholder value, is it shared value, sustainability, contribution to welfare, corporate social responsibility, a hierarchy of values is needed. A successful example is the Credo of Johnson & Johnson, introduced in 1942 (Collins & Porras 1994:59). This Credo is a clear hierarchy, stating that the first responsibility of the firm is to produce good products for doctors, nurses, mothers at lowest costs, and that the fifth responsibility, having observed the other four, that this should result in a fair return for shareholders. History has proven that this Credo has effectively helped Johnson & Johnson to make sensible decisions in times of crises, compared to their competitors not using such a hierarchy.

To be successful and to survive in a changing environment firms need to have an open exchange with their environment with respect to all kinds of information. This has been understood from early on as demonstrated in Scott's definition of organizations as open systems. The issue has become how to avoid biases and heuristics in selecting and filtering of information

in the environment (Ansoff 1984; Bazerman & Moore 2009). To that is related how and where to organize the sensor functions of the organization, centrally in departments for strategy, market research, and technical research? Or should the sensor function be with front-line workers, those facing the customer face to face, working with the customer as well? Retail firms like e.g. Wal-Mart, Albert Heijn, use their check out systems as sensors with respect to customer preferences. Actually it turns out that POS-data is a valuable input in the production function of a retail firm. Also social media turn out to be sensors for firms, to be part of the design of their information in the organization.

To have relevant information on the environment, material information in terms of cybernetics, is one, to interpret this information into consequences, decisions, actions for the firm to achieve goals, which is to produce eidetic information, is a second issue. To turn material information into high quality eidetic information is depending on a clear mission and a hierarchy of values. But often this programming by mission and values is not always explicit in an organization, detached from its (physical) systems like organization structure, job descriptions, work methods, equipment, rules of thumb, etc. More often mission and values, especially in the case of successful firms, through reification, unintended, has been programmed in the structure, processes, procedures, available management information, performance management system, reward system etc. of the organization. This programming, as intended, defines behavior of most of the members of the organization, including the way how (new) material information is turned into eidetic information (Prahalad & Krishnan 2008:148-149). So the material organization itself has become dogma, a dominant logic, the carrier of the codification of culture, and with that a lens through which new data is interpreted. Often resulting in an inability to see new opportunities or threats and to act on them (Prahalad & Krishnan 2008:149). This of course affects the definition of new strategies, that is choices to be made how in a changing environment to achieve the goals of the firm. Too often strategies of firms turned out to be restrained by the internal organization, resulting in satisfying behavior and underestimating or

neglecting opportunities, to the effect that the capital market has stepped in to correct this phenomenon. The organization becoming a recipe, a dogma, has led Bower and others to conclude that the popular bottom-up resource allocation process, because a new strategy usually not is translated into a new systemic context, that is a reprogramming of the organization as a program to guide decisions of managers, is failing us. Initiatives of unit managers to implement a new corporate strategy appear not to be guided by the content of the new strategy, but by the programming by the existing organization (Bower & Gilbert 2005b; Sull 2005).

The (re)design of an organization by its members is subject to the same psychology as that resulting in the failure of the bottom-up resource allocation process. The question is whether those programmed by the organization they work in, are able to decode from that organization the implicit mission, hierarchy of values, basic assumptions and to see these detached from both the material and the social organization. This even leads to the question whether a theory or method for designing organizations is or can be neutral with respect to business models.

Instruction or effect-information is about causal relations. Causal relations may be of different kinds, dependent on the system. Causal relations may be mechanical, of a statistical nature, structural, etc. Much has been researched and written on what 'causes' human behavior, but workers over time and generations respond different to stimuli, also because of the reciprocal nature of behavioral sciences, consciousness and behavior. As explained before with respect to the concept of the MBE, the cause-and-effect of traditional business models was combination of being implicit and explicit in the mechanics of equipment and production processes. Due to changes in scarcities in the economy, and with that a change of value creation from the production process to after sales services, engineering, co-creation, etc. the causality of the value creation process became more obscure in the system. Traditional accounting techniques failed to trace precisely where value was created. With the explosion of business

models, each of them needs to be made explicit in terms of processes and cause-and-effect in order that workers themselves can initiate actions, respond to (new) situations. This explains Osterwalder's definition of business model in which he emphasizes the causal relations. Also, due to the shift to intangible assets, including creative knowledge workers and a different organization of value creation processes, firms need to be explicit about revenue models, profit models and thus their business model.

Making the business model explicit by elements and cause-and-effect relations also is required to increase the information processing capability of the organization. In some firms workers complain about information overload. More precisely it is data-overload. To have data-overload is to say that workers cannot judge whether the data is relevant or not and they cannot turn that data into meaning, decisions, actions, judgments. The reason they experience is not the amount of data, but the lack of effect-information, often in combination with an ill phrased mission and a lack of hierarchy of values. Basically data (after having been selected and rated on basis of mission and a hierarchy of values) is turned into information on basis of an IF <...> THEN <...> ELSE <...>-statement. In the presence of a clear mission, a hierarchy of values and effect-information by definition no data-overload can exist. Hence that Alberts & Hayes (2003) plead for informing front-line corporals in the field with these types of information to increase the capacity and the speed of the army to process field intelligence into eidetic information, that is required actions. Another element in cause-effect relations is that in highly uncertain business with high risks in investments especially due to sunk costs (e.g. the movie industry), business models are based on the real option theory. The real option theory structures uncertainty and therefore defines more precisely what information is needed to reduce uncertainty. Akin to this is to define products and services in a modular way.

The movement to make cause-and-effect relations of a business model explicit can be seen in the trend in business that the budget-driven method for strategy execution (Bower's

bottom-up resource allocation process) is being replaced by resource allocation based on (validated) cause-and-effect relations.

Pragmatic- or management information is about the information needed in the system of management control, including second and third levels of control, adaptation and transformation. Traditionally management information is defined to be financial or accounting information, about budgets, targets, performance and efficiency. This information is historical, structured and validated. It primarily serves financial accounting. From a perspective of control however, management information includes more, not only the traditional historical, internal financial information, it also must comprise future information (e.g. rolling forecasts, scenario planning), external information, non-financial information, unstructured information (e.g. intelligence on customers and competitors). Especially, related to material information, information should trigger timely adaptation and transformation. In the MBE the structure of its internal organization served to organize information, due to the high costs of information and communication. To have decentralized organizations to have maximum information processing capability, as defined by Arrow, that is that as many members of the organization can decide for themselves which of their alternative initiatives and decisions will contribute most to the overall performance of the firm, including externalities on other departments, requires that workers have access to all management information and effect information. That is precisely what advanced companies do: they organize the information of the organization, all types of information, disembedded from the structure of the organization and, except for some security measures, make this information available to all. Also these firms have multiple reportable dimensions, not based on organization structure, but based on the complexity of relevant markets and internal value creating processes, including synergies. All the information organized disembedded is shared across structure. This information sharing also enables creative knowledge workers to

spot opportunities where they, to their own judgment, but with tracked contribution by the employer, can best put their knowledge and expertise to work.

We can now understand more precisely what Simon is after when he wrote “The major problems of [...] organization [design] today are not problems of departmentalization and coordination of operating units. Instead they are problems of organizing information storage, and information processing - not problems of the division of labor, but problems of the factorization of decision-making” (Simon 1945/1997:307). Drucker (1988) predicted the end of the command & control organization and that organizations would be information based. Drucker did not elaborate on this, but now we have an understanding of what an information based organization is.

9.4 A generic model for organization design

Managers need to economize on decision making. A way to economize on decision making is to use simplified models. As explained in this paper, there is a risk in simplified models, because elements left out tend to become critical design parameters, and simplification creates the risk of applying old models to new situations. Nevertheless, an essential element in organization design is to define, or design for a specific period a simplified model to facilitate the discussion between those involved in a process of organization (re)design.

Another issue in defining a simplified model or theory for organization design is that it should provide a link between conventional thinking and practices and new, abductive thinking, new business models, new types of assets, etc. Management books often are written in an apodictic style: managers must. An organization design needs to be understood by those involved as a prerequisite for feeling comfortable with it, identification, self-coordination, and to

correct flaws in the execution of the design in relation to the intention of the design. The understanding of a new model often suffers the horseless-carriage syndrome: a new design tends to be understood and judged in terms of existing, familiar designs. Therefore a simplified model of organization design also should allow to answer the question how a new design relates to old designs. Figure 14 is a proposal to include the various elements of new organization design, in relation to old organization designs in a comprehensive way.

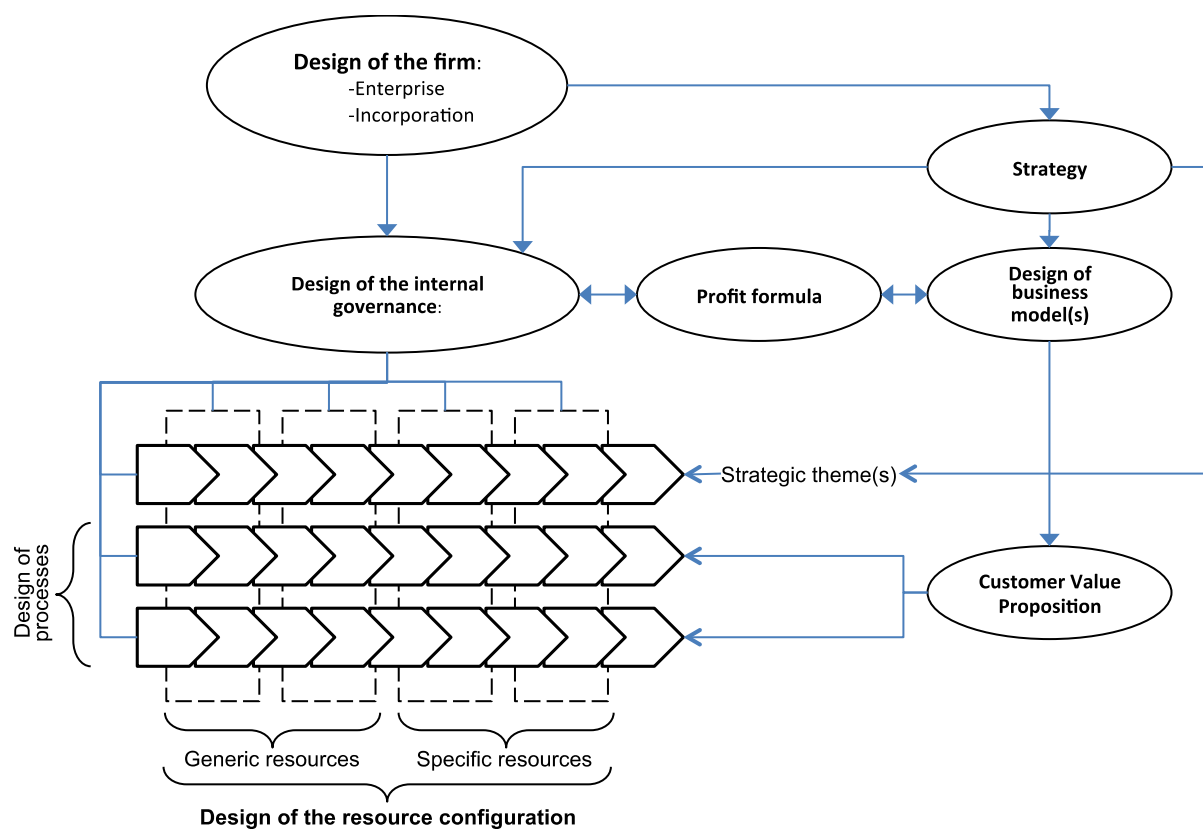


Figure 14. A generic, comprehensive model for organization design.

The design of the firm provides the institutional context for the design of the organization. As explained in § 9.2 the design of the firm comprises elements like:

- The purpose or mission of the firm
- The hierarchy of values of the firm
- The policy of the firm with respect to corporate social responsibility and creating shared value
- The incorporation of the firm, its legal organization

- The corporate governance system of the firm
- The capital structure of the firm, the way it is financed
- The organization of the compliance of the firm
- The organization of co-determination
- The organization of the firm as a fiscal entity

Next to the design of the firm are two elements: strategy and the design of the administrative organization of the firm. The reason these are placed parallel in the design process is that a number of institutional requirements to the business of a firm are rather independent or only weakly related to the strategy of the firm. Also, as explained in § 8.6, it may be necessary in order both to develop new strategies or to execute new strategies, that the systemic context is being redesigned to invoke new thinking in the organization, not restricted by old business models and old structures. Therefore the model in figure 14 comprises Bower's revised model for the resource allocation process (Bower & Gilbert 2005b). The design of the administrative organization, which in a certain way can be compared to the former issue of designing the roles and organization of head quarters, comprises:

- Codifying mission and values in objective functions (§ 8.5)
- Information policy, defining the required organization space (§ 8.4)
- Creating the systemic context of the organization, for its elements see (§ 8.6)
- Organizing the various staff departments for constitutional tasks (legal, finance, accounting & control, HR/MD, information policy, strategy/business development, compliance, etc.)

The design of the administrative organization also can be perceived of creating an infrastructure which takes care of legal requirements, compliance issues, etc. so especially creative knowledge workers can concentrate on creating new products, services and creating

customer value. This infrastructure also provides to them essential elements like shared purpose, shared values, which makes it easier to interact with each others on a community base.

The next element of design is the business model(s) of the firm § 7.4. The first element of the business model, the customer value proposition, needs to be translated in the various processes as required to deliver the customer value proposition. The method how to do this is in details elaborated in Kaplan & Norton's *Strategy Maps* (2004), a more precise label for their valuable method how to design processes would be *Execution Maps*. Applying this method creates improved conditions for the required investments in intangible assets compared to the traditional design methods for organization: organization design is as much about creating new organization through investments. By calculating the profit formula the design of a business model needs to be iterated with a number of elements of the administrative organization: costs of capital, costs of resources, etc. As well the firm's values need to be incorporated in the customer value proposition. As well those values and e.g. CSR policy make imply certain constraints in the profit formula as objective function.

Strategy execution may require that investments are needed in new process capabilities, new products and or services, which require resources from multiple departments, including staff departments, shared service centers and third parties. As explained and elaborated by Kaplan & Norton in their *The Execution Premium* (2008) it may be necessary for successful strategy execution to organize such an investments as a strategic theme, that is an accountable entity, crossing the various units and departments, in which resources from the resource units are allocated through STRATEX to the strategic themes, as well as are future benefits of the strategic theme allocated in the rolling forecast of the performance of those units. Hence that in the model in Figure 14 is included the strategic theme as a design element. With that also time has been included in the generic model for organization design. I can be argued that in old organization design the

difference between the short term and long term was included as well where the R&D-departments was included in the design. In this new approach it is acknowledged that development of new knowledge is not any more exclusive for the R&D-department and that new knowledge is generated at multiple places in the organization.

The design of resource configuration for many firms will have an historical component, as this often will be the traditional unit organization, organization form or structure. In the 20th century resource configuration was based on fit-to-market. The fit-to-market now is overtaken by processes, providing more flexibility to create and maintain fit-to-market. Based on the phenomenon of shared service centers in Figure 14 resources are separated in specific resources (specific for products, markets, customers) and generic resources (to be deployed cross multiple product-market combinations: HR-services, logistic services, IT-services, generic manufacturing or assembly services), which either are organized in shared services and or outsourced to third parties. The actual design of resource configuration will be based on (1) a most efficient exploitation of resources (2) a best development of those resources, that is access to new knowledge, the best available knowledge for those resources in the world, self-reinforcing mechanisms to increase the value of those resources etc. In addition to outsourcing, modularity will be a generic tactics to have a best organization of resources.

The design of resource configuration often will be expressed in traditional budget structures, including those of country organizations, and need often be maintained so, but the deployment of resources will be determined by the processes needed to deliver the customer value proposition.

By placing the design of the business model outside the traditional structure based on the resource configuration, the management of market opportunities is separated from the management of resource utilization to contain the bias of underestimating market opportunities if viewed through the lens of resource utilization.

The generic organization model as suggested in figure 14 tries to explain the new way of organization design in relation to traditional organization forms. Existing firms especially not always have the freedom to switch from traditional models into completely new models. In general firms will need to balance between exploitation and exploration. Like the shift from mass production with large batches of standardized products to the extreme of markets of one and production of proto-types only, some suggest that in a dynamic economy business models only are experimental. The reality will be somewhere in between, differing per firm, technology, markets and industry. Also based on the case studies of Kanter, a firm also could be imagined as a stream of business models varying from explorative business experiments to exploitation of business models. This raises the question what then is the identity of the firm and why should investors be willing to invest in such a firm. As business model experimenting will have to do with re-use of knowledge and also of infrastructures, most likely there will be a limited scope of the business experiments in terms of technology, markets, products, services and customers. So strategic choices what to pursue and what not, need to be made. Another element what will set a scope to the business experiments will be the available data. Based on these considerations a dynamic model of the firm and its elements could be depicted as in figure 15.

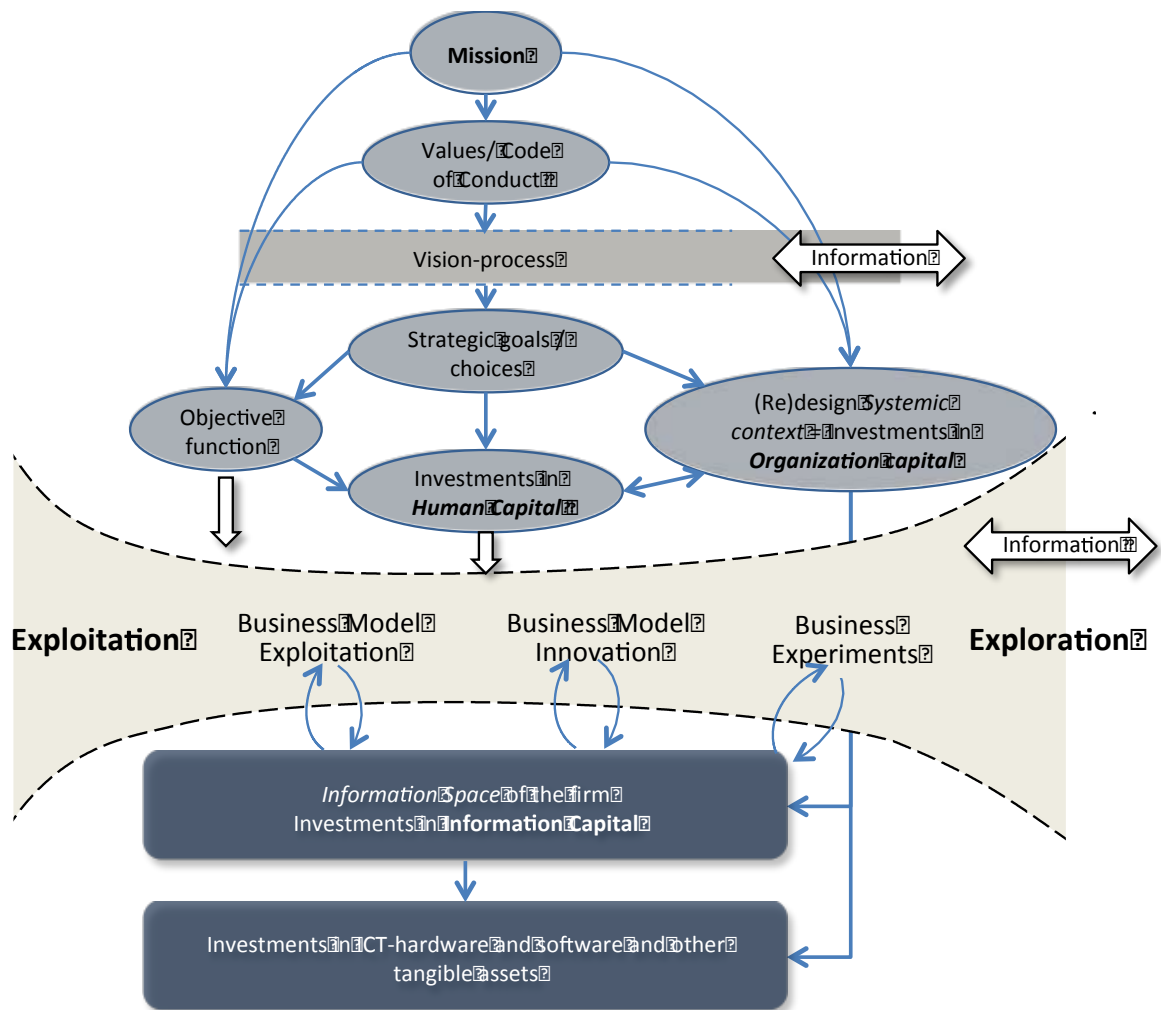


Figure 15. A dynamic model of the firm and its key elements in its internal organization.

In the model in figure 15 there is a combination of dynamics and stability. The stability is vested in two dimensions of the firm. One is in the identity of the firm, expressed in its mission and values, which also serve as a frame to cope with the many opportunities as these grow in an information society and to make choices from those opportunities. The second dimension of stability is in the infrastructures of the firm, especially its information space, supported by ICT, and in its complementarities with other tangible assets, like logistics, sales transaction services etc. The dynamics then is in the process of business experimentation, data driven business experiments, including exploitation to produce cash.

10 Conclusion

It is possible, if not perfect yet, to paint a comprehensive picture on how to design the organization of a firm and its organization. It requires integrative, multidisciplinary system thinking to see the interrelatedness of all the design parameters. By using the business model as a starting point and seeing staff departments and shared service centers as an infrastructure it is possible to avoid a feeling or attitude that designing an organization is a wicked problem, and thus taking recourse to existing models. By understanding changes in assumptions design parameters can be identified which until then were considered to be constraints, thus opening up the use of abductive thinking and creating breakthroughs in efficiency.

Critical in organization design is the design of the design process to overcome psychological barriers to achieve breakthrough designs. A number of barriers to be overcome are to be found in business institutions. Organization design as a process of interpretative learning should be countered by design as a process of explorative learning. As presaged by Peter Drucker and Herbert Simon, the organization of information and factoring of decision making, the objective function, has priority over designing structure, departments etc. Designing organizations along these lines, if not precisely easy in view of all kind of resistance, ill defined regulation and misunderstanding, is the way forward to have a better use of especially intangible resources (*human capital, social capital*), local entrepreneurship and to face uncertainty.

11 Annex: Provisionary overview of sources of design criteria

11.1 Design criteria for the firm

Design dimension	Design parameters	Sources for criteria
The purpose or mission of the firm	Elements to be included or not in a mission statement	<i>Mission</i> : The Mission Statement Handbook (Internet) <i>Purpose</i> : (Mourkogiannis 2006)
The hierarchy of values of the firm	Definition of value, types of value, expressions to be used or not	<i>Hierarchy of values</i> : e.g. (Cha & Edmondson 2006; Collins & Porras 1994; Mourkogiannis 2006)
Corporate social responsibility / creating share value	Ethics codes, business codes, code of conduct, business principles	International Labour Organization, OECD, The Global Reporting Initiative, etc.
The incorporation of the firm, its legal organization	Type of legal form Type of legal structure (parent company, country-holdings, subsidiaries, alliances, etc.) Ownership, system of corporate governance, voting rights, cross membership in boards Articles of association, bylaws, etc.	Publications on: Corporate law (per jurisdiction), e.g. for Germany: (Theisen), UK: (Tricker) General: (Booth 2002) European Corporate Law
The Corporate governance system of the firm	Board structure, committees, board processes, investor relations	Corporate Governance (codes for corporate governance), OECD, per jurisdiction Design of the Board, e.g. (Carter & Lorsch 2004; Leblanc & Gillies 2005) Regulatory rules (per jurisdiction, European Community)
The capital structure, the financing of the firm	Types of debt financing Types of equity financing Choice of financial market	Various handbooks on corporate finance, e.g. (Copeland, Weston, & Shastri 2005; Grinblatt & Titman ; Tirole 2006) Fiscal Law International tax treaties Models for international cash management The nature of (local) financial markets (e.g. availability of venture capital)
The organization of compliance	Corporate policies, training, auditing	
The organization of co-determination		
The organization of the firm as a fiscal entity	Use of special vehicles, incorporation in jurisdictions with specific fiscal regulation	

11.2 Design criteria for the business model

Design dimension	Sources
<p>What solution or value proposition is offered to which customers? Elements of the customer value proposition Value appropriation Control over market position Open or closed business model Open or closed innovation model = access to outside knowledge Capital intensity Degree of vertical integration Revenue model, margin model Type of profit model</p> <p>Organization of the four flows Type of catalyst in double sided markets The catalyst framework</p> <p>In which ways to use information, as a competitive weapon, as a key resource, etc.</p>	<p><i>Business (Model) Design:</i> e.g. (Casadesus-Masanell & Ricart 2011; Johnson, Christensen, & Kagermann 2008; Kaplan & Norton 2004; Kim & Mauborgne 2005; Osterwalder, Pigneur, & Tucci 2005; Slywotzky 1996; Slywotzky & Morrison 1997; Slywotzky et al. 1999) (Chesbrough, Vanhaverbeke, & West 2006) Various publications on eBusiness design, e.g. (Weill & Vitale 2001) (but these authors fail to include the title flow)</p> <p>Various handbooks on Corporate Strategy, incl. e.g. (Evans, Hagi, & Schmalensee 2006; Evans & Schmalensee 2007) (on business design in two-sided markets)</p> <p>(De Kuijper) (on consequences of the vanishing costs of information)</p>

11.3 Design criteria for internal governance

Design dimension	Sources
Codifying mission and values in objective functions	Examples are to be found on the Internet, e.g. on the combination <i>linear programming corporate social responsibility</i> (Goodwin & Wright)
Information policy, defining the required organization space	The existing publications on IT-governance are inadequate, those on management accounting systems are restricted to the first level of control. On the concept of information space: (Boisot 1995)
Creating the systemic context of the organization, for its elements see (§ 8.6)	<p>Handbooks on Organizational Behavior: (French & Bell ; Greenberg & Baron 2003; Rollinson & Broadfield)</p> <p>Management Control: (Anthony & Govindarajan 1995; Merchant & Van der Stede 2003; Simons 2000);</p> <p>The resource allocation process (Bower 1986; Bower & Gilbert 2005a);</p> <p>Strategy execution: Kaplan & Norton, 2004, 2008.</p> <p>Performance measurement and performance evaluation (Simons 2000)</p> <p>Management development (Strebel & Keys 2005), identification, loyalty, team work, performance management infrastructure (Foss 2005), resource</p>

	mobilization (Doz 2005)
Organizing the various staff departments for constitutional tasks (legal, finance, accounting & control, HR/MD, information policy, strategy/business development, compliance, etc.)	Existing publications on the organization of headquarters are based on the M-form or holding organization.

11.4 Design criteria for resource configuration and operational processes

Sources for design parameters and criteria for the level of Internal Governance

Social Organization

Material Organization

Processes	<p>Handbooks on Organizational Behavior:</p> <p>Teamwork, communication, conflict handling, psychological climate, decision making processes, images of man, motivation, etc.</p> <p>(French & Bell ; Greenberg & Baron 2003; Rollinson & Broadfield)</p>	<p>Handbooks on management control: (Anthony & Govindarajan 1995; Merchant & Van der Stede 2003; Simons 2000);</p> <p>The resource allocation process (Bower 1986; Bower & Gilbert 2005a);</p> <p>Strategy execution: Kaplan & Norton, 2004, 2008.</p> <p>Performance measurement and performance evaluation (Simons 2000)</p>
Structure	<p>Literature on:</p> <p>Management development (Strebel & Keys 2005), identification, loyalty, team work, performance management infrastructure (Foss 2005), resource mobilization (Doz 2005)</p>	<p>Chandler (1962) on <i>fit-to-market</i> Brickley <i>at al.</i>, Milgrom & Roberts on the architecture of the firm; including criteria to decide for type of accountability center, also Jensen, but according to Kaplan, due to the decreasing costs of information the distinction between profit centers and costs centers will disappear</p> <p>Strikwerda 2008 on the multidimensional organization, on the organization of shared service centers</p> <p>Arrow (1985) on the organization of information</p> <p>Kaplan & Norton 2008 on how to organize for synergies and cross unit strategic themes</p> <p>Handbooks on management accounting, e.g. Jensen on designing</p>

the objective function, transfer pricing (disappearing)

11.5 Design criteria for the service infrastructure

Design dimension	Sources
Shared Services	(Bangemann 2005; Bergeron 2003; Keuper & Oecking 2008; Strikwerda 2010b)
Business Process Outsourcing	Literature on industrial organization, contract theory

12 References

- Aaker, David A. 2008. *Spanning silos : the new CMO imperative*. Boston, Mass.: Harvard Business School Press.
- Abell, Derek F. 1980. *Defining the Business: The Starting Point of Strategic Planning*. Englewood Cliffs, NJ: Prentice-Hall.
- Alberts, David S. and Richard E. Hayes. 2003. *Power to the edge: command, control in the information age*. Washington, DC: CCRP Publication Series.
- . 2006. *Understanding command and control*. Washington, D.C.: CCRP Publications.
- Alchian, A.A. and H. Demsetz. 1972. "Production, information costs and economic organization." *American Economic Review* 62:777-795.
- Ansoff, H. Igor. 1984. *Implanting Strategic Management*. New York: Prentice Hall.
- Anthony, Robert N. and Vijay Govindarajan. 1995. *Management Control Systems*. Chicago: Irwin.
- Applegate, Lynda M. , Robert D. Austin, and F. Warren McFarlan. 2006. *Corporate Information Strategy and Management: Text and Cases*. New York: Irwin/McGraw Hill.
- Argyris, Chris. 1991. "Teaching Smart People How to Learn." *Harvard Business Review* 69:99-109.
- Argyris, Chris and Donald A. Schön. 1996. *Organizational Learning II: Theory, Method and Practice*. Reading, Mass.: Addison Wesley.
- Arrow, Kenneth J. 1974. *The Limits of Organization*. New York: Norton.
- . 1985. "Informational Structure of the Firm." *The American Economic Review* 75:303-307.
- . 1996. "The Economics of Information: An Exposition." *Empirica* 23:119-128.
- Ashby, W. Ross. 1956. *An Introduction to Cybernetics*, vol. 1999. London: Chapman & Hall.
- Baldwin, Carliss Y. and Kim Clark. 2002a. "The Fundamental Theorem of Design Economics." Harvard Business School Working Paper No. 02-077, Harvard NOM Working Paper No. 02-12.
- . 2002b. "The Option Value of Modularity in Design: An Example from Design Rules, Volume 1: The Power of Modularity." Harvard Business School.
- Bangemann, Tom Olavi. 2005. *Shared Services in Finance and Accounting*. Aldershot: Gower.
- Barnard, Chester I. 1948. *The Functions of the Executive*. Cambridge, Mass.: Harvard University Press.
- Bart, C.K. 1999. "Mission Statement Content and Hospital Performance in the Canadian Not-for-Profit Health Care Sector." *Health Care Management Review* 24:18-29.
- Bazerman, Max H. and Don A. Moore. 2009. *Judgment in managerial decision making*. Hoboken, NJ: John Wiley & Sons.
- Beck, Ulrich and Christoph Lau. 2005. "Second modernity as a research agenda: theoretical and empirical explorations in the 'meta-change' of modern society." *The British Journal of Sociology* 56:525-557.
- Belleflamme, Paul and Martin Peitz. 2010. *Industrial organization : markets and strategies*. New York: Cambridge University Press.
- Beniger, James R. 1986. *The control revolution: technological and economic origins of the information society*. Cambridge, Mass.: Harvard University Press.
- Bergeron, Bryan P. 2003. *Essentials of shared services*. New York: John Wiley & Sons.
- Berle, Adolf Augustus and Gardiner Coit Means. 1932/1991. *The Modern Corporation and Private Property*. New Brunswick, NJ: Transaction Publishers.
- Best, Michael H. 2001. *The New Competitive Advantage: The Renewal of American Industry*. Oxford: Oxford University Press.
- Bettis, Richard A. and C. K. Prahalad. 1995. "The Dominant Logic: Retrospective and Extension." *Strategic Management Journal* 16:5-14.
- Bhidé, Amar V. 2000. *The Origin and Evolution of New Businesses*. Oxford: Oxford University Press.
- Bleicher, Knut. 1992. *Das Konzept Integriertes Management*. Frankfurt: Campus Verlag.

- Böhme, Gernot. 1978. *Die Gesellschaftliche Orientierung des wissenschaftlichen Fortschritts*. Frankfurt am Main: Suhrkamp.
- Boisot, Max H. 1995. *Information Space: A Framework for Learning in Organizations, Institutions and Culture*. London: Routledge.
- Bøllingtoft, Anne, Dorthe Døjbak Håkonsson, Jørn Flohr Nielsen, Charles C. Snow, and John Ulhøi. 2009. "New approaches to organization design : theory and practice of adaptive enterprises." in *Information and organization design series*. New York: Springer.
- Boot, A.W.A. and K. Cools. 2007. "Private equity en activistische aandeelhouders: bestuur onder vuur." in *Private Equity en Aandeelhoudersactivisme*, edited by Koninklijke Vereniging voor de Staatshuishoudkunde Preadviezen 2007.
- Booth, Richard A. 2002. *Form and Function in Business Organizations*: SSRN.
- Bower, Joseph L. 1986. *Managing the Resource Allocation Process*. Boston, Mass.: Harvard Business School Press.
- Bower, Joseph L. and Clark G. Gilbert. 2005a. "From Resource Allocation to Strategy." Pp. xvii, 482 p. Oxford: Oxford University Press.
- . 2005b. "A Revised Model of the Resource Allocation Process." in *From Resource Allocation to Strategy*, edited by J. L. Bower and C. G. Gilbert. Oxford: Oxford University Press.
- Brickley, James A., Clifford W. Smith, and Jerold L. Zimmerman. 2001. *Managerial Economics and Organizational Architecture*. Boston: McGraw-Hill.
- Brynjolfsson, Erik and Lorin M. Hitt. 2003. "Computing Productivity: Firm Level Evidence." MIT Sloan School of Management.
- Brynjolfsson, Erik, Lorin M. Hitt, and Heekyung H. Kim. 2011. "Strength in Numbers: How Does Data-Driven Decisionmaking Affect Firm Performance?" *SSRN eLibrary*.
- Brynjolfsson, Erik, Lorin M. Hitt, and Shinkyu Yang. 2002a. "Intangible Assets: Computers and Organizational Capital." *Brookings Papers on Economic Activity* 2002:137-181.
- . 2002b. "Intangible Assets: How the Interaction of Computers and Organizational Structure Affects Stock Market Valuations." Brookings Panel on Economic Activity.
- Brynjolfsson, Erik and Adam Saunders. 2010. *Wired for innovation : how information technology is reshaping the economy*. Cambridge, Mass.: MIT Press.
- Buchanan, David and Andrzej Huczynski. 2004. *Organizational Behaviour*. Harlow, England: Financial Times-Prentice Hall.
- Burgelman, Robert A., Clayton M. Christensen, and Steven C. Wheelwright. 2009. *Strategic management of technology and innovation*. Boston: McGraw-Hill Irwin.
- Burton, Richard M., Bo H. Eriksen, Dorthe Døjbak Håkonsson, Thorbjørn Knudsen, and Charles C. Snow. 2008. "Designing organizations : 21st century approaches." in *Information and organization design series*. New York: Springer.
- Burton, Richard M. and Børge Obel. 2004. *Strategic Organizational Diagnosis and Design: The Dynamics of Fit*. Boston: Kluwer Academic Publishers.
- Carlsson, Christer and Robert Fullér. 1996. "Fuzzy multiple criteria decision making: Recent developments." *Fuzzy Sets and Systems* 78:139-153.
- Carlton, Dennis W. and Jeffrey M. Perloff. 2000. *Modern Industrial Organization*. Reading, Mass.: Addison-Wesley.
- Carter, Colin B. and Jay W. Lorsch. 2004. *Back to the Drawing Board: Designing Corporate Boards for a Complex World*. Boston, Mass.: Harvard Business School Press.
- Casadesus-Masanell, Ramon and Joan E. Ricart. 2011. "How to Design A Winning Business Model." *Harvard Business Review* 89:100-107.
- Casson, Mark. 1998. "An Entrepreneurial Theory of the Firm." Department of Economics - University of Reading, Reading.
- Cha, Sandra E. and Amy C. Edmondson. 2006. "When values backfire: Leadership, attribution, and disenchantment in a values-driven organization." *The Leadership Quarterly* 17:57-78.

- Chandler, Alfred D. 1962. *Strategy and Structure: Chapters in the History of American Enterprise*. Cambridge, MA: MIT Press.
- . 1977. *The Visible Hand: The Managerial Revolution in American Business*. Cambridge, Mass.: The Belknap Press of Harvard University Press.
- . 2001. *Inventing the Electronic Century: The Epic Story of the Consumer Electronics and Computer Industry*. New York: The Free Press.
- Chang, Dempsey, Laurence Dooley, and Juhani E. Tuovinen. 2002. "Gestalt Theory in Visual Screen Design-A New Look at an Old Subject." in *Seventh World Conference on Computers in Education*. Copenhagen.
- Chesbrough, Henry. 2003. "Towards a Dynamics of Modularity: A Cyclical Model of Technical Advance." in *The Business of System Integration*, edited by A. Prencipe, A. Davies, and M. Hobday. Oxford: Oxford University Press.
- Chesbrough, Henry, Wim Vanhaverbeke, and Joel West. 2006. "Open Innovation: Researching a New Paradigm." Oxford: Oxford University Press.
- Chesbrough, Henry W. 2006. *Open Business Models: How to Thrive in the New Innovation Landscape*. Boston, Mass: Harvard Business School Press.
- Christensen, Clayton M. 1997. *The Innovators Dilemma: When New Technologies Cause Great Firms to Fail*. Boston, Mass.: Harvard Business School Press.
- Christensen, Clayton M. and Michael E. Raynor. 2003. *The innovator's solution: creating and sustaining successful growth*. Boston, Mass.: Harvard Business School Press.
- Coase, Ronald H. 1937. "The Nature of the Firm." in *The Nature of the Firm: Origins, Evolution, and Development*, edited by O. E. Williamson and S. G. Winter. New York: Oxford University Press (1991).
- Collins, James C. and Jerry I. Porras. 1994. *Built to Last: Successful Habits of Visionary Companies*. New York: HarperBusiness.
- Collins, Jim. 2001. *Good to Great: Why Some Companies Make the Leap ... and Others Don't*. London: Random House Business Books.
- Copeland, Thomas E., J. Fred Weston, and Kuldeep Shastri. 2005. *Financial theory and corporate policy*. Boston, MA: Addison-Wesley.
- Copeland, Tom, Tim Koller, and Jack Murrin. 2000. *Valuation: Measuring and Managing the Value of Companies*. New York: Wiley.
- Daft, Richard L. 1998. *Organization Theory and Design*. Cincinnati, O.: South-Western College Publishing.
- Dale, Ernest. 1960. *The Great Organizers*. New York: McGraw-Hill.
- Davenport, Thomas H. 1998. "Putting the Enterprise into the Enterprise System." *Harvard Business Review* 76:121-131.
- Davenport, Thomas H., Laurence Prusak, and H. James Wilson. 2003. *What's the big idea?: creating and capitalizing on the best management thinking*. Boston, Mass.: Harvard Business School Press.
- Davis, Gerald F. and Christopher Marquis. 2005. "Prospects for Organization Theory in the Early Twenty-First Century: Institutional Fields and Mechanisms." *Organization Science* 16:332-343.
- Davis, Stanley M. 1979. *Managing and Organizing Multinational Corporations*. New York: Pergamon Press.
- Davis, Stanley M. and Paul R. Lawrence. 1978. "Problems of matrix organizations." *Harvard Business Review* 56:131-142.
- De Kuijper, Mia. 2009. *Profit power economics : a new competitive strategy for creating sustainable wealth*. Oxford ; New York: Oxford University Press.
- Deal, Terrence E. and Allen A. Kennedy. 1982. *Corporate Cultures: The Rites and Rituals of Corporate Life*. Reading, Mass.: Addison-Wesley.

- Denyer, David, David Tranfield, and Joan Ernst van Aken. 2008. "Developing Design Propositions through Research Synthesis." *Organization Studies* 29:393-413.
- DiMaggio, Paul J. and Walter W. Powell. 1983. "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields." *American Sociological Review* 48:147-160.
- Dolan, Shimon L. and Salvador García Sánchez. 2000. "Managing by Values in the Next Milenium: Cultural Redesign for Strategic Organizational Change." *SSRN eLibrary*.
- Donaldson, Gordon. 1994. *Corporate Restructuring: Managing the Change Process from Within*. Boston, Mass.: Harvard Business School Press.
- Doz, Yves L. 2005. "Resource Allocation Processes in Multidimensional Organizations: MNCs and Alliances." in *From Resource Allocation to Strategy*, edited by J. L. Bower and C. G. Gilbert. Oxford: Oxford University Press.
- Drucker, Peter F. 1958. "Business Objectives and Survival Needs: Notes on a Discipline of Business Enterprise." *The Journal of Business* 31:81-90.
- . 1973. *Management: Tasks, Responsibilities, Practices*. New York: Harper & Row.
- . 1988. "The Coming of the New Organization." *Harvard Business Review*.
- Dunbar, Roger L. M. and William H. Starbuck. 2006. "Learning to Design Organizations and Learning from Designing Them." *Organization Science* 17:171-178.
- Durand, Jean-Pierre. 2004. *La Chaîne invisible: Travailler aujourd'hui: flux tendu et servitude volontaire*. Paris: Éditions du Seuil.
- Dyer, James S., Peter C. Fishburn, Ralph E. Steuer, Jyrki Wallenius, and Stanly Zionts. 1992. "Multiple Criteria Decision Making, Multiattribute Utility Theory: The Next Ten Years." *Management Science* 38:645-654.
- Eikelenboom, Siem and Gaby de Groot. 2011. "Nederland fiscaal zeer in trek." in *Financieel Dagblad*. Amsterdam.
- Ethiraj, Sendil K. and Daniel A. Levinthal. 2004a. "Bounded Rationality and the Search for Organizational Architecture: An Evolutionary Perspective on the Design of Organizations and Their Evolvability." *SSRN eLibrary*.
- Ethiraj, Sendil K. and Daniel A. Levinthal. 2004b. "Bounded Rationality and the Search for Organizational Architecture: An Evolutionary Perspective on the Design of Organizations and Their Evolvability." *Administrative Science Quarterly* 49:404-437.
- Etzioni, Amitai. 1988. *The Moral Dimension: Towards A New Economics*. New York: The Free Press.
- Evans, David S., Andrei Hagiu, and Richard Schmalensee. 2006. *Invisible engines : how software platforms drive innovation and transform industries*. Cambridge, Mass.: MIT Press.
- Evans, David S. and Richard Schmalensee. 2007. *Catalyst Code: The Strategies Behind the World's Most Dynamic Companies*. Boston, MA: Harvard Business School Press.
- Fama, Eugene F. and Michael C. Jensen. 1998 (org. 1983). "Separation of Ownership and Control." in *Foundations of Organizational Strategy*, edited by M. C. Jensen. Cambridge, Mass.: Harvard University Press.
- Fayol, Henry. 1918/1999. *Administration Industrielle et Générale*. Paris: Dunod.
- Foss, Nicolai J. 2005. "The Knowledge Governance Approach." *SSRN eLibrary*.
- French, Wendell L. and Cecil H. Bell. 1999 [1978]. *Organizational Development: Behavioral Science Interventions for Organization Improvement*. Upper Saddle River: Prentice Hall.
- Furubotn, Eirik G. and Rudolf Richter. 2000. *Institutions and Economic Theory: The Contribution of the New Institutional Economics*, Edited by T. Kuran. Ann Arbor: The University of Michigan Press.
- Galbraith, J. 1973. *Designing Complex Organizations*. Reading, Mass.; Addison-Wesley.
- Galbraith, Jay R. 2002. *Designing Organizations: An Executive Guide to Strategy, Structure, and Process*. San Fransico, CA.: Jossey-Bass.
- . 2005. *Designing the Customer-Centric Organization: A Guide to Strategy, Structure, and Process*. San Francisco: Jossey-Bass.

- . 2009. *Designing matrix organizations that actually work : how IBM, Procter & Gamble, and others design for success*. San Francisco, CA: Jossey-Bass.
- Garfinkel, Harold. 2008. *Toward a sociological theory of information*. Boulder, Colo.: Paradigm Publishers.
- Gellerman, S.W. 1990. "In Organization, as in Architecture, Form Follows Function." *Organization Development*:57-68.
- Gomes-Casseres, Benjamin. 1996. *The Alliance Revolution: The New Shape of Business Rivalry*. Cambridge, Mass.: Harvard University Press.
- Goodwin, Paul and George Wright. 2010. *Decision Analysis for Management Judgment*. Hoboken: Wiley.
- Goold, Michael and Andrew Campbell. 2002. *Designing Effective Organizations: How to Create Structured Networks*. San Fransisco, CA: Jossey-Bass.
- Gorton, Gary. 2009. "The Subprime Panic." *European Financial Management* 15:10-46.
- Grandori, Anna. 1997. "Governance Structures, Coordination Mechanisms and Cognitive Models." *The Journal of Management and Governance* 1:29-47.
- Grandori, Anna and Giuseppe Soda. 2006. "A Relational Approach to Organization Design." *Industry and Innovation* 13:151-172.
- Grant, Robert M. 2002. *Contemporary Strategy Analysis: Concepts, techniques, application*. Oxford: Blackwell.
- Greenberg, Jerald. 2010. *Managing Behavior in Organizations*. Upper Saddle River, NJ: Prentice Hall.
- Greenberg, Jerald and Robert A. Baron. 2003. *Behavior in Organizations: Understanding and Managing the Human Side of Work*. Upper Saddle River, NJ: Prentice-Hall.
- Greif, Avner. 2006. *Institutions and the path to the modern economy : lessons from medieval trade*. Cambridge ; New York: Cambridge University Press.
- Grinblatt, Mark and Sheridan Titman. 2002. *Financial Markets and Corporate Strategy*. Boston: McGraw-Hill.
- Hamel, Gary and C.K. Prahalad. 1994. *Competing for the Future*. Boston, Mass.: Harvard Business School Press.
- Hammer, Michael and James Champy. 1993. *Reengineering the Corporation: A Manifesto for Business Revolution*. New York: HarperBusiness.
- Hannan, Michael T., László Pólos, and Glenn Carroll. 2007. *Logics of organization theory : audiences, codes, and ecologies*. Princeton, N.J.: Princeton University Press.
- Hardt, Michael and Antonio Negri. 2004. *Multitude: War and Democracy in the Age of Empire*. New York: Penguin Books.
- Harris, Milton and Artur Raviv. 2000. "Organization Design." *SSRN eLibrary*.
- Haslam, S. Alexander. 2004. *Psychology in Organizations: The Social Identity Approach*. London: SAGE publications.
- Hayek, Friedrich. 1945. "The Use of Knowledge in Society." *American Economic Review* XXXV:519-30.
- Heritier, Adrienne and Soriano, Leonor Moral, "Differentiating and Linking Politics and Adjudication. The Example of European Electricity Policy" (2001). MPI Collective Goods Preprint No. 2001/16. <http://ssrn.com/abstract=299443>.
- Hofstede, Geert H. 1980. *Culture's consequences : international differences in work-related values*. Beverly Hills, Calif.: Sage Publications.
- Holbrook, Morris B. 2006. "Consumption experience, customer value, and subjective personal introspection: An illustrative photographic essay." *Journal of Business Research* 59:714-725.
- Illing, Gerhard and Martin Peitz. 2006. *Industrial organization and the digital economy*. Cambridge, Mass.: MIT Press.
- James, William. 2005. *Pragmatisme: Een nieuwe naam voor enkele oude denkwijzen*. Translated by R. Gerritsen. Diemen: Veen Magazines.

- Jensen, Michael C. 1983. "Organization Theory and Methodology." *The Accounting Review* 58:319-339.
- . 1998. *Foundations of organizational strategy*. Cambridge, Mass.; Harvard University Press.
- . 2000a. *A Theory of the Firm: Governance, Residual Claims, and Organizational Forms*. Cambridge, Mass.: Harvard University Press.
- . 2000b. "Value Maximalization and the Corporate Objective Function." Pp. 37-57 in *Breaking the Code of Change*, edited by M. Beer and N. Nohria. Boston, Mass.: Harvard Business School Press.
- . 2001a. "Corporate Budgeting Is Broken, Let's Fix It." *Harvard Business Review*.
- . 2001b. "Value Maximization, Stakeholder Theory, and the Corporate Objective Function." *Journal of Applied Corporate Finance* Fall:17.
- . 2004. "Issues and Puzzles in Performance Management (pdf file of Powerpoint Slides)." Available at SSRN: <http://ssrn.com/abstract=709561>.
- . 2007. *The Economic Case for Private Equity (pdf of Keynote Slides)*: SSRN.
- Jensen, Michael C. and William H. Meckling. 1998. "The Nature of Man." in *Foundations of Organizational Strategy*, edited by M. C. Jensen. Cambridge MA: Harvard University Press.
- . 1999. "Coordination, Control and the Management of Organizations: Course Notes." Harvard Business School.
- Jensen, Michael C., Kevin J. Murphy, and Eric G. Wruck. 2004. "Remuneration: Where We've Been, How We Got to Here, What are the Problems, and How to Fix Them." SSRN.
- Johnson, Gerry, Kevan Scholes, and Richard Whittington. 2005. *Exploring Corporate Strategy*. London: Prentice Hall.
- Johnson, Mark W., Clayton M. Christensen, and Henning Kagermann. 2008. "Reinventing Your Business Model." *Harvard Business Review* 86:50-59.
- Jorgenson, Dale W. 2001. "Information Technology and the U.S. Economy." *The American Economic Review* 91:1-32.
- Kahraman, Cengiz. 2008. "Fuzzy multi-criteria decision-making : theory and applications with recent developments." in *Springer optimization and its applications*. New York: Springer.
- Kaplan, Robert S. 2007. "The Demise of Cost and Profit Centers." Harvard Business School Publishing, Boston MA.
- Kaplan, Robert S. and David P. Norton. 2004. *Strategy Maps: Converting Intangible Assets into Tangible Outcomes*. Boston, Mass: Harvard Business School Press.
- . 2005. "The Office of Strategy Management." *Harvard Business Review* 1-11.
- . 2008. *The execution premium: Linking strategy to operations for competitive advantage*. Boston, Mass.: Harvard Business Press.
- Katz, Daniel and Robert L. Kahn. 1966. *The Social Psychology of Organizations*. New York: Wiley.
- Kay, John. 2009. "The Rationale of the Market Economy: A European Perspective." *Capitalism and Society* 4:Article 1.
- Keen, P.G.W. 1991. *Shaping the Future: Business Design through Information Technology*. Boston, Mass.: Harvard Business School Press.
- Keuper, Frank and Christian Oecking. 2008. "Corporate Shared Services: Bereitstellung von Dienstleistungen im Konzern / [Siemens]." Wiesbaden: Gabler.
- Kim, W. Chan and René Mauborgne. 2005. *Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant*. Boston, Mass.: Harvard Business School Press
- Kogut, Bruce and Edward H. Bowman. 1995. "Modularity and Permeability as Principles of Design." in *Redesigning the Firm*, edited by E. H. Bowman and B. M. Kogut. New York: Oxford University Press.
- Landes, David S., Joel Mokyr, and William J. Baumol. 2010. "The invention of enterprise : entrepreneurship from ancient Mesopotamia to modern times." Pp. xiii, 566 p. in *Kauffman Foundation series on innovation and entrepreneurship*. Princeton, N.J.: Princeton University Press.

- Langlois, Richard N. 2002. "The Vanishing Hand: the Changing Dynamics of Industrial Capitalism." The University of Connecticut.
- Lash, Scott. 2002. *Critique of information*. London ; Thousand Oaks, Calif.: SAGE.
- Lawler, Edward E. and Christopher G. Worley. 2006. *Built to Change: How to Achieve Sustained Organizational Effectiveness*. San Francisco CA: Jossey-Bass.
- Lawrence, Paul R. and Jay W. Lorsch. 1969. *Organization and environment: Managing Differentiation and Integration*. Homewood, Ill.: Irwin.
- Leblanc, Richard and James Gillies. 2005. *Inside the Boardroom: How Boards really work and the coming revolution in corporate governance*. Mississauga, Ont.: Wiley.
- Levinthal, Daniel A. and James G. March. 1993. "The Myopia of Learning." *Strategic Management Journal* 14:95-112.
- Lewin, Arie Y. and Henk W. Volberda. 2003. "The future of organization studies: Beyond the selection-adaptation debate." in *The Oxford Handbook of Organization Theory: Meta-theoretical perspectives* edited by H. Tsoukas and C. Knudsen. Oxford: Oxford University Press.
- Lidwell, William, Kritina Holden, and Jill Butler. 2003. *Universal principles of design*. Gloucester, Mass.: Rockport.
- Luhmann, Niklas. 1968. *Vertrauen: Ein Mechanismus der Reduktion sozialer Komplexität*. Stuttgart: Lucius & Lucius.
- Lynskey, Michael J. and Seiichiro Yonekura. 2002. "Entrepreneurship and Organization: The Role of the Entrepreneur in Organizational Innovation." Oxford: Oxford University Press.
- Malhotra, Deepak K. and Max H. Bazerman. 2005. *Economics Wins, Psychology Loses, and Society Pays*: SSRN.
- March, James G. 1991. "Exploration and Exploitation in Organizational Learning." *Organization Science* 1:71-87.
- . 1994. *A Primer on Decision Making: How Decisions Happen*. New York: The Free Press.
- . 2006. "Rationality, Foolishness, and Adaptive Intelligence." *Strategic Management Journal* 201-214.
- Martin, Roger L. 2007. "The opposable mind : how successful leaders win through integrative thinking." Pp. xii, 210 p. Boston, Mass.: Harvard Business School Press.
- . 2009. *The design of business : why design thinking is the next competitive advantage*. Boston, Mass.: Harvard Business Press.
- Medema, Steven G. 2009. "The hesitant hand : taming self-interest in the history of economic ideas." Pp. xiii, 230 p. Princeton, N.J.: Princeton University Press.
- Merchant, Kenneth A. and Wim A. Van der Stede. 2003. *Management Control Systems: Performance Measurement, Evaluation and Incentives*. London: Prentice Hall.
- Meyer, J.W. 1994. "Social Environments and Organizational Accounting." in *Institutional Environments and Organizations*, edited by W. R. Scott and J. W. Meyer. Thousands Oaks: Sage.
- Miles, Raymond E. and Charles C. Snow. 1994. *Fit, Failure, and the Hall of Fame: How Companies Succeed or Fail*. New York: The Free Press.
- Milgrom, Paul and John Roberts. 1992. *Economics, Organization and Management*. Englewood Cliffs, NJ: Prentice-Hall.
- Mishkin, Frederic S. 2003. *The Economics of Money, Banking, and Financial Markets*. Boston: Addison-Wesley.
- Morabito, Joseph, Ira Sack, and Anilkumar Bhate. 1999. *Organization Modeling: Innovative Architectures for the 21st Century*. Upper Saddle River: Prentice Hall.
- Motta, Massimo. 2004. *Competition Policy: Theory and Practice*. Cambridge: Cambridge University Press.
- Mourkogiannis, Nikos. 2006. *Purpose: The starting point of great companies*. New York: Palgrave.
- Mullins, Laurie J. 2002. *Management and Organisational Behaviour*. London: Prentice-Hall.

- Nadler, David A. and Michael L. Trushman. 1997. *Competing by Design: The Power of Organizational Architecture*. Oxford: Oxford University Press.
- North, Douglass C. 1991. "Institutions." *The Journal of Economic Perspectives* 5:97-112.
- Osterwalder, Alexander. 2004. "The Business Model Ontology: A Proposition in a Design Science Approach." *l'Ecole des Hautes Etudes Commerciales, Université de Lausanne, Lausanne*.
- Osterwalder, Alexander, Yves Pigneur, and Christopher L. Tucci. 2005. "Clarifying Business Models: Origins, Present, and Future of the Concept." *Communications of AIS* 15.
- Ouchi, William G. 1979. "A Conceptual Framework for the Design of Organizational Control Mechanisms." *Management Science* 25:833-848.
- Palmisano, Samuel J. 2006. "The Globally Integrated Enterprise." *Foreign Affairs* 85:127-136.
- Penrose, Edith Tilton. 2009. *The theory of the growth of the firm*. Oxford ; New York: Oxford University Press.
- Peursen, C.A. van, C.P. Bertels, and D. Nauta. 1968. *Informatie - Een interdisciplinaire studie*. Utrecht: Aula-boeken.
- Pfeffer, Jeffrey and Robert I. Sutton. 2006. *Hard Facts, Dangerous Half-Truths, and Total Nonsense: Profiting from Evidence-Based Management*. Boston, MA: Harvard Business School Press.
- Picot, Arnold, Helmut Dietl, and Egon Franck. 2005. *Organisation: Eine ökonomische Perspektive*. Stuttgart: Schäffer-Poeschel Verlag.
- Porter, Michael E. and Mark R. Kramer. 2011. "Creating Shared Value." *Harvard Business Review* 89:62-77.
- Powell, Thomas C. and Anne Dent-Micallef. 1997. "Information Technology as Competitive Advantage: The Role of Human, Business, and Technology Resources." *Strategic Management Journal* 18:375-405.
- Prahalad, C. K. and M. S. Krishnan. 2008. *The new age of innovation : driving cocreated value through global networks*. New York: McGraw-Hill.
- Prahalad, C.K. and Richard A. Bettis. 1996. "Dominant Logic." Pp. 398-420 in *Managing the Multibusiness Company*, edited by M. Goold and K. S. Luchs. London: Routledge.
- Prahalad, C.K. and Venkat Ramaswamy. 2004. *The Future of Competition: Co-Creating Unique Value with Customers*. Boston, Mass.: Harvard Business School Press.
- Pratt, John W. and Richard J. Zeckhauser. 1991. "Principals and agents : the structure of business." Pp. xii, 241 p. in *Research colloquium*. Boston, Mass.: Harvard Business School Press.
- Prencipe, Andrea, Andrew Davies, and Michael Hobday. 2003. "The Business of Systems Integration." Oxford: Oxford University Press.
- Presthus, Robert. 1962. *The Organizational Society*. New York: Alfred A. Knopf.
- Pugh, D.S., D.J. Hickson, C.R. Hinings, and C. Turner. 1969. "The Context of Organization Structures." *Administrative Science Quarterly* 14:91-114.
- Puranam, Phanish, Marlo Goetting, and Thorbjorn Knudsen. 2010. "Interdependence, Information Processing, and Organization Design: An Epistemic Perspective." *SSRN eLibrary*.
- Putterman, Louis and Randall S. Kroszner. 1996. "The Economic Nature of the Firm (a reader)." Cambridge: Cambridge University Press.
- Quinn, James Brian. 1992. *Intelligent Enterprise: A Knowledge and Service Based Paradigm for Industry*. New York: The Free Press.
- Rajan, Raghuram G. and Luigi Zingales. 2001. "The Influence of the Financial Revolution on the Nature of Firms." *CRSP Working Paper No. 525*. <http://ssrn.com/abstract=259537>.
- Rajan, Raghuram G. and Luigi Zingales. 1998. "The Firm as a Dedicated Hierarchy: A Theory of the Origin and Growth of Firms." <http://ssrn.com/abstract=139707>.
- . 2000. "The governance of the new enterprise." National Bureau of Economic Research, Cambridge MA.

- Roberts, John. 2004. *The Modern Firm: Organizational Design for Performance and Growth*. Oxford: Oxford University Press.
- Robinson, David T. . 2001. "Strategic Alliances and the Boundaries of the Firm." *Columbia University Working Paper*.
- Rollinson, Derek and Aysen Broadfield. 2002. *Organisational behaviour and analysis : an integrated approach*. New York: Prentice Hall Financial Times.
- Rosen, Sherwin. 2004. *Markets and Diversity*. Cambridge, Mass.: Harvard University Press.
- Sadler, Philips. 1998. *Designing Organizations: The Foundation for Excellence*. London: Kogan Page.
- Saly, Aart Willem. 2011. "Uitdagingen bij het innoveren van business modellen." *Holland Management Review* 135:2-11.
- Sarasvathy, Saras D., Nicholas Dew, Stuart Read, and Robert Wiltbank. 2008. "Designing Organizations that Design Environments: Lessons from Entrepreneurial Expertise." *Organization Studies* 29:331-350.
- Schein, Edgar H. 1999. *The Corporate Culture Survival Guide: Sense and Nonsense About Culture Change*. San Francisco: Jossey-Bass Publishers.
- . 2000. "Sense and Nonsense About Culture and Climate." in *Handbook of organizational culture and climate*, edited by N. M. Ashkanasy, C. P. M. Wilderom, and M. F. Peterson. Thousand Oaks: Sage Publications.
- Schumpeter, J. 1926. *Theorie der wirtschaftlichen Entwicklung*. München/Leipzig.
- Scott, W. Richard. 2003. *Organizations: Rational, Natural, and Open Systems*. Upper Saddle River, NJ: Prentice Hall.
- Scott, W. Richard and Søren Christensen. 1995. *The institutional construction of organizations : international and longitudinal studies*. Thousand Oaks, Calif.: Sage Publications.
- Shapiro, Carl and Hal R. Varian. 1999. *Information Rules: A Strategic Guide to the Network Economy*. Boston, Mass.: Harvard Business School Press.
- Shy, Oz. 2001. *The Economics of Network Industries*. Cambridge: Cambridge University Press.
- Siggelkow, Nicolaj and Jan W. Rivkin. 2005. "Speed and Search: Designing Organizations for Turbulence and Complexity." *Organization Science* 16:101-122.
- Simon, Herbert A. 1945/1997. *Administrative behavior : a study of decision-making processes in administrative organizations*. New York: Free Press.
- . 1962. "The Architecture of Complexity." *Proceedings of the American Philosophical Society* 106:467-482.
- . 1973. "The organization of complex systems." Pp. 3-27 in *Hierarchy Theory: The Challenge of Complex Systems*, edited by H. Pattee. New York: Georg Braziller.
- . 1991. "Organizations and Markets." *Journal of Economic Perspectives* 5:25-44.
- . 1996. *The Sciences of the Artificial*. Cambridge, Mass.: The MIT Press.
- Simons, Robert. 1995. *Lever of Control: How Managers Use Innovative Control Systems to Drive Strategic Renewal*. Boston, Mass.: Harvard Business School Press.
- . 2000. *Performance Measurement & Control Systems for Implementing Strategy*. Upper Saddle River, NJ: Prentice Hall.
- . 2005. *Lever of Organization Design: How Managers Use Accountability Systems for Greater Performance And Commitment*. Boston, Mass.: Harvard Business School Press.
- Sloan, Alfred P. 1962/1986. *My Years with General Motors*. Hammondsworth: Penguin Books.
- Slywotzky, Adrian J. 1996. *Value Migration: How to Think Several Moves Ahead of the Competition*. Boston, Mass.: Harvard Business School Press.
- Slywotzky, Adrian J. and David J. Morrison. 1997. *The profit zone: How strategic business design will lead you to tomorrow's profits*. New York: Times Books.
- Slywotzky, Adrian J., David J. Morrison, Ted Moser, Kevin A. Mundt, and James A. Quella. 1999. *Profit Patterns: 30 Ways to Anticipate and Profit from Strategic Forces Reshaping Your Business*. New York: Wiley.

- Stachle, Wolfgang H. 1991. *Management: Eine verhaltenswissenschaftliche Perspektive*. München: Franz Vahlen.
- Stanford, Naomi. 2007. *Guide to organisation design : creating high-performing and adaptable enterprises*. London: Economist.
- Stinchcombe, Arthur L. 1990. *Information and organizations*. Berkeley: University of California Press.
- Strebel, Paul and Tracey Keys. 2005. "Mastering Executive Education: How to combine content with context and emotion-The IMD Guide ". London: FT Prentice Hall.
- Strikwerda, Hans. 2011. "Competing on Information: An Exploration of Concepts." *SSRN eLibrary*.
- Strikwerda, J. 1998. "Het Management Charter." *Nijenrode Management Review* 3:33-47.
- . 2005. *Growth, Governance and Organisation: On power strategy and modular organisation*. Assen-Utrecht: Van Gorcum - NNC.
- . 2008. *Van unitmanagement naar multidimensionale organisaties*. Assen - Den Haag: Van Gorcum - Stichting Management Studies.
- . 2009. "How to Combine a Group Strategy with Subsidiary Governance?" *SSRN eLibrary*.
- . 2010a. "Command & Control in the Multidimensional Organization." *SSRN eLibrary*.
- . 2010b. "Shared service centers 2.0." *Holland Management Review* 27:50-56.
- . 2010c. *Shared Service Centers II: Van kostenbesparing naar waardecreatie*. Assen/ Den Haag: Van Gorcum/ Stichting Management Studies.
- Strikwerda, J. and J. W. Stoelhorst. 2009. "The Emergence and Evolution of the Multidimensional Organization." *California Management Review* 51:11-31.
- Sull, Donald N. 2005. "No Exit: The Failure of Bottom-up Strategic Processes and the Role of Top-down Disinvestment." Pp. 133-175 in *From Resource Allocation to Strategy* edited by J. L. Bower and C. G. Gilbert. Oxford: Oxford University Press.
- Sutcliffe, Kathleen M. and Klaus Weber. 2003. "The High Cost of Accurate Knowledge." *Harvard Business Review* 81:74-82.
- Swedberg, Richard. 2003. "Economic versus sociological approaches to organization theory." in *The Oxford Handbook of Organization Theory: Meta-theoretical perspectives* edited by H. Tsoukas and C. Knudsen. Oxford: Oxford University Press.
- Takeishi, Akira and Takahiro Fujimoto. 2003. "Modularization in the Car Industry: Interlinked Multiple Hierarchies of Product, Production, and Supplier Systems." in *The Business of Systems Integration*, edited by A. Prencipe, A. Davies, and M. Hobday. Oxford: Oxford University Press.
- Talisse, Robert B. and Scott F. Aikin. 2011. "The pragmatism reader : from Peirce through the present." Princeton, N.J.: Princeton University Press.
- Tapscott, Don, David Ticoll, and Alex Lowy. 2000. *Digital Capital: Harnessing the Power of Business Webs*. Boston, Mass.: Harvard Business School Press.
- Theisen, Manuel René. 2000. *Der Konzern: Betriebswirtschaftliche und rechtliche Grundlagen der Konzernunternehmung*. Stuttgart: C.E. Poeschel Verlag.
- Tirole, Jean. 2006. *The Theory of Corporate Finance*. Princeton: Princeton University Press.
- Tricker, R.I. 1994. *International Corporate Governance*. New York: Prentice Hall.
- Tsoukas, Haridimos and Christian Knudsen. 2003. *The Oxford handbook of organization theory*. Oxford; New York: Oxford University Press.
- Vaassen, E. H. J., Roger Meuwissen, and Caren Schelleman. 2009. *Accounting information systems and internal control*. Hoboken, NJ: John Wiley & Sons.
- van Ark, B., Janet Hao, and Charles Hulten. 2009. "Measuring Intangible Capital and its Contribution to Economic Growth in Europe." The Conference Board, New York.
- van Ark, Bart and Kirsten Jäger. 2010. "Intangible Capital in the Netherlands and its Implications for Future Growth." The Conference Board/Dutch Innovation Platform, New York/The Hague.

- van Rooijen-Horsten, Myriam, Dirk van den Bergen, and Murat Tanriseven. 2008. "Intangible capital in the Netherlands: A benchmark." CBS, Voorburg/Heerlen.
- Varian, Hal R., Joseph Farrell, and Carl Shapiro. 2004. *The economics of information technology : an introduction*. Cambridge ; New York: Cambridge University Press.
- Visscher, Klaasjan and Irene Visscher-Voerman. 2010. "Organizational design approaches in management consulting." *Management Decision* 48.
- Wall, Friederike. 2006. *Informationsmanagement - Eine ökonomische Integration von Controlling und Wirtschaftsinformatik*. München: Verlag Franz Vahlen.
- Weick, Karl E. 1982. *The social psychology of organizing*. Reading, Mass.,: Addison-Wesley.
- . 1995. *Sensemaking in organizations*. Thousand Oaks, Calif.,: Sage.
- Weick, Karl E., Kathleen M. Sutcliffe, and David Obstfeld. 2005. "Organizing and the Process of Sensemaking." *Organization Science* 16:409-421.
- Weill, Peter and Jeanne W. Ross. 2004. *IT Governance: How Top Performers Manage IT Decision Rights for Superior Results*. Boston, MA: Harvard Business School Press.
- Weill, Peter and Michael R. Vitale. 2001. *Place to Space: Migrating to eBusiness Models*. Boston, Mass.: Harvard Business School Press.
- Whetten, David, Gordon Rands, and Paul Godfrey. 2002. "What Are the Responsibilities of Business to Society?" in *Handbook of Management and Strategy*, edited by A. M. Pettigrew, H. Thomas, and R. Whittington. London ; Thousand Oaks, Calif.: Sage Publications.
- Wilhelm, William J. and Joseph D. Downing. 2001. *Information Markets: What Business Can Learn from Financial Innovation*. Boston, Mass.: Harvard Business School Press.
- Williamson, Oliver E. 1975. *Markets and Hierarchies: Analysis and Antitrust Implications - A Study in the Economics of Internal Organization*. New York: The Free Press.
- . 1985. *The Economic Institutions of Capitalism*. New York: The Free Press.
- . 1994. "Strategizing, Economizing, and Economic Organization." in *Fundamental Issues in Strategy; A Research Agenda*, edited by R. P. Rumelt, D. E. Schendel, and D. J. Teece. Boston, Mass.: Harvard Business School Press.
- . 2000. "The New Institutional Economics: Taking Stock, Looking Ahead." *Journal of Economic Literature* XXXXVIII:595-613.
- Williamson, Oliver E., Sidney G. Winter, and R. H. Coase. 1991. "The Nature of the firm : origins, evolution, and development." Pp. viii, 235 p. New York: Oxford University Press.
- Wu, Tim. 2010. "The master switch : the rise and fall of information empires." Pp. x, 366 p. New York: Alfred A. Knopf.
- Yoffie, David B. 1997. "Introduction: CHESS and Competing in the Age of Digital Convergence." in *Competing in the Age of Digital Convergence*, edited by D. B. Yoffie. Boston, Mass.: Harvard Business School Press.
- Zingales, L. 2000. "In Search of new Foundations." in *Working Paper no 515, The Centre of Research in Security Prices*, vol. 2000. University of Chicago.
- Zingales, Luigi. 1998. "Corporate Governance." *The New Palgrave Dictionary of Economics and the Law*:497-503.