

Foresight on Facilities Management in the Nordic Countries Proposal for a Common Research Agenda

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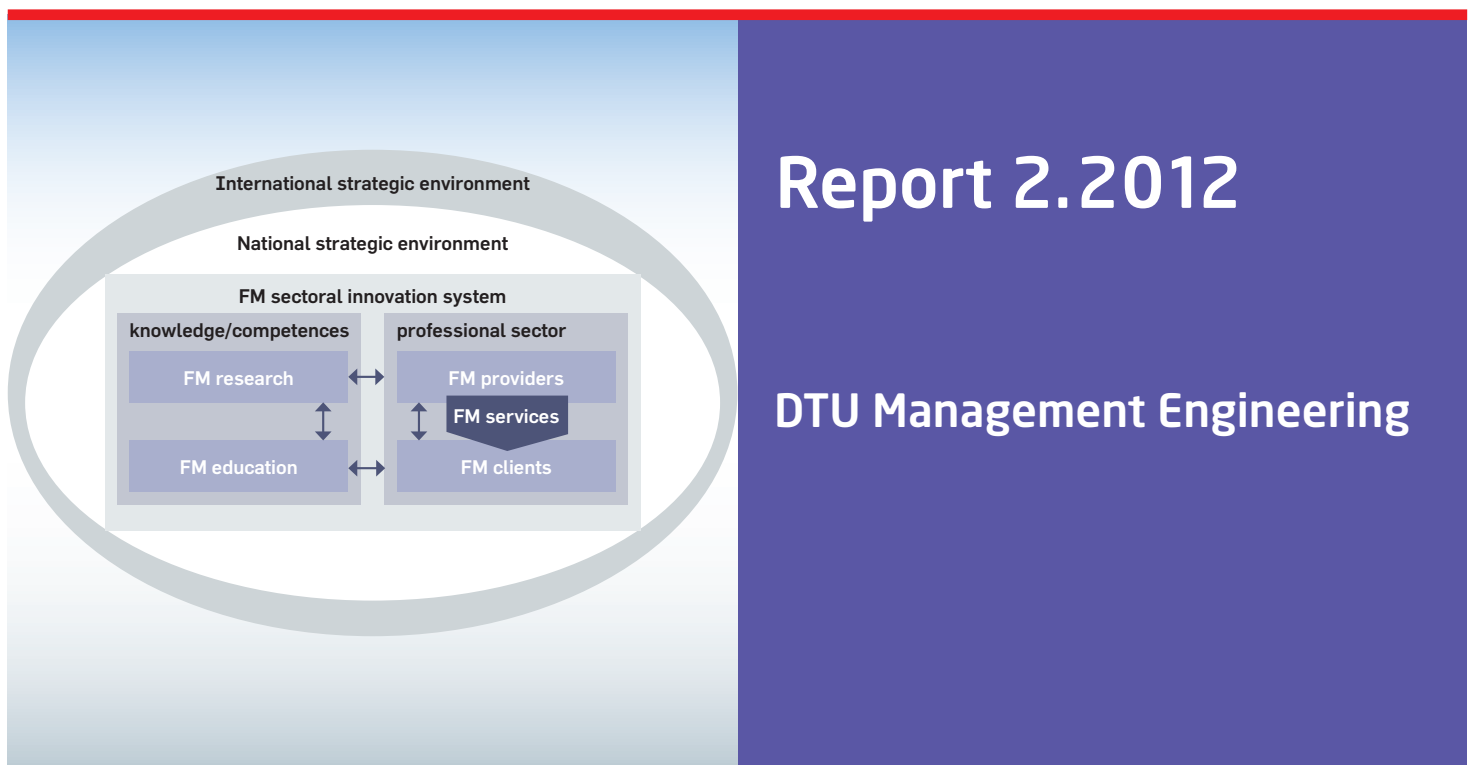
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Foresight on Facilities Management in the Nordic Countries

Proposal for a Common Research Agenda



Birgitte Rasmussen
Per Dannemand Andersen
Per Anker Jensen
February 2012

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Preface

This report includes the final results of CFM's Nordic FM Foresight project "FM Futures". The objective of this project was to identify foresights of the possible futures of FM in the Nordic countries in Europe and based on this to establish a proposal for a common research agenda, which can stimulate research in FM and increase the collaboration between universities in the different Nordic countries and between researchers and practitioners.

The project has included a workshop during autumn 2010 and spring 2011 in each of the four countries Denmark, Finland, Norway and Sweden with participants from the country where the workshop was held followed by a joint workshops with participants across the Nordic countries during CFM's Nordic conference in August 2011. After the conference a questionnaire survey was conducted among the participants in the workshops and the conference.

The round of workshops in the four countries was coordinated with a EuroFM project on FM Market Data and except for Finland a workshop on the FM Market Data project was arranged immediately before the foresight workshop. The workshops on the FM market focused on identifying the structure, size and trends for the national FM market in the country, where the workshop was held. This formed part of the basis for the following workshops with focus on identifying foresights by discussion of future trends, challenges and need for new knowledge and competences. The participants in the workshops were mostly FM practitioners representing major associations and prominent companies from both demand and supply side, including FM consultants, but also FM researchers and teachers participated in some of the workshops. The purpose of the questionnaire survey was to identify and make a prioritization of the most importance themes in a strategy for research and education.

Professor Per Anker Jensen, head of CFM, has been responsible for the project, which was carried out in collaboration with Professor Per Dannemand Andersen and Senior Researcher Birgitte Rasmussen from the section on Innovation Systems and Foresight. Both CFM and this section is part of DTU Management Engineering.

The workshops and the conference were arranged by CFM in collaboration with NordicFM and its member associations in the four countries. We would like to thank all the participants in the workshops and the survey.

Per Dannemand Andersen

Birgitte Rasmussen

Per Anker Jensen

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- Delphi survey – results
- Minutes from the four Nordic workshops

1. Introduction

The overall target of this foresight study was to contribute to the preparation of a Nordic FM strategy on research and education. We chose the foresight approach to ensure that the strategy reflects future needs and expectations among Nordic researchers and practitioners within the FM field.

Foresight is an approach to support in illuminating and assessing possible futures. There are a plethora of tools and methods grouped under the label of foresight methods, from the more positivistic forecasting to the creativity-inspiring visioning. We have chosen to use the following methods, see also **Figure 1**:

- Literature review (desk study)
- Workshops (professionals panels)
- Delphi questionnaire

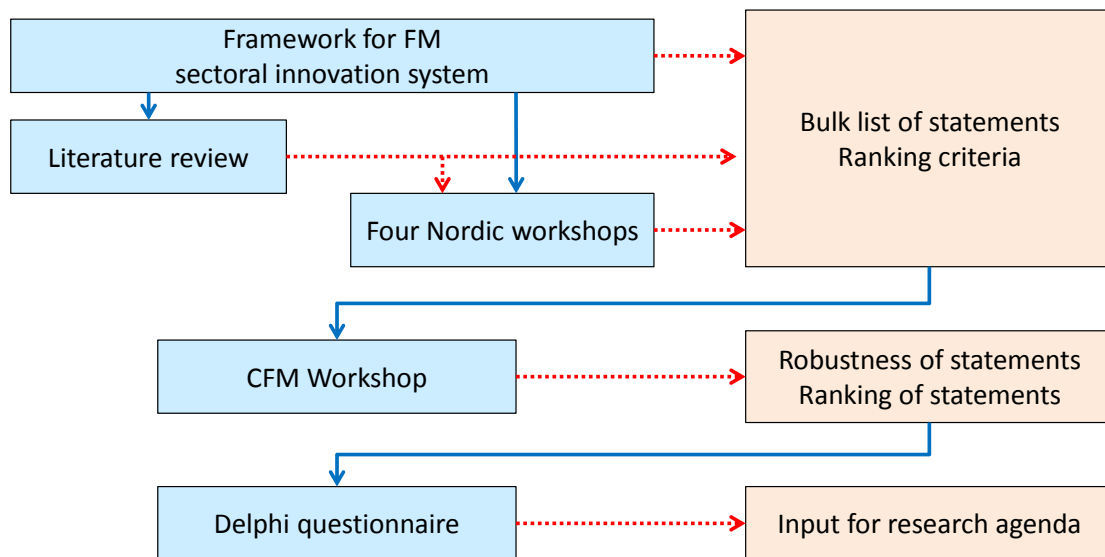


Figure 1: Overall structure of the foresight on facilities management

The project has included discussions and reflections of research themes and competences for the future of the FM profession by use of structured discussion on three overall themes that has been discussed and reflected in each part of the project: i) sector and market, ii) future trends and challenges, and iii) research and education.

1.1 Facilities Management – definition and generations

A European standard from 2006 has the following definition of FM: “*The integration of processes within an organisation to maintain and develop the services which support and improve the effectiveness of its primary activities*” (DS/EN 15221-1, 2008). The scope of FM can according to the standard be grouped around client demands summarised under two main headings: Space & Infrastructure (S&I) and People & Organisation (P&O).

Researchers from the UK (Pathirage et al., 2008) have presented a general development of FM with four generations, see **Table 1**.

Table 1: *Four generations of Facilities Management* (Pathirage et al., 2008, Alexander, 2009)

1970s	1G	Within the first generation of FM, it was merely considered as an overhead to be managed for minimum cost rather than optimum value. FM was characterised as working in isolation to the rest of the organisation and was criticised for the lack of applicability of the output of the FM function to the achievement of organisational effectiveness.	Operational
1980s	2G	The integration of a FM process perspective was characterised during the second generation of FM. Within this, FM promoted the process focus between the organisation's individual businesses and the FM organisation by making FM activities within the organisation a continuous process.	Tactical
1990s	3G	In the third generation, FM is seen as more concerned with resource management, concentrating on managing supply chain issues associated with the FM functions. This changing focus in FM as an integrated resource management process, stressed the importance of understanding FM as a business context.	Strategic
2000s	4G	In order to achieve the much needed alignment between organisational structure, work processes and the enabling physical environment, the organisation's strategic intent must clearly reflect the facilities dimensions in its strategic business plans, which represents the fourth generation.	Transformational

The research project "European FM Futures" reviewed the short history of FM and the project calls for the next generation of FM to take a leading role in transforming organisations and contributing, in a sustainable way, to the European knowledge economy (Alexander, 2009). An interesting and key question is: What will the fifth generation be like?

2. Analytical Framework – Foresight and Sectoral Innovation Systems

2.1 Foresight

Methodologically this project takes its origin in the tradition of foresight. We distinguish between the overlapping tradition of foresight and that of futures studies. We consider foresight as rooted partly in an American technology forecasting tradition grounded in strategic planning and operation research from the 1940s and 1950s and partly in a European tradition considering futures studies an art involving creative and imaginative thinking and acting (Krawczyk & Slaughter 2010). Increased globalisation, the increased importance of innovation for the national economies and for societal needs, and the new mode of knowledge production during 1980's together set the stage for governments increased interest in priority setting in science and technology and in linking such priorities to technological innovation (Martin & Johnston, 1999). In a couple books Martin and Irvine (1984, 1989) suggested to use foresight as a public policy tool in priority setting in science and technology. Foresight was originally just as a short 'label' for *'the techniques, mechanisms and procedures for attempting to identify areas of basic research beginning to exhibit strategic potential'* (Martin, 2010). From this foresight has developed also as a tool for other policy ends including creating common visions and building new networks and linkages around these visions, extending the breadth of knowledge and visions in relation to the future, bringing new actors in a strategic de-bate, and improving policy making and strategy formation in areas where science and innovation play a significant role (Georghiou and Keenan, 2006). Today, foresight is widely used in policy developing and policy making all over the world, both on national level and (maybe in particular) on regional level. Especially, in Europe but also in Latin-America and in the APEC area this practice of foresight is well documented in numerous studies (Keenan and Popper, 2008; Georghiou et al. 2009).

Today, foresight is based on the 'the new science' (Gibbons et al., 1994; Leydesdorff and Etzkowitz, 1998; Nowotny et al., 2001), on network perspectives (Callon and Law, 1997), and on learning perspectives (Nonaka, 1995). Furthermore, the rationales for foresight have developed as a practice not only for priority-setting in science and technology policy, but also as a tool for wider innovation policy ends, including creating common visions and building new networks and linkages around these visions, extending the breadth of knowledge and visions in relation to the future, bringing new actors into a strategic debate, and improving policy making and strategy formation in areas where science and innovation play a significant role (Georghiou and Keenan, 2006). The European Commission (2002) has defined foresight in this more recent practice of foresight as *".. the application of systematic, participatory, future-intelligence gathering and medium-to-long-term vision-building processes to informing present-day decisions and mobilising joint actions. Foresight brings together key agents of change and various sources of knowledge in order to develop strategic visions and anticipatory intelligence"* (European Commission, 2002).

The contribution of foresight is a structured process that empowers the actors (firms, organizations or public authorities) to design and enact their future rather than become the passive victims of an imposed future. Foresight as a strategic tool does not aim to predict the future or to unveil it as if it were prefabricated – but rather to support organizations and individuals to be strategic and proactive about the future pathways of products and processes. Foresight works systematically with a long-term perspective and tries to position the different expected developments on a time scale; in practice, the time perspective is often ten, twenty or thirty years, in some cases more. It is generally acknowledged that the theoretical rationale for foresight exercises is supported by the perspective

(or school) of evolutionary economics, which comprises the innovations systems approach (Georghiou and Keenan, 2006). Increased globalization, the increased importance of innovation for national economies and meeting societal needs, and the new mode of knowledge production during 1980s have set the stage for governments' increased interest in priority-setting in science and in linking such priorities to technological innovation. As the thinking on systems of innovations has been further developed in relation to national innovations systems (NIS), regional innovation systems (RIS), and sector specific innovation systems (SIS), foresight has emerged as a tool for wiring up these innovation systems (Martin and Johnston, 1999).

2.2 The FM innovation system

Several frameworks of the FM innovation system have been developed in order to assist or guide different analytical needs. For our purpose with focus on FM foresight, a simple (sectoral innovation system) framework of the FM sector and its strategic environment is regarded to be a useful tool to guide the analyses and processes, see **Figure 1**.

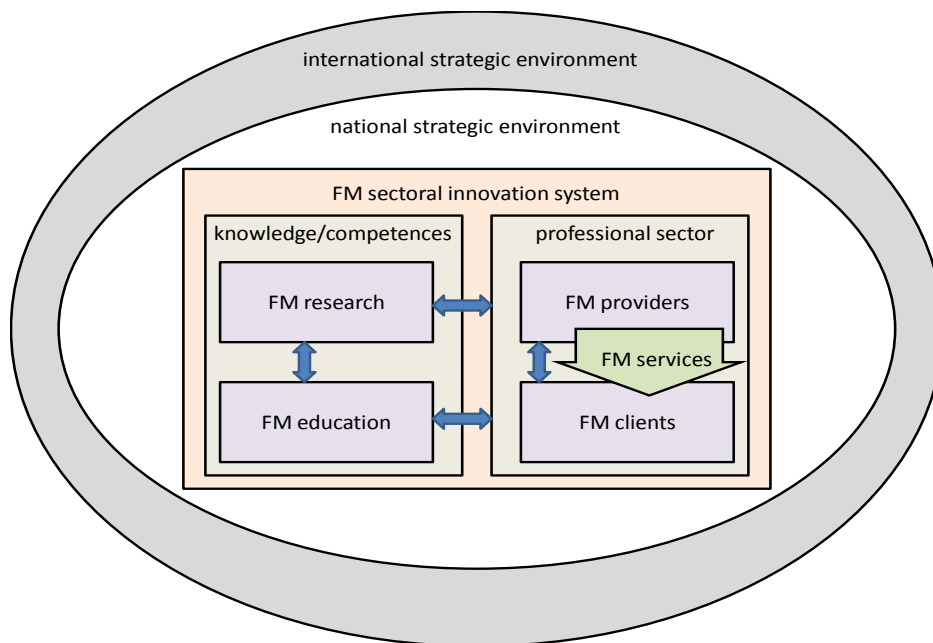


Figure 2. Framework for FM sectoral innovation system

Generally speaking, the innovation systems approach is a framework embracing a set of powerful concepts such as: relationship, boundary, input, output, environment, feedback, communication, control, and identity. An innovation system can be defined as the ‘*elements and relationships which interact in the production, diffusion and use of new and economically useful knowledge*’ (Lundvall, 1992). A sectoral innovation system approach comprises three dimensions: a) knowledge and technological domain, b) actors and networks, and c) institutions (Malerba, 2005).

The FM sector in this understanding consists of a number of providers that provides FM services to their customers or clients. Public FM research and FM educations and courses provide new (research based) knowledge and professionals (graduates) to the sector. The sector and the affiliated research and education institutions exist within a national (e.g. Danish) and international strategic environment.

3. Definitions and Mapping

One way of embarking on a foresight exercise is to classify the system under examination. In a foresight study, one ideally wants a classification of the domain that is at the same time operational, comprehensive and consistent. This implies a classification of the domain that delivers an overview of the object under analysis and identifies boundaries. This initial step of the foresight process is essential, because it has a significant impact on the structure of the subsequent steps of the process.

The foresight on facilities management is structured by three overall dimensions reflecting significant conditions and matters for development within the FM sectoral innovation system as shown in **Figure 3**.

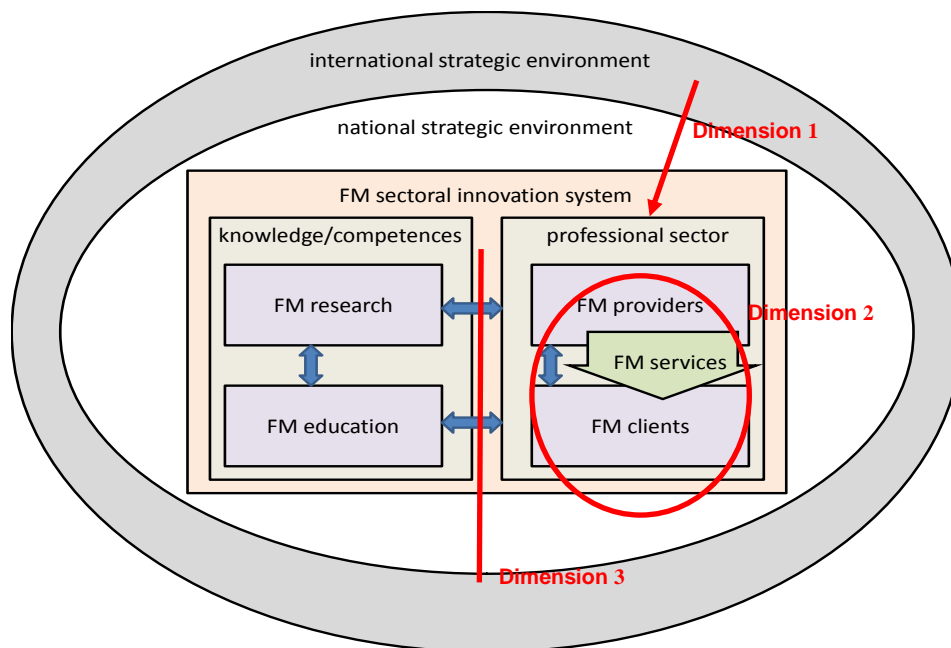


Figure 3: Framework for FM sectoral innovation system – dimensions in the technology foresight exercise

The three dimensions provide in three different ways an indication and understanding of the flow and availability of knowledge and know-how.

- Dimension 1: *Megatrends in the strategic environment affecting the FM sectoral innovation system*
 - This dimension deal with megatrends in the strategic environment of the FM sector that are going to affect the FM sector within the next two decades.
 - These megatrends can be characterised as external frame conditions and are mostly outside the influence of the actors within the FM sector.
 - We distinguish between the national (i.e. Danish) strategic environment and the international strategic environment. In practice this distinguishing often is difficult.

- Dimension 2: Current trends and challenges for the FM sector in Denmark/Norway/Sweden/Finland
 - This dimension deals with trends within the FM sector in Denmark/Norway/Sweden/Finland.
 - A trend is in this context defined as an inclination or a tendency that has been observed during the recent few years and that is expected to prevail during the next few (3-5) years.
 - These trends are mostly susceptible to influence by the actors within the FM sector – or results of a strategic or managerial decision taken by FM actors under consideration of developments in the external environment.
- Dimension 3: Future need for new competences and new knowledge for the FM professionals
 - This dimension deals with the need for generation of new knowledge and competence building within the FM sector.
 - The job profile and key qualification of FM professionals is of a generalist nature and cross-functional oriented. The profession uses knowledge and tools from a number of other professions and disciplines.
 - The key question for this project is: ‘What should be the curriculum for a formal education in FM? We here understand curriculum as the set of courses, and their content, that should be offered to students of FM at a university level.

4. Desk Study – Other FM Futures Studies

4.1 Introduction

As a first phase of the project a desk study was carried out scanning the vast literature of the future for FM and the very vast literature on the strategic environment around the FM sector. The latter comprise mostly literature without any specific reference to the FM sector. Approximately 50 references have been scanned through to find the most relevant material. The resulting references comprise two groups: 1) traditional academic literature of books and articles in peer reviewed journals and 2) reports developed by interest groupings, firms or public authorities. In the latter group we have added a few studies examining general trends such as the future of HR management (PriceWaterhouseCoopers, 2007) and environmental issues (EEA, 2004), see **Table 2** for an overview.

Over the last 12 years there has been a strong interest and discussion about the future of FM. It started around the change of millennium. At the EuroFM/IFMA conference in Glasgow year 2000 the topic was hot with several presentations and a panel debate. The year before an international conference was arranged specifically around this topic at the University College London resulting in an influential book edited by Nutt and McLennan (2000) organized in relation to Bev Nutt's suggestion of four possible trails for the future of FM related to the four most important types of resources:

- Financial resources - business
- Human resources – people
- Physical resources – property
- Knowledge resources – information

The conference at the University College London in 1999 was so successful that it was followed up by another conference in 2004, which among other things resulted in a special volume of the journal *Facilities* on “New Alignments in FM” with articles based on presentations from the conference and an editorial article by Bev Nutt (2004).

IFMA started publishing FM Forecast reports in year 2000 and continued with annual reports in 2001 and 2002. After that a report was published in 2005, when IFMA had 25 years anniversary (IFMA, 2005), again in 2007 (IFMA, 2007) and the last publication is from 2011 called “Exploring the Current Trends and Future Outlook for Facility Management” (IFMA, 2011). The main results from these three most recent reports are summarized in section 4.2.

EuroFM's Research Network Group started its FM Futures project in 2005 and it has included three facilitated workshops in different European countries. The project was managed by professor Keith Alexander, Centre for Facilities Management, Manchester, UK. The overall results are included in the research report “Facilities Management Futures” (Alexander, 2008) and the summary report “European Facilities Management – The next generation” (Alexander, 2009). The time frame for the summary report is 2018. The main results of the three workshops are summarized in section 4.3.

Table 2. Overview of FM foresight studies

Source, year	Geographical focus	Sectorial focus	Time Horizon	Source type	Method or approach	Sponsor of study
Wiggins, 2010	n.a.	Facility management	n.a.	Book	Trends	n.a.
Saurin et al., 2008	n.a.	Workspace	20 – 30 years	Peer reviewed article	Scenarios	Johnson Controls & Dublin Institute of Technology
Roberts, 2004	n.a.	Urban facility management	n.a.	Peer reviewed article	Academic review	n.a.
Nutt, 2004	n.a.	Infrastructure resources	n.a.	Peer reviewed article	Critical review	n.a.
Grimshaw, 2003	n.a.	Facility Management	n.a.	Peer reviewed article	Academic review	n.a.
ISS, 2011	Global	Facility Management	2020	Report	Scenarios based on survey among 50 industry experts	ISS
Balmer & Clarke, 2010	n.a.	Facility Management	n.a.	Blog	Review of reports, blogs and websites	n.a.
National Platform for the Build Environment, 2008	UK	Research agenda for the build environment	2020	Report	Literature review, interviews, workshops	Arup, Atkins, Balfour Beatty, MACE, Taylor Woodrow, Department for Business
Chartered Management Institute, 2008	Global	World of work	2018	Report	PEST scan, workshops, expert panels, regional panels, leadership panel, scenarios	Chartered Management Institute
PriceWaterhouse-Coopers, 2007 (PWC),	Global	People management	2020	Report	Scenarios based on survey among 2,739 graduates from US, China and UK	PWC
IFMA, 2007	Mostly USA	Facility Management	5 years	Report	Trend analysis based on expert panel (8 experts)	IFMA
World Economic Forum, 2007	Global	Engineering & Construction	2020	Report	Scenarios based on multistakeholder workshops	WEF's Engineering & Construction Community and Centre for Strategic Insight
EEA, 2004	EU	European environment	2100	Report	STEEP Megatrends	EEA

It was originally planned that the EuroFM project should have been facilitated by The Futures Academy, Dublin Institute of Technology, Ireland, but they were only involved in one of the workshops. Besides they worked together with Johnson Controls on a large futures project on tomorrow's workplace with a time frame of 2030. The project has resulted in two reports (Saurin and Ratcliffe, 2007, Ratcliffe and Saurin, 2008) and an article in Journal of Corporate Real Estate (Saurin, Ratcliffe and Puybaraud, 2008). The main results of the project are summarized in section 4.4.

ISS has in October 2011 published a White Book called "ISS 2020 Vision – Scenarios for the future of the Global Facility Management Industry" produced by the Copenhagen Institute for Futures Studies based on workshops, questionnaires and interviews. The results are presented in section 4.5

4.2 IFMA's studies

IFMA's FM Forecasts are based on invited experts mostly from the USA, who each prepare inputs from their sector and area of expertise, which are discussed at a facilitated workshop resulting in the identification of major trends and possible strategic implications. Neither the experts nor the facilitators were the same in the forecasts from different years. The time frame has typically been the next 5 years.

In the study from 2005 the experts were asked to consider an "upside scenario" called "Temporary Setback on the Road to Paradise" and a "downside scenario" called "The New and Forever Urgent Future". The study presented a number of broadly described trends and issues under the headings:

- Real Estate Trends (public, private, PPP and land use)
- Security and Terrorism (including likely targets through 2010)
- Intelligent Buildings and Building Automation Systems Trends
- Environmental Trends
- Organizational and Workplace Trends (including outsourcing and workforce)

Strategic focus consisting of levels of added value were seen as one of the major areas of importance for FM in the upside scenario. However, sustainability as a general concept received virtually no attention in the upside scenario, while energy was being the most important aspect of sustainability in the downside scenario. Many experts on the other hand saw increasing stakeholder value as being important in the downside scenario, while virtually nobody saw it as important in the upside scenario.

The study from 2007 did not deal with different scenarios but was more specific in the description of trends, and the following 8 trends were identified and presented in order of importance (IFMA, 2007):

1. Linking facility management to strategy.
2. Emergency preparedness.
3. Change management.
4. Sustainability.
5. Emerging technology.
6. Globalization.

7. Broadening diversity in the workforce.
8. Aging buildings.

These trends are in the executive summary preceded by the following general statements:

“The increasing pace of business and the continued materialization of the global marketplace ensure that the overall size of the playing field that facility management professionals oversee is growing. Most of the key topics have been identified in previous forecasts but continue to be relevant and significant. These include: rapid pace of change, changing technology, building automation, security issues and sustainability. Other issues have been discussed before but the emphasis may have changed, such as the importance of linking facilities with business strategies, developing approaches to deal with aging building stock and the importance of advance planning for disaster preparation and recovery. While these are not new ideas, they have a greater prominence in the world that facility management professionals face.”

The objectives of this study (IFMA, 2011) were similar to those mentioned above for the former study from 2007. The workshop of the study was conducted in 2010. The executive summary included the following statements:

“Globally, the profession of facility management continues to mature and evolve in many facets. Facility managers today are expected to understand their company’s core business and contribute to the bottom line—not only by reducing facility costs, but also by improving the productivity, revenue generating capacity and image of the entire organization. Evolving trends indicate that FM professionals have greater opportunity to add value to their organizations through efficient management, improved technology, and strategic planning.”

The study identified 10 trends divided in 4 externally-driven, 3 internally-driven and 3 organizationally driven trends as listed below.

Externally-driven trends are dictated by societal and other factors.

1. **Sustainability** continues to grow in importance and prominence worldwide. Organizations have begun to incorporate it into business goals and culture, and within the profession, it has moved from an emphasis primarily for new construction to influencing existing building operations.
2. **Complex building systems** and controls increasingly offer opportunities and challenges for the profession. The industry can leverage new technologies to better manage facilities, but it also needs to ensure adequate training is in place to educate practitioners on new systems.
3. Facility management faces problems stemming from the **aging building stock** professionals manage — difficulties compounded by the global recession. As facilities and mechanical systems reach and exceed their expected operating lives, significant issues of "repair or replace" must be addressed.
4. Facility managers play a critical role in business continuity after a disrupting event, not only by crafting and implementing the prepared response plan, but also by serving as role models for the organization in **emergency preparedness and business continuity** planning.

Internally-driven trends derive from within the profession.

5. The increasing **quantity and complexity of data** available to facility managers through new reporting protocols poses challenges and opportunities for the profession. More facility departments have added the ability to convert raw data into usable and meaningful information that fosters informed decision making.
6. **Finding top talent** in facility management is gaining greater importance. Recognizing that facility management is often not the first choice of today's new graduates, the profession will need to increase its branding and outreach.
7. There is a growing desire to **elevate facility management** to improve the recognition and perceived value of the profession within the corporate hierarchy. Many have achieved success in this arena through careful alignment with their organization's mission and by emphasizing facility professionals' role as managers of significant assets and enablers of the organization's mission, vision and values.

Organizationally-driven trends derive from the corporations and organizations housing facility departments.

8. Increasingly, organizations are expanding their expectations of facility management to include both technical and business acumen, which drives **the need for an evolving skill set** for those in the profession. While the technical aspects are generally well understood, the increased focus on business acumen will require facility professionals to think and act strategically and to communicate their positions in the language of the C-suite.
9. There is a growing recognition that facility management contributes to the health and well being of building occupants, thereby benefiting **efficiency, productivity and profitability** — key pillars of an organization's bottom line.
10. **Changing work styles** significantly affect both occupant behavior and the vacancy rate of buildings, which affects how buildings must operate. Facility management increasingly faces challenges posed by open work plan arrangements, differing hours of operation, and varying occupancy rates and densities — all of which impact power use and other considerations.

4.3 EuroFM's futures workshop

The three workshops took place in Helsinki 2005, Manchester 2007, and Zürich 2008. The workshops had variations in focus and methodology applied. The project database includes documentations for each workshop and documents of other futures studies, articles and tools.

The Helsinki workshop took place 16th-17th October 2005 and was arranged by FIFMA and Helsinki University of Technology. The two-day workshop included a seminar and a Future Wheel exercise facilitated by Finland Futures Research Centre, Turku School of Economics. The Future Wheel methodology was invented by Jerome C. Glenn and resembles Mind Mapping with a chosen phenomenon put as a central focus point.

The participants in the workshop chose to focus on “full service facilities” in office buildings. Three parallel groups worked with historic forces, current impacts and future consequences, respectively. The main results are shown in **Figure 4, 5 and 6** (Rasila et al., 2006).

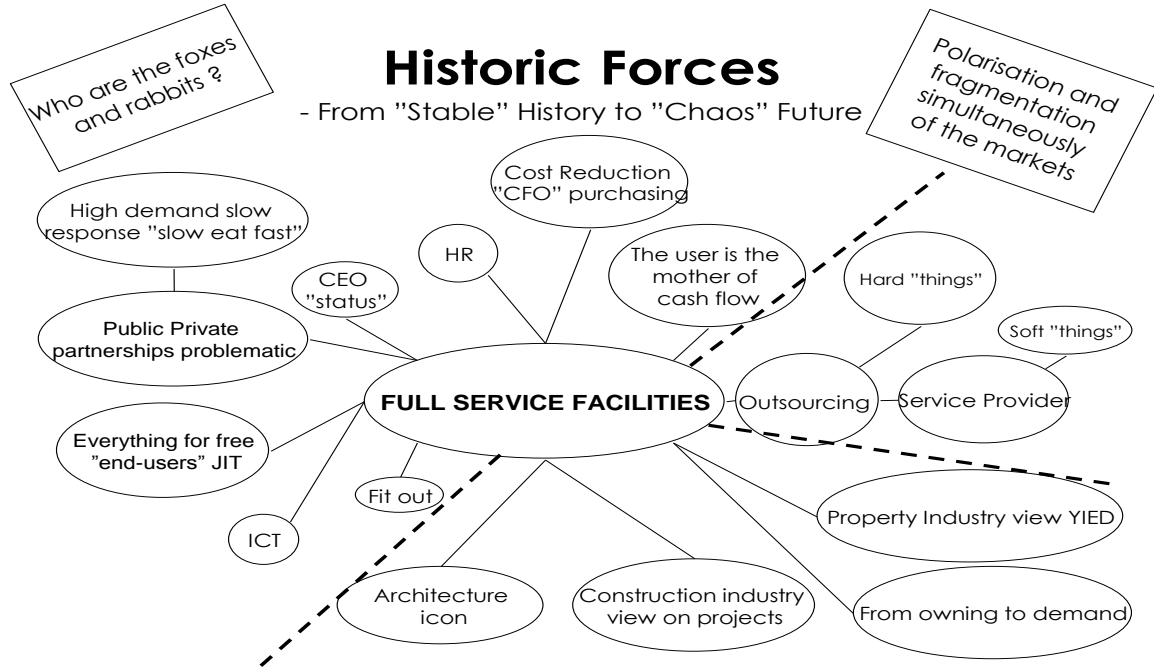


Figure 4: Result on historic forces from the Helsinki workshop

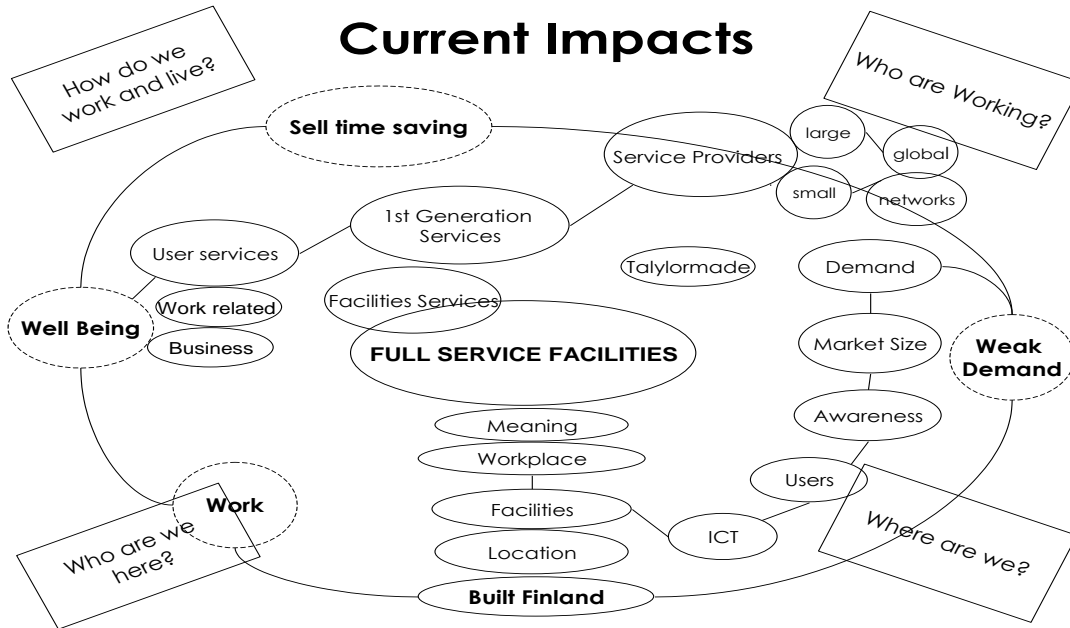


Figure 5: Result on current impact from the Helsinki workshop

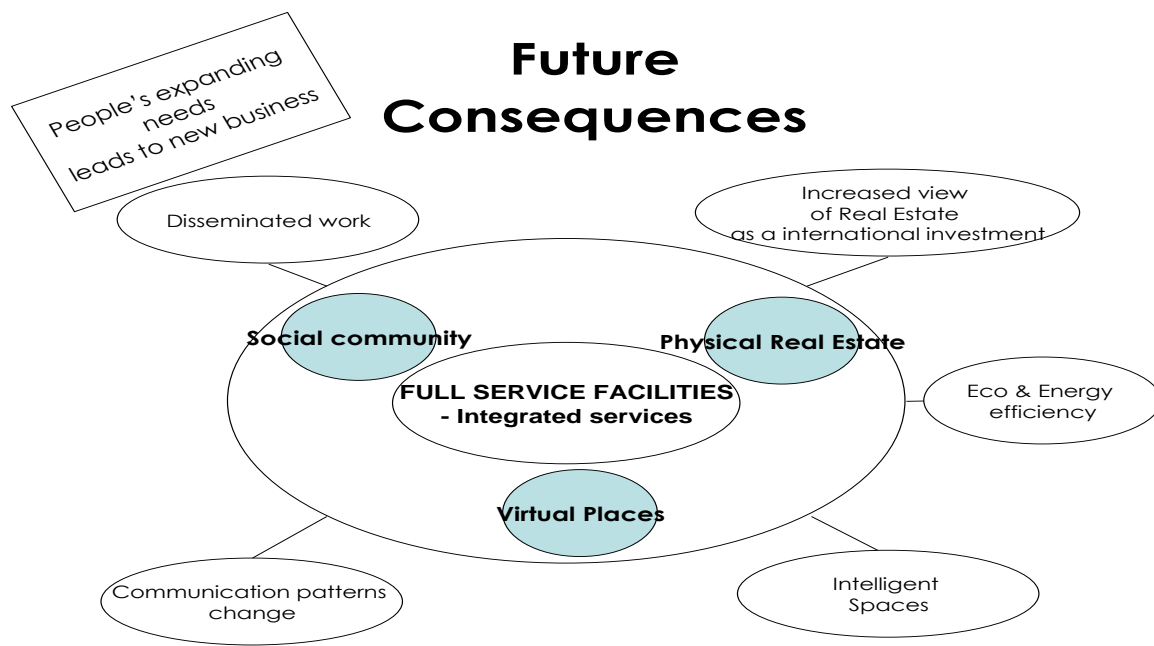


Figure 6: Result on future consequences from the Helsinki workshop

The Manchester workshop took place on the 9th March 2007 as part of a week-long international FM ‘research hotel’ hosted by the Centre for Facilities Management and Salford University. It was facilitated by The Futures Academy, Dublin Institute of Technology, and applied their Prospective Through Scenarios methodology, see section 4.4 and **Figure 10**.

The focus was on the potential nature and role of ‘City FM’ as both a concept and a practice. The strategic question was defined as:

“What actions should the FM discipline, industry and the professions associated with it, take now to secure a preferred future for successful competitive city management?”

The driving forces of change were categorised by a technique called the ‘six sector approach’. The participants were divided up into four groups, with each group examining the different sectors as follows: Economy, Society/demography, Governance, Environment, and Technology. Each group was asked to investigate the driving forces at the three spatial levels: Meta (global, European), Macro (national, regional) and Micro (local).

Work done prior to the workshop, established the scenario logics by identifying two critical uncertainties that would provide a basis to create coherent, objective scenarios. Based on combinations the dichotomies collective versus individual and pragmatic versus creative four different scenarios were identified as shown in **Figure 7**.

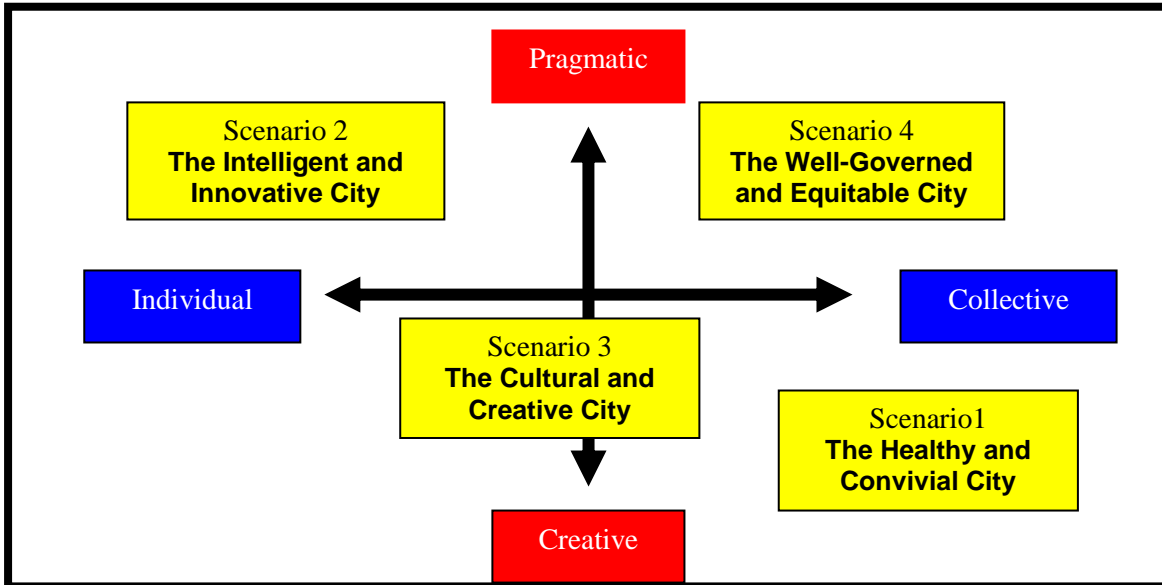


Figure 7: Scenarios from the Manchester workshop

At the workshop these scenarios were further investigated in a time frame of 2025 and a number of policy themes and action agendas for FM were defined as shown in **Figure 8**. Finally, a preferred future was outlined.

The Zürich workshop took place on 11th November 2008 hosted by Institute of Facility Management, Zurich University of Applied Sciences. It was facilitated by Keith Alexander and applied the Prospective Through Scenario methodology similar to the Manchester workshop. The strategic question was agreed as:

”What are the major forces of change affecting the future of facilities management and the workplace, and how should the facilities management community prepare itself to face a future of uncertainty and complexity?”

To enable clustering and confirmation of issues and trends an analytical framework called PESTLE was applied. This is an acronym for Political, Economic, Sociological, Technological, Legal, and Environmental. The result of this analysis was used in CFM’s study in an adapted form with the headlines Social, Technology, Economy and Political (STEP), see section 5.1.

Scenarios were developed around two critical uncertainties identified in the initial brainstorming session: Sustainability and Ways of working. Three groups worked in parallel. An example from one of the groups is shown in **Figure 9**.

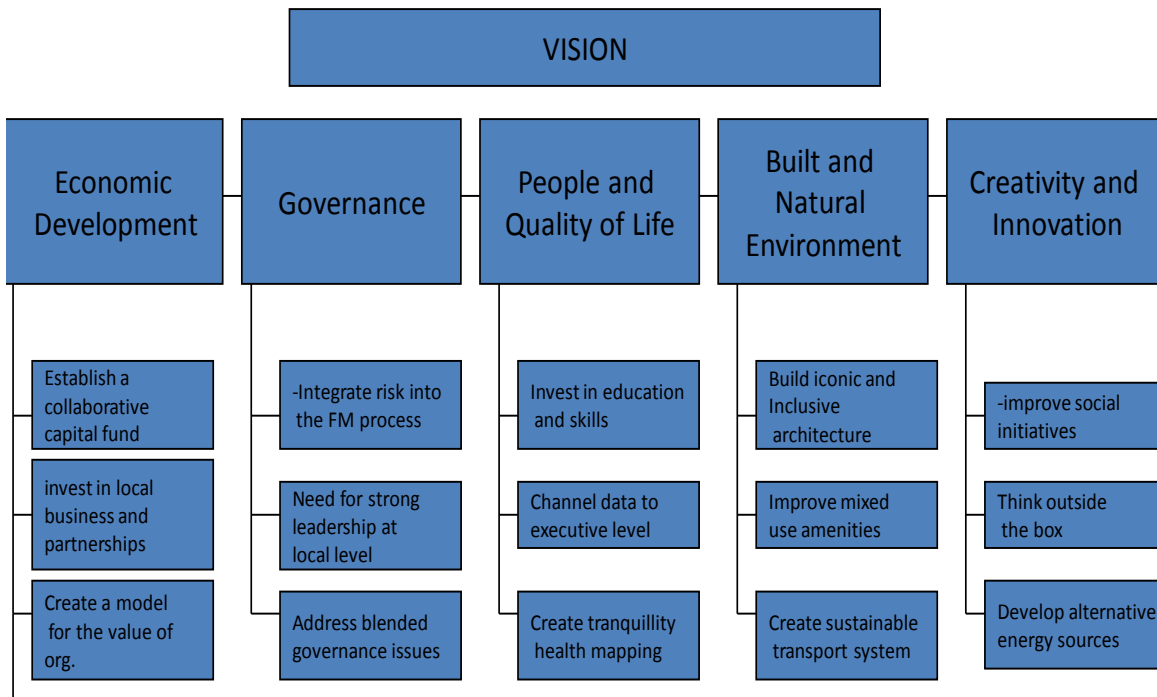


Figure 8: Policy fields and action agenda from the Manchester workshop

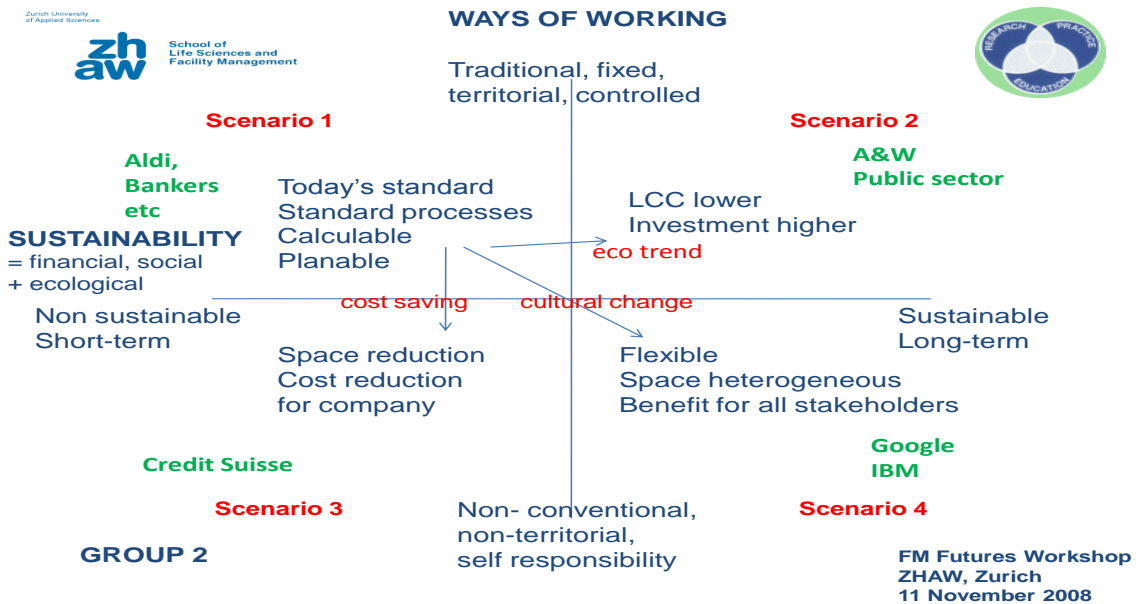


Figure 9: Scenarios from group 2 in the Zürich workshop

4.4 Scenarios for tomorrow's workplace

The Prospective Through Scenarios methodology developed at The Futures Academy, Dublin Institute of Technology, is illustrated in **Figure 10**.

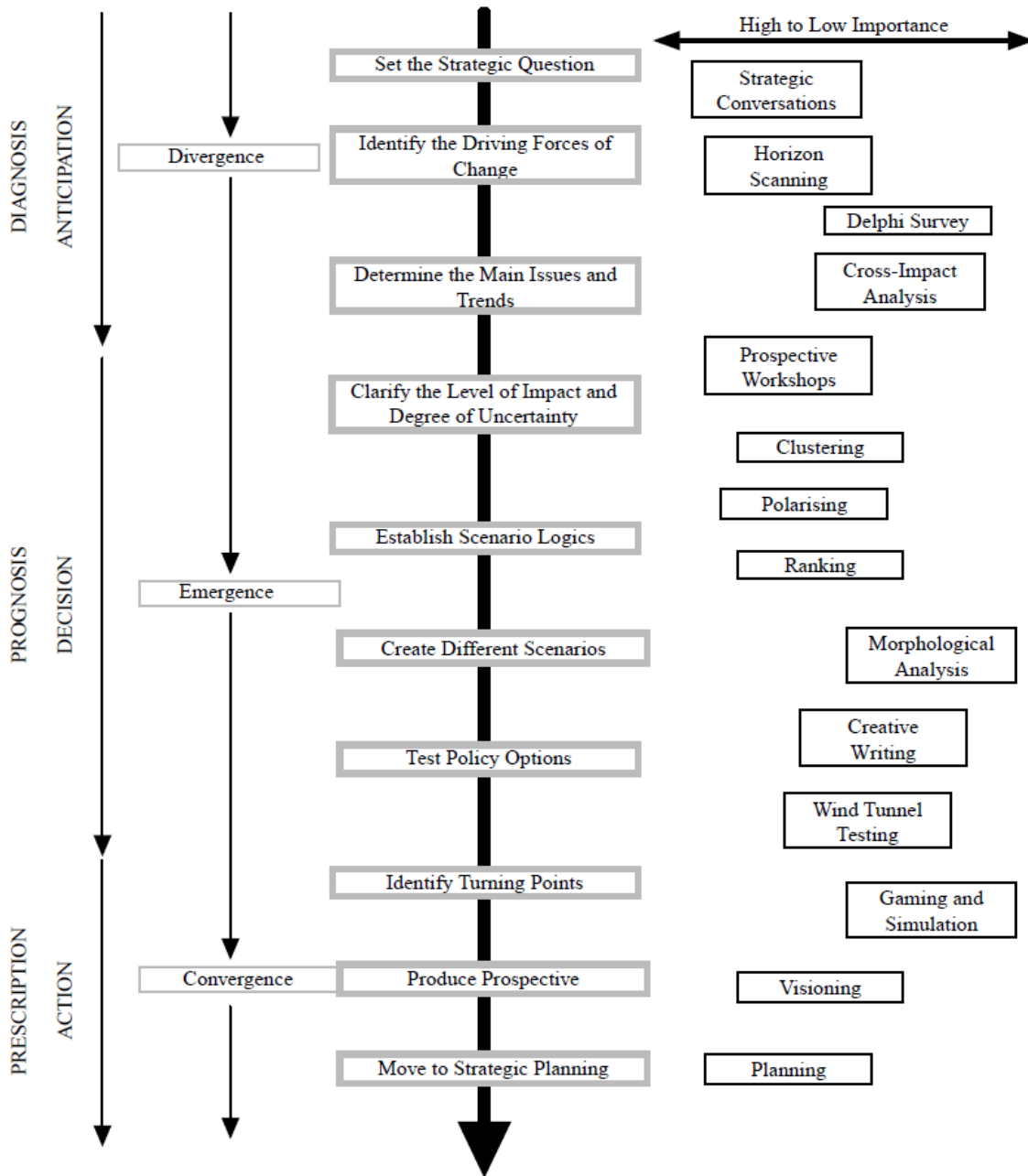


Figure 10: The Prospective Through Scenarios methodology (Saurin, Ratcliffe and Puybaraud, 2008)

It starts with setting the strategic question. In the future studies with Johnson Controls this was first defined as:

“How can the facilities management community prepare for the future of the workplace considering the following driving forces?”

- *knowledge capital;*
- *workplace culture;*
- *technology and the environment;*
- *quality of life; and*
- *large scale governance.”*

In the second phase of the studies the strategic question was set as:

“What might the future of the sustainable workplace be like in 2030?”

The scenario creation stage represents the crux of the overall “Prospective through scenarios” process. It involves developing three or four stories to illustrate a number of possible alternative pathways into the future. The first phase created three global workplace scenarios:

1. Jazz – A global Market Place by 2030: the workplace is a network
2. Wise Councils – A Secure World by 2030: the workplace is a community
3. Dantesque – A Fragmented World by 2030: the workplace is a fortress

The outcome of the second phase was three divergent strategies nested within the first set of scenarios, see **Figure 11**:

1. Hive (within Jazz)
2. Eco-office (within wise councils)
3. Gattaca (within Dantesque)

4.5 Scenarios of ISS 2020 Vision

The main objectives of the ISS 2020 Vision study was to develop a set of global scenarios for the future of the FM and services industry and to bring awareness about the future trends, uncertainties and opportunities that could have the greatest impact on ISS and its customers.

The study was carried out by the Copenhagen Institute for Futures Studies in collaboration with GlobalFM and IFMA Foundation during the winter and spring of 2010-2011 using the following methods:

- Workshops with ISS executive group.
- Surveys with responses from 308 ISS Top Managers around the world and from 50 external global facility management experts conducted in January 2011.
- In-depth interviews with six external industry spokesmen
- Evaluation of the results at a customer workshop in London in July 2011

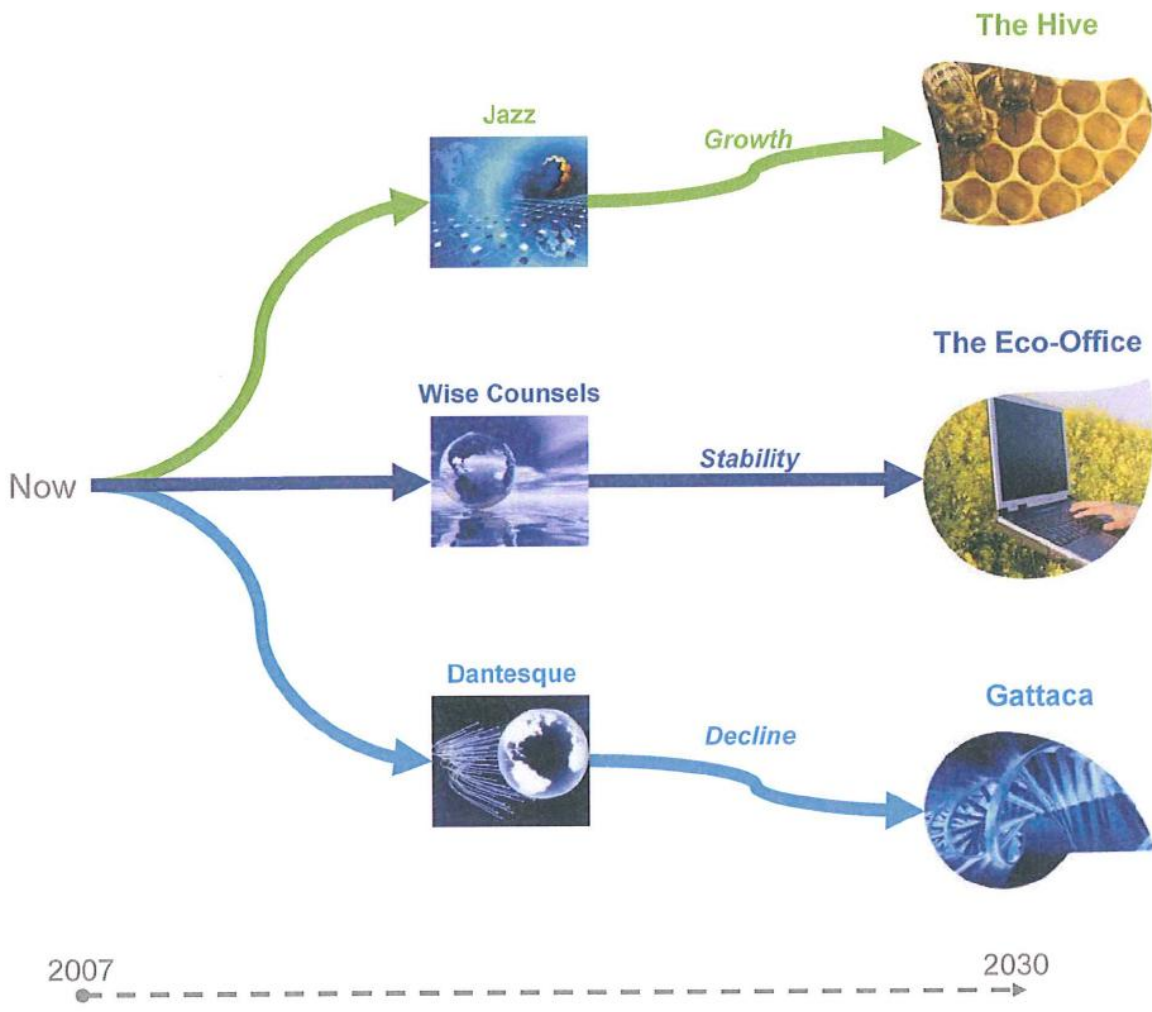


Figure 11: Scenario for tomorrow's workplace (Ratcliffe and Saurin, 2008)

The study identifies 10 megatrends divided in 3 groups of external trends and a group with 2 industry specific trends as listed below:

Factor Megatrends

1. Economic growth
2. Globalization
3. Aging and urbanization
4. Sustainability

Knowledge Megatrends

5. Technological development
6. The growth of a knowledge society

Social Megatrends

7. Individualization
8. Commercialization

Trends and Tendencies specific to the FM Industry

9. New ways of working
10. Preparedness and populations at risk in densely populated urban areas

Based on the megatrend analysis the study identifies “The technology dimension” and “The sustainability dimension” as the key uncertainties, which were regarded to have the highest impact on the global FM and services industry towards 2020. This resulted in establishing the 4 scenarios.

The technology dimension represents the vertical axis divided according to the degree of breakthrough in manpower substituting technology with high at the top and low at the bottom. The sustainability dimension represents the horizontal axis divided according to the degree of sustainability being prioritised with high on the right side and low on the left side.

The 4 scenarios are:

- ***Capitalism Reinvented***, where a high degree of technology breakthrough is realised, while sustainability is not prioritised
- ***The Great Transformation***, where a high degree of technology breakthrough is realised, while sustainability is also prioritised
- ***Sustainable Business***, where only a low degree of technology breakthrough is realised, while sustainability is prioritised
- ***Fragmented World***, where only a low degree of technology breakthrough is realised, while sustainability is not prioritised

At the customer workshop in July 2011 the participants – by and large – agreed that “Fragmented World” best represents the world in 2020. The participants all believed that sustainability would increase in importance towards 2020 but only grow moderately. The pace of technological development and its impacts on the global FM and services industry was seen as very uncertain. Most participants believed that breakthroughs will happen towards 2020, but they will not be as groundbreaking over the next ten years as many technology enthusiasts opine. The most likely scenario for the situation in 2020 is therefore seen either as being either the “The Great Transformation” or “Sustainable Business” as illustrated in **Figure 12**.

As the ISS Vision report was published after the conclusion of the present FM Foresight study, the ISS report did we not included in the initial desk study. But the results of the two studies are compared.

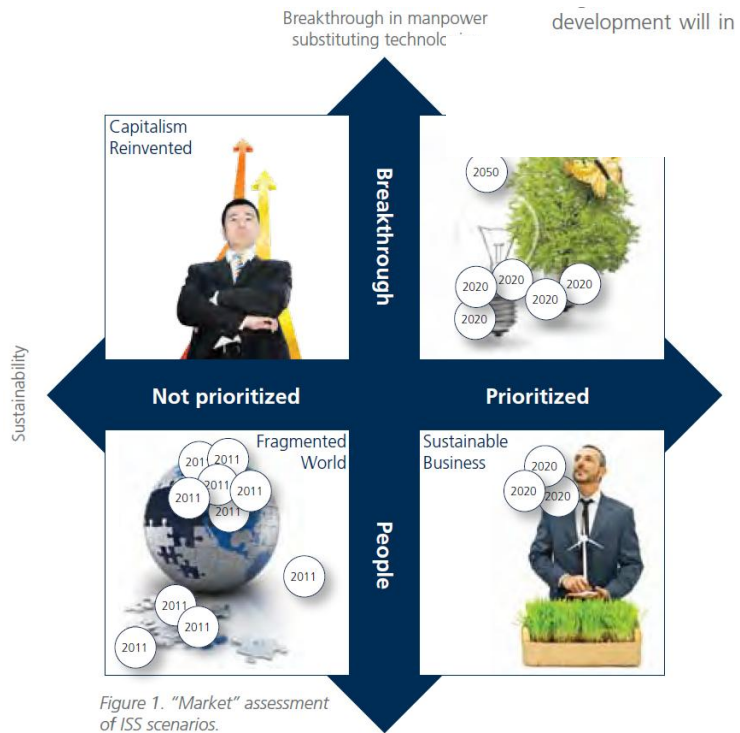


Figure 12: "Market" assessment of scenarios of ISS 2020 Vision (ISS, 2011)

5. Results from Four Nordic Professional Panels

Four Nordic professional panels have been arranged (minutes from the workshops enclosed in appendices):

- Denmark: 12 FM professionals participated in the workshop 27. October 2010 at the Technical University of Denmark.
- Norway: 8 FM professionals participated in the workshop 5. November 2010 at NHO Service in Oslo.
- Sweden: 13 FM professionals participated in the workshop 15. March 2011 at DN-Skrapan in Stockholm.
- Finland: 10 professionals participated in the workshop 18. May 2011 at SOL-city in Helsinki.

The professional panels were arranged by Per Anker Jensen in collaboration with NordicFM and national partners. The workshops were facilitated by Per Dannemand Andersen and Birgitte Rasmussen.

5.1 Megatrends in the strategic environment of FM

This part of the workshops was supported by a list of megatrends for the external environment of the FM sector based on results from 'FM Futures workshop in Zürich 2008'. The list was structured by use of the STEP approach grouping the megatrends in four categories: Social, Technology, Economy and Political.

This part of the workshop was structured by the following two leading questions:

- Question 1: *Which megatrends will impact the FM sector within a time horizon of 10-15 years?*
 - In small groups: Discuss and supplement the list of megatrends in the external environment.
 - Each participant: Indicate by use of five 'blue dots' the five megatrends of highest significance for the FM sector in Denmark/Norway/Sweden/Finland.
- Question 2: *Identify the most certain and uncertain megatrends among the selected significant megatrends.*
 - Each participant: Indicate by use of five 'green dots' the five most certain megatrends among the selected significant megatrends.
 - Each participant: Indicate by use of five 'red dots' the five most uncertain megatrends among the selected significant megatrends.



Workshop in Sweden (15 Mar 2011) – discussion of megatrends in external environment

DTU Management
Institut for Planlægning, Innovation og Lærelse

CFM

Megatrends in the external environment
Based on results from FM Futures workshop in Zürich 2008
27 Oktober 2010

STEP	Megatrend in the external environment	Betydning	Usikkerhed
Social	Demographic change – labour shortage	•••••	•••••
	Aging population	•••••	•••••
	Increased mobility	•••••	•••••
	Diversity in society	•••••	•••••
	Migration	•••••	•••••
	Mix of cultures	•••••	•••••
	Change of culture – multi-cultural society	•••••	•••••
Technological	Information and Communication Technology	•••••	•••••
	Knowledge management systems	•••••	•••••
	Intelligent building systems	•••••	•••••
	Faster technological change	•••••	•••••
	Security	•••••	•••••
	Stronger risk management methods	•••••	•••••
Economic (+ market issues)	IKT fylder mindre og mindre, uanset A/B-kategori	•••••	•••••
	Globalisation +	•••••	•••••
	Internationalisation – Europeanization	•••••	•••••
	Financial restrictions (budget restrictions)	•••••	•••••
	Increasing cost pressure	•••••	•••••
	Financial restrictions within the health sector	•••••	•••••
	Real estate valuation – opportunity for FM	•••••	•••••
	Competition a new phenomena in health	•••••	•••••
	Individualisation of needs	•••••	•••••
	Increasing energy prices	•••••	•••••
Political (+ legal)	More professional customers	•••••	•••••
	Udflytning af FM virksomhed, FM flytter væk	•••••	•••••
	Increased focus on sustainability	•••••	•••••
	Consequences of climate changes	•••••	•••••
Political (+ legal)	Stronger role of servicing department	•••••	•••••
	Policy mix Under forandring	•••••	•••••

Results from the workshop in Denmark (27 Oct 2010) showing the poster with megatrends and illustrating the use of blue, green and red dots in relation to the list of megatrends in the strategic environment

Rating of the Zürich workshop trends at the Nordic workshops

SOCIAL (from Zürich workshop) Megatrends in the strategic environment	Denmark			Norway			Sweden			Finland		
	S	C	U	S	C	U	S	C	U	S	C	U
Demographic change – labour shortage	5	6	2	6	7	-	-	-	-	1	1	3
Aging population	2	3	3	-	-	-	-	-	-	2	5	-
Increased mobility	-	-	-	-	-	-	-	-	-	2	-	7
Diversity in society	2	-	1	-	-	-	-	-	-	-	-	-
Migration	-	-	-	-	-	-	-	-	2	-	-	-
Mix of cultures	5	6	4	-	-	-	2	1	8	1	1	5
Change of culture – multi-cultural society	-	-	-	-	-	-	-	-	-	-	-	-

S: Significance (blue), **C:** Certainty (green), **U:** Uncertainty (red)

TECHNOLOGICAL (from Zürich workshop) Megatrends in the strategic environment	Denmark			Norway			Sweden			Finland		
	S	C	U	S	C	U	S	C	U	S	C	U
Information and Communication Technology (ICT)	2	1	-	5	4	-	9	5	-	-	-	-
Knowledge management systems	-	-	-	2	1	3	2	1	3	-	-	-
Intelligent building systems	3	4	-	-	-	-	-	-	-	-	-	-
Faster technological change	1	1	3	2	1	3	3	9	2	-	-	-
Security	1	-	1	-	-	-	-	-	-	1	4	2
Stronger risk management methods	-	-	-	-	-	-	1	1	8	-	-	-

S: Significance (blue), **C:** Certainty (green), **U:** Uncertainty (red)

ECONOMIC (from Zürich workshop) Megatrends in the strategic environment	Denmark			Norway			Sweden			Finland		
	S	C	U	S	C	U	S	C	U	S	C	U
Globalisation	6	6	-	-	-	-	6	8	-	-	-	-
Internationalisation – Europeanization	3	4	1	2	1	5	2	1	7	-	-	-
Financial restrictions (budget restrictions)	-	-	-	-	1	4	-	-	-	-	-	-
Increasing cost pressure	2	1	3	5	5	-	-	-	-	-	-	-
Financial restrictions within the health sector	-	-	-	-	-	-	-	-	-	-	-	-
Real estate valuation – opportunity for FM	1	-	1	-	-	-	-	-	-	-	-	-
Competition as a new phenomena in the health sector	-	-	-	2	1	5	-	-	-	-	-	-
Individualisation of needs	-	-	-	-	-	-	-	-	-	2	-	5
Increasing energy prices	-	2	1	-	-	-	1	1	6	-	-	-
More professional customers	3	3	6	1	4	2	-	-	-	-	-	-

S: Significance (blue), **C:** Certainty (green), **U:** Uncertainty (red)

POLITICAL (from Zürich workshop) Megatrends in the strategic environment	Denmark			Norway			Sweden			Finland		
	S	C	U	S	C	U	S	C	U	S	C	U
Increased focus on sustainability	7	9	-	5	4	2	2	2	5	9	7	-
Consequences of climate changes	1	-	2	-	-	-	4	4	-	-	-	-
Stronger role of servicing department	2	-	5	-	-	-	-	-	-	-	-	-

S: Significance (blue), **C:** Certainty (green), **U:** Uncertainty (red)

Additional trends and rating suggested at the Nordic workshops

SOCIAL (suggested at the Nordic workshops) Megatrends in the strategic environment		signifi- cance	cer- tain	uncer- tain
DK	Societal polarization – A-team and B-team	1	1	5
DK	Language	-	-	-
DK	Transformation – industry society to knowledge society	2	4	-
DK	Increased demands for reliability and self-sufficiency	3	2	1
NO	Centralization – large scale operations	-	-	-
NO	Greater demands on social responsibility (CSR)	1	-	6
NO	Cooperation between municipalities – larger units	-	-	-
NO	The quality concept of FM gains higher importance	-	-	-
NO	Increased flexibility – wider spectrum of jobs	-	-	-
NO	Minor class barriers in the working life	-	-	-
NO	New ways working (workplaces)	2	1	5
NO	New demands from employees	-	-	-
NO	Management of core competences	-	-	-
SE	Project based work – new ways of work	5	8	-
SE	Women's role in working life	1	6	3
SE	New generations – new demands and requirements	-	-	-
SE	Higher level of education (higher human capital)	-	-	-
SE	Natural disasters	-	-	-
SE	Job rotation – maintaining skills and experiences	6	2	2
SE	Mix of working life and private life	8	10	-
SE	Infrastructure of work space and work places	10	8	2
SE	New family structures	-	-	-
FI	Professional FM employees – shortage	2	2	6
FI	Longer professional careers	-	-	-
FI	Changes in the public sector	5	3	5
FI	Mindship and work conditions	-	-	-
FI	Area and urban development	5	6	-
FI	Young generation – working styles and places	-	-	-
FI	New services => new workers	-	-	-
FI	Merging of municipalities	-	-	-
FI	New demands for well being	4	4	2
FI	Individualisation of needs	-	-	-
FI	Value profile – changes	3	7	-

TECHNICAL (suggested at the Nordic workshops) Megatrends in the strategic environment		signifi- cance	cer- tain	uncer- tain
DK	Smaller, flexible and mobile ICT devices	-	-	-
NO	Increased automation	-	-	-
SE	New technologies in manufacturing	1	-	4
SE	Green buildings	-	-	-
SE	Information over flow	-	-	-
FI	Smart technologies/materials (e.g. nano)	5	3	3
FI	0-energy buildings and houses	1	3	6
FI	New technologies in the work place	-	-	-

POLITICAL (suggested at the Nordic workshops) Megatrends in the strategic environment		signifi- cance	cer- tain	uncer- tain
DK	Mix of policies under change	1	-	6
DK	Change of legislation related to working life.	2	-	4
NO	Stricter demands on environmental responsibility	2	5	-
SE	Simplified legislation	-	-	-
SE	Changed values/ethics	1	-	2
SE	Change in perception of time	1	1	8
FI	CO2 compensation	5	3	1
FI	Increased regulation – buildings	-	-	-

ECONOMIC (suggested at the Nordic workshops) Megatrends in the strategic environment		signifi- cance	cer- tain	uncer- tain
DK	FM providers move to the markets; FM moves along	-	-	-
DK	Public-Private Partnerships	1	1	6
DK	Individualization of FM services	-	-	-
DK	Targeted FM educations	4	6	-
SE	New systems, e.g. payment, finance	-	-	-
SE	Uncertain economic fluctuations	-	-	-
FI	Public Private Partnerships	-	-	-
FI	New contract models	2	1	5

Most significant trends selected at the Nordic workshops

Category	Megatrends in the strategic environment	Country
Social	Mix of cultures	DK-3
	Demographic change – labour shortage	DK-4&NO-1
	Infrastructure of work space and work places	SE-1
	Mix of working life and private life	SE-3
	Job rotation – maintaining skills and experiences	SE-5
	Project based work – new ways of work	SE-6
	Area and urban development (no megacities in the Nordic area)	FI-2
	Changes in the public sector	FI-3
	New demands for well being	FI-6
Technological	Information and Communication Technology (ICT)	SE-2&NO-2
	Smart technologies/materials (e.g. nano)	FI-4
Economic	Globalisation	DK-2 & SE-4
	Increasing cost pressure	NO-5
Political	Increased focus on sustainability	DK-1&NO-4 & FI-1
	CO2 compensation	FI-5

The discussions at the workshops led to an addition of a large number of other megatrends. In the further process 24 megatrends from the initial list and 27 of the added megatrends were rated. The most significant megatrends identified in the workshops in each of the four Nordic countries are shown in the table above.

By and large the same gross list of megatrends was discussed in the four countries. But it is remarkable that the selection of the most significant megatrends differed between the four countries. Increased focus on sustainability was ranked highest in Denmark and Norway and as 4 in Finland. It was not among the most significant in Sweden, where it was ranked as 9. Demographic change with labour shortage was ranked highest in Norway and as 4 in Denmark. Infrastructure of work space and work places was ranked highest in Sweden, but was not significant in the other countries. ICT was ranked as 2 in Norway and Sweden, but was not significant in the other countries. Globalisation was ranked as 2 in Denmark and as 4 in Sweden, but was not significant in the other countries.

Despite these differences a two more important megatrends might be determined. The first concerns the increased focus on sustainability. The megatrend concerns demographic changes, but the effect of this megatrend is interpreted or experienced differently in each country. In Denmark and Norway focus is on a mix of cultures and shortage of labour on the labour market. In Finland focus is on area and urban development as both industry and dwellings are located differently. For Sweden four megatrends ranked as no. 1, 3, 5 and 6 basically concerned the same overall megatrend of new ways of working and living, and that could also be interpreted as an effect of demographic changes. Issues mentioned where changes in the required infrastructure of work places and work spaces, and a new mix of working life and private life. Also increased job rotation, project based work and other new ways of working can be viewed as a part of this megatrend.

5.2 Current trends and challenges for the FM sector in Denmark/Norway/Sweden/Finland

This part of the workshops was supported by a list of current trends and challenges observed for the FM sector (Jensen and Dannemand Andersen, 2010):

1. Outsourcing.
2. From single service towards multi-service and integrated facilities.
3. From operational towards strategic focus.
4. From cost reduction towards added value before the financial crisis.
5. New forms of procurement - partnership based collaboration.
6. ICT development => changing needs for support of workplaces and infrastructure and for internal process development in the FM supply chain.
7. Increased focus on sustainability and corporate social responsibility creates new FM activities and opportunities.
8. Increased cross-border coordination of FM in multinational companies and use of international service providers.
9. Increasing need for educations on all levels as well as R&D.
10. Pressure for decreasing FM costs per workplace.

This part of the workshop was structured by the following two leading questions:

- Question 1: What keeps a professional FM awake at night right now?
 - In small groups: Discuss and supplement the list of current trends and challenges for the FM sector in Denmark/Norway/Sweden/Finland. Write a PostIt note for each trend/challenge.
 - In plenum: Clustering of trends and challenges.
- Question 2: Identify the most significant trends and challenges in short term and long term.

- Each participant: Indicate by use of five ‘blue dots’ the five most significant trends or challenges in a short term perspective.
- Each participant: Indicate by use of five ‘yellow dots’ the five most significant trends or challenges in a long term perspective.

During the discussions a large number of additional trends and challenges were identified. In the further process 22 were rated in the workshop in Denmark, 12 in Norway, 18 in Sweden and 26 in Finland.

Cluster	Topics from workshop in Denmark	Significance	
		short term	long term
Market development	From multiservice to integrated service. The end user receives all-inclusive contracts.	4	1
	From single service to multiservice.	1	1
	Increased cross-border coordination of FM in multinational companies. Multinational FM actors demand multinational FM providers	2	4
	Service providers: multiservice, professionalism, ‘more standardization’, SLA (service level agreement), etc.	2	-
	Increasing customization of service due to pressure from employees/departments	1	-
Market structure	Many new actors in the field: i) mature of the market, ii) increased competition, iii) from ‘small’ companies to ‘big’ which extends the assortment, iv) harder to overview the market	4	1
	FM in new areas, e.g. public service: care, hospitals, childcare.	2	4
	Moving to new market – contractor taking responsibility for operations (5-30 years)	2	2
	New business models: e.g. ESCO, OPS	2	4
	From internal (zero error culture) to EU contracts and uncertainty management	5	1
Economy	Focus on price efficiency (cost reduction) – not on added value	5	-
	Value added (employee benefits) for clients + cost optimization. Finding the right balance.	1	3
	Cost optimization. Requirement: more (better quality) for less money. Additional purchase → extend the field of business (service providers)	3	3
	Unstable estate markets – realization of surplus estates	3	3
Education	General agreement on need for more education on all levels, but: low participation in new courses. Need for education in sustainability	1	7
ICT	ICT – widespread application in SME is a challenge and risk due to large investments and reorganisations also in service companies	3	1
	ICT – new tools to fewer employees, i.e. more flexibility and documentation on the spot	-	4
	Benchmarking. Structures. Standards.	1	6
Sustainability	Sustainability: energy, environment, branding	5	8
	Politically correct answer: sustainability. But it does not steal sleep. Which mechanisms and incitements drive the development? Who are the front runners?	-	-
In house – outsourcing	Uncertainty what concerns in house/outsourcing. <ul style="list-style-type: none"> • contestability • uncertainty among employees lead to requirements on communication and dissemination 	2	-
	Occupational structure and pressure from trade unions	2	1
	Elucidation of the FM costs used in-house (especially in politically-led organizations)	4	1

Cluster	Topics from workshop in Norway	Significance	
		short term	long term
Market development	Customers move from Total FM deliveries to singly service delivery (often because they were premature or because they were not sufficient prepared)	-	-
	More companies will develop long-term FM strategies – but reluctant to take the first step	4	1
	Too few Total FM enquiries in the market	3	-
	Shared service merges with FM services	-	5
	Expectation management	-	5
Purchase / partnerships	Holistic understanding of value chain and clients needs - added value - new forms of procurement	-	5
	Much control of purchasing	-	-
	Increased use of external consultants in procurement processes	2	-
	Poor knowledge about FM costs makes it difficult to feel secure what concerns outsourcing of FM services and to document the realization of savings	2	-
	Lack of competences - clients / purchaser - provider	3	1
	Immaturity of customers - too much focus at the operational level - not professional clients!	5	-
Politics Frame conditions	Focus on sustainability	-	5
	Sustainability		
	Multi service		
	FM is not clearly defined Spread out a common FM terminology	7	-
	Political development	1	6



Photo from the workshop in Denmark (27 October 2010) illustrating the use of PostIt notes and dots to cluster and priority setting of current trends and challenges for the FM sector in Denmark.

Topics from workshop in Sweden		Significance	
		short term	long term
How to increase productivity from vendors		6	3
Uniform delivery of multiple sites in several countries		3	4
Manage increased costs		-	6
How to increase collaboration between internal service functions		3	-
Sustainability		-	6
TFM or single services		1	2
Clarifying the FM role in organisation and it's services, define core businesses, services		7	-
Advanced knowledge in technical FM related systems (MIS, Digital Real Estate systems)		3	1
In international FM solutions. How to balance the demand on standardised services and at the same time deliver a tailor-made FM operation		-	8
'More for less' – From a customer perspective		2	6
Multi skills (job rotation)		1	1
Preferred single outsourcing – 'the speaking partner'		2	2
Technology & new way to work – meet needs		9	3
How to find cost savings in the third or fourth generation outsourcing		3	1
Added Value	How to succeed in delivering low price FM series and time deliver added value	1	6
	Quality and function important beside price formation	2	
	Added Value	5	1
	Core biz value added	2	-



Workshop in Finland (18 May 2011)

Topics from workshop in Finland	Significance	
	short term	long term
Insourcing and tailor made solutions	3	1
Insourcing rather than outsourcing	1	-
'Come back to the office' & 'No more one size fits all solutions'	2	-
Sustainability	4	5
Energy saving in FM (active energy management, incentives for service providers)	6	-
Sustainable FM service provider is a 'must' in demand site (certificates etc.)	-	-
From kwh measuring to CO2 measuring (carbon foot print)	-	1
Social aspect of sustainability (using local partners for ideological reasons)	-	2
Green thinking (does anyone want to pay for green?)	1	-
'Housing FM'	-	10
New business potential for FM in housing sector (especially senior housing)	1	-
Housing management and building management are getting closer together	-	-
ICT	1	-
Integrated technology solutions	1	5
Strategic focus	3	1
Marketing of FM (increase awareness, importance of certificates)	4	-
Change in management policies (from managing time to managing results)	-	3
Working environment as one of the strategic resources	-	-
From operational focus to strategic (reliable measurement of added value?)	-	1
Reliable measures for adding value (e.g. productivity, sustainability goals, quality)	1	1
Changing markets	4	1
Maturity of markets (can FM be a 'trend-setter'? is the market ready?)	-	-
Nightmare. Small market – just few big service providers, few followers	-	2
Challenge. How to develop new services?	-	1
Mixed use & service & places	1	-
Corporate offices become social interaction nodes	1	3
Cost efficiency (multi users offices and places based on some common core, office buildings into leisure use in spare time)	5	1
Synergy hub	1	4
A mix of residential, commercial + office environments	1	2
Comprehensive mix of services in business parks + offices (work life balance)	4	-
Comprehensive service packages	-	-

Most significant trends and challenges in a short and long term perspective

Country	Current trends and challenges assessed to be most significant in a <u>short</u> time perspective
DK-1	Sustainability: energy, environment, branding.
DK-2	Focus on price efficiency (cost reduction) – not on added value.
DK-3	From internal (zero error culture) to EU contracts and uncertainty management.
DK-4	Elucidation of the FM costs used in-house (especially in politically-led organizations).
DK-5	Many new actors in the field: i) mature of the market, ii) increased competition, iii) from 'small' companies to 'big' which extends the assortment, iv) harder to overview the market.
DK-6	From multiservice to integrated service. The end user receives all-inclusive contracts.
NO-1	FM is not clearly defined. Spread out a common terminology.
NO-2	Immaturity of customers. Too much focus at the operational level. Not professional clients!
NO-3	More companies will develop long-term FM strategies – but reluctant to take the first step.
SE-1	Technology & new way to work – meet needs
SE-2	Clarifying the FM role in organisation and it's services, define core businesses, services
SE-3	How to increase productivity from vendors
SE-4	Added Value
FI-1	Energy saving in FM (active energy management, incentives for service providers)
FI-2	Sustainability
FI-3	Cost efficiency (multi users offices and places based on some common core, office buildings into leisure use in spare time)
FI-4	Marketing of FM (increase awareness, importance of certificates)
FI-5	Changing markets
FI-6	Comprehensive mix of services in business parks + offices (work life balance)

Country	Current trends and challenges assessed to be most significant in a <u>long</u> time perspective
DK-1	Sustainability: energy, environment, branding.
DK-2	General agreement on need for more education on all levels, but: low participation in new courses.
DK-3	Benchmarking. Structures. Standards.
NO-1	Political development
NO-2	Focus on sustainability
NO-3	Holistic understanding of value chain and clients needs (added value and new forms of procurement)
NO-4	Expectation management
NO-5	Shared service merges with FM services
SE-1	In international FM solutions. How to balance the demand on standardised services and at the same time deliver a tailor-made FM operation
SE-2	Manage increased costs
SE-3	Sustainability
SE-4	'More for less' – From a customer perspective
SE-5	How to succeed in delivering low price FM series and time deliver added value
FI-1	Housing FM
FI-2	Integrated technology solutions
FI-3	Sustainability
FI-4	Synergy hubs

The most significant trends and challenges for each country in both the short and the long term are shown in **Table 3**.

Table 3: Most significant trends and challenges for the FM sector in four countries

Country	Short time perspective	Long time perspective
Denmark	Sustainability: energy, environment, branding.	Sustainability: energy, environment, branding
Norway	FM is not clearly defined. Spread out a common terminology.	Political development.
Sweden	Technology and new way to work – meet needs	How to balance the demand on standardised services and at the same time deliver a tailor-made FM operation in international solutions.
Finland	Energy saving in FM (active energy management, incentives for service providers).	Housing FM.

In Denmark sustainability in terms of energy, environment and branding had highest priority in both the short and the long term. For the other countries the priorities between the short term and long term were different. The most important challenge in Norway in the short term was that FM is not clearly defined, indicating a need for further development and dissemination of a common terminology, while the political development (mostly concerned with potential outsourcing of FM tasks from public institutions) was the most important in the long term. In Sweden the highest priority in the short term was to meet needs in relation to technology and new ways of working, while in the long term it was how to balance the demand on standardised services and at the same time deliver a tailor-made FM operation in international FM solutions. In Finland the highest priority in the short term was energy savings in terms of active energy management and incentives for service providers, while in the long term housing FM had highest priority.

Across these national differences three longer term trends and challenges are shared by several countries. Again the challenge related to sustainability and energy is common for all four countries. For Denmark, Sweden and Norway issues related to standards, expectations management, and benchmarking could be considered aspects of the same trend. Finally, workshop participants from both Norway and especially Sweden are focussing on issues related to costs and added value, and the pressure to provide more service for less cost.

5.3 Future need for new competences and new knowledge for the FM professionals

This part of the workshops was supported by a list of FM competences suggested by EuroFM (Jensen and Dannemand Andersen, 2010) structured by use of the following headlines: Managing services; Managing the work environment; Managing resources; Understanding business organization; Managing people and Managing premises.

This part of the workshop was structured by the following two leading questions:

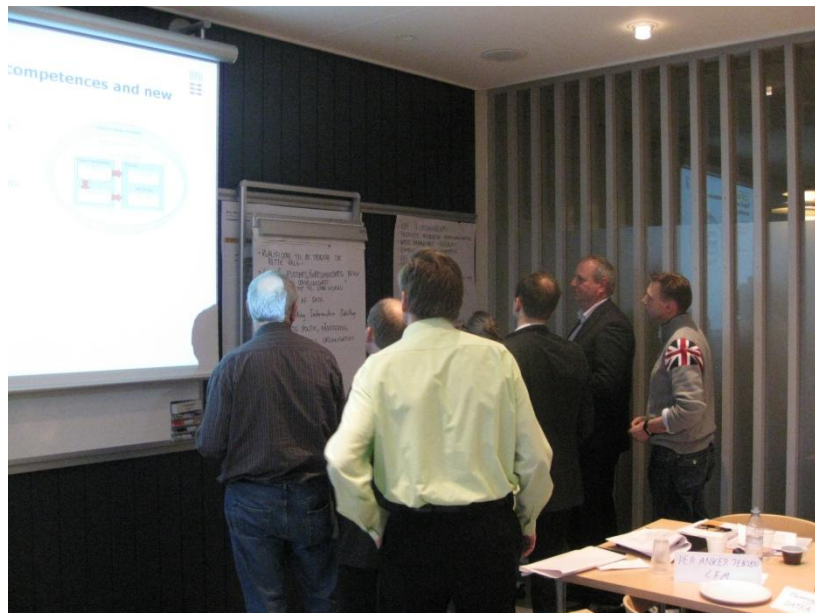
- **Question 1:** *Which needs does the FM sector have for new knowledge and new competences?*
 - In small groups: Discuss the needs for new knowledge and new competences.
 - In plenum: Presenting and writing on flip-over the results of group discussions.
- **Question 2:** *Identify the most significant needs for new knowledge and new competences.*
 - Each participant: Indicate by use of five ‘blue dots’ the five most significant needs for new knowledge and competences.

	Needs for new knowledge and competences	Significance
Denmark	New ICT educations and trainings (especially software)	2
	Ability to keep and attract qualified and professional employees	3
	Waste management – recycling	2
	Communication with marketing departments	-
	Regulation and control of energy systems – education	1
	Specialized cleaning skills and competences (e.g. swimming pools, aeroplanes)	-
	Project + personal management	-
	Strategic: more consciousness about FM at director level	1
	Operational: employees, change of working culture, multi functions and focus on results	3
	Tactic: keep up the good work	-
	Use of existing knowledge from other management disciplines	3
	Apply and maintain existing knowledge – systematic collection of lessons learned	2
	Attitude to service, education	1
	Intelligent use of key figures	6
	Qualify people to make the right choices	5
	Understand client needs, especially in development departments, transfer the understanding to the operational level	10
	Integration of data	1
	BIM – Building Information Modelling	2
	Management of aesthetics and politics	-
	Understand the organisation of companies and their FM strategies	7
Portfolio + space management	6	
Sustainability	5	

	Needs for new knowledge and competences	Significance
Norway	Competence in purchasing – managing two roles: - clarification and grounding of internal needs - purchase and contract with provider	5
	The responsibility of the FM provider	-
	Service as a function	2
	Service as a standard	-
	Service as customer treatment	-
	KPI (key performance indicators)	6
	Development of reliable key figures	5
	Allocation of costs	1
	Process understanding and tools	5
	Systems solutions	4
	New ways of working, consequences for FM	6

	Needs for new knowledge and competences	Significance
Sweden	Understanding organizations and change management	6
	Visibility of FM for top management	5
	Understanding service mindedness	-
	Social ability and personal competences	8
	Learning skills	-
	Understanding the FM concept	5
	Understand customer changes	2
	Manage the gap between customer demands and resources	7
	How to measure added value	8
	The professional status of FM staff	1
	Work place design – understanding psycho social and physical issues (HR skills)	4
	Innovation – thinking out of the box	4

	Needs for new knowledge and competences	Significance
Finland	Green use and maintenance	6
	Urban FM, e.g. development of areas with former industrial properties	9
	Smart and intelligent environment	7
	Consumer perspective, understanding users	-
	Housing FM	7
	Certificates and standards (e.g. combining certificates to taxing, measuring right things)	1
	Integrating FM, HR and ICT	-
	Real life, including practitioners in research and teaching	6
	Marketing FM for all people and employees	2
	Measurement of impact	-
	Implementation of research knowledge	7



Workshop in Denmark (15 Oct 2010)

Most significant needs for new knowledge and competences

During the discussions a large number of other trends and challenges were added. In the further process 17 were rated in Denmark, 8 in Norway, 10 in Sweden and 8 in Finland.

For Denmark and Sweden the highest priority was given to quite soft areas. In Denmark this was to understand client needs, especially in development departments, and transfer the understanding to the operational level, and in Sweden it was social ability and personal competences. For Norway and Finland the highest priorities were more specific. In Norway consequences for FM of new ways of working and KPI (Key Performance Indicators) were highest with the same ranking, while urban FM, e.g. development of areas with former industrial properties, was ranked highest in Finland.

Country	Most significant needs for new knowledge and competences
DK-1	Understand client needs, especially in development departments, transfer the understanding to the operational level
DK-2	Understand the organisation of companies and their FM strategies
DK-3	Portfolio + space management
DK-4	Intelligent use of key figures
NO-1	New ways of working, consequences for FM
NO-2	KPI (key performance indicators)
NO-3	Process understanding and tools
NO-4	Development of reliable key figures
NO-5	Competence in purchasing – managing two roles: i) clarification and grounding of internal needs, and ii) purchase and contract with provider
SE-1	Social ability and personal competences
SE-2	How to measure added value
SE-3	Manage the gap between customer demands and resources
SE-4	Understanding organizations and change management
SE-5	Visibility of FM for top management
SE-6	Understanding the FM concept
FI-1	Urban FM, e.g. development of areas with former industrial properties
FI-2	Smart and intelligent environment
FI-3	Housing FM
FI-4	Implementation of research knowledge
FI-5	Green use and maintenance
FI-6	Real life, including practitioners in research and teaching

5.4 Conclusion from the four Nordic workshops

The only common megatrend in the strategic environments of FM for the next 10-15 years that was ranked high and seen as quite certain in the workshops on FM Futures in Denmark, Norway, Finland and Sweden was an increased focus on sustainability, but this was ranked lower and seen as more uncertain in Sweden than in the other three countries. The influence of globalization was ranked high and seen as quite certain in Denmark and Sweden but not in Norway and Finland. Demographic changes with labour shortage was ranked high and seen as quite certain in Denmark and Norway, but less so in Finland and not at all in Sweden. The influence of ICT was ranked high and seen as quite certain in Norway and Sweden, but less so in Denmark and not in Finland.

The most significant short and long term trends and challenges in the professional FM sector were completely different between the four countries except for an overlap on energy issues in the short term in Denmark and Finland. In Denmark sustainability in terms of energy, environment and branding was the highest ranked trend and challenge in both the short and the long term in Denmark. In Norway the most important short term challenge was that FM is not clearly defined and the need to spread out a common terminology, while the most important long term challenge was identified as the political development. The most significant short term trend and challenge in Sweden was to meet needs in relation to technology and new ways of working, while the most important long term challenge was how to balance the demand on standardised services and at the same time deliver a tailor-made FM operation in international solutions. Finally for Finland the highest ranking short term challenge was energy saving in FM including active energy management and incentives for service providers, while the most significant long term trend and challenge was identified as housing FM.

The future need for new competences and new knowledge for the FM professionals also varied between the four countries. In Denmark the highest ranking new competence was to understand clients' needs. In Sweden the focus was also on soft competences in terms of social abilities and personal competences. In Norway and Finland the focus was on more specific competences. For Norway competences related to the consequences for FM of new ways of working and to KPI's were both ranked highest with the same ranking. The most surprising result was that competences and new knowledge in relation to urban FM was ranked highest in Finland.

6. Workshop CFM's Nordic conference (22 August 2011)

The aim of the workshop was to discuss significant trends and challenges for the FM sector and how the FM professionals can respond to the challenges. 9 Nordic FM professionals participated in the workshop. The workshop was facilitated by Professor Per Dannemand Andersen and Senior Researcher Birgitte Rasmussen from the 'Innovation Systems and Foresight' section at DTU Management Engineering.

The workshop was initiated by a presentation of the future oriented key findings from four Nordic FM futures professional panels (described in section 5). The findings were discussed and supplemented.

Topic	Discussion points
Megatrends in the strategic environment of the FM sector (10-15 years)	development in the public sector municipalities – size and tasks job rotation mix of cultures Norway: focus on labour force Denmark: focus on globalisation and sustainability
Most significant trends and challenges for the FM sector in a short (2-5 years) and a long term (5-10 years) perspective	communication in construction processes communication in operation of properties communication with users about expectations incentives from a FM perspective, optimize construction costs and operating expenses FM will become higher on the agenda it is important to clarify FM concepts and develop a common terminology added value is the important issue for communication OPP in long time horizons
Future needs for new competences and new knowledge for the FM professionals	reliable key figures understand client needs recruitment of manpower at various levels understanding the FM concept branding of the FM sector motivation of young people to join the sector development of the profession, certification
Does it make sense to talk about a Nordic sector	there are differences and similarities between the Nordic countries many providers have their main markets in the Nordic countries the Nordic FM market is part of an international FM market

7. Formulating Statements based on Literature Review and Workshops

The final goal of the project was the formulation of a common Nordic FM strategy on research and education. The strategy will be built on the outcome from a Delphi questionnaire with Nordic FM professionals as respondents. The Delphi questionnaire was prepared on the high priority topics identified at the four Nordic workshops and a literature review on the three dimensions addressed at the workshops.

This chapter presents the outcome of the literature review combined with the workshops. The gross list of topics from workshops and literature review has been structured and clustered in themes with similar content resulting in a list of 22 topics structured in 178 themes. The structuring and clustering have been performed with the FM sector in focus. The inputs from the workshops are mostly keywords and from the literature longer sentences. In the following the themes are presented alphabetic with their associated list of topics. For each topic the source of origin is informed. The themes are not mutual exclusive, because many themes are closely related. Often a topic can be placed in more than one theme. The important point is that the topics are included.

Theme: Added value	
Added Value.	WS SE, 2011
Holistic understanding of value chain and clients needs (added value and new forms of procurement).	WS NO, 2010
How to measure added value.	WS SE, 2011
FM aims at balancing the demand for supporting services with supply of an optimised mix between needs/services levels and capabilities/constrains/costs. To maximise performance and value, it is crucial to align demand and supply based on the economic, organisational and strategic objectives.	Wiggins, 2010

Theme: Building technology and urban development	
Area and urban development	WS FI, 2011
Smart technologies / materials (e.g. nano)	WS FI, 2011
Urban FM e.g. development of areas with former industrial properties	WS FI, 2011
With the emergence of new technologies will come the increasing obsolescence and redundancy of buildings.	Saurin et al., 2008
Building automation.	IFMA, 2007
Sustainable building technologies robust enough to function in challenging environments.	IFMA, 2007
High-performance buildings can have a significant impact on facilities' operations within the workplace environment, and concern for indoor air quality is gaining wider recognition.	IFMA, 2007
As more complex building systems, meant to automate building operation systems, gain momentum in the marketplace, more technologically savvy building operators are needed. A significant challenge to FM professionals is to manage the multiple systems in operation and utilize these systems to their fullest potential.	IFMA, 2007
More and more buildings are being designed using BIM software, which links model-based drafting technology with a database of project information, creating a virtual information model that can be passed from design team to contractor to building owner. FM professionals will be expected to manage facilities based on, and extending, this model.	IFMA, 2007
Management of aging building stocks. New technologies have to be dovetailed with existing systems.	IFMA, 2007
Buildings of tomorrow will need to be smarter to ensure that the traditional downtime associated with the process of reconfiguring office space is minimised. Building mechanical and electrical services will be linked via Internet and intelligent controls to allow the services to be easily configured and reconfigures.	Wiggins, 2010

We are managing the largest collection of aging buildings in modern history - the logical result of decades of growth followed by decades of restraint. Deferred maintenance challenges are becoming overwhelming; we still lack sufficient preventive and capital maintenance budgets to do the job. The weakened state of many of our physical assets is pushing us towards new/replacement facilities we can ill afford and away from facility reinvestment and renovation that could otherwise have been a viable option. Moreover, so much has changed in the way we do business, the way we work and the demands of the consumer that these inflexible, aging facilities are often just not up to the modern job.	Balmer and Clarke, 2010
Buildings have traditionally contained a number of separate and increasingly sophisticated systems (heating, security, lighting, waste management, etc.) - building automation systems (BAS). We are rapidly moving towards integration, a single BAS - driven by the need for efficiency, holistic green concepts and the logic of integrated resource management. Building Information Modeling (BIM) creates a virtual information model that can be passed from design team, to contractor, to building owner. Everything is coming together through platform software providing a common portal - Integrated Workplace Management Systems (IWMS).	Balmer and Clarke, 2010
The built-environment construction industry (BECI) in ten to fifteen years time will in many ways not be dissimilar from today's. However we see four factors as being dominant at that time: climate change; demographics (affecting both the nature of demand on the BECI products and supply of an appropriately skilled work force); funding; and technological developments (particularly an increase in intelligence at all levels of the built environment: materials, components, buildings, cities, regions; and organisations), much of which will originate outside of the BECI. These dominant factors imply: i) The need to take a more integrative, interdisciplinary, whole life-cycle view of building development, delivery and operation – this calls for a systems oriented, holistic approach to project work; ii) A focus on technology adoption; iii) New knowledge management practices; iv) Opportunities to improve the industry's competitiveness.	National Platform for the Built Environment, 2008

Theme: Business models and markets	
Shared service merges with FM services.	WS NO, 2010
Understand client needs, especially in development departments, transfer the understanding to the operational level.	WS DK, 2010
Competence in purchasing – managing two roles: i) clarification and grounding of internal needs, and ii) purchase and contract with provider.	WS NO, 2010
Understanding organizations and change management.	WS SE, 2011
Understand the organisation of companies and their FM strategies.	WS DK, 2010
Changes in the public sector	WS FI, 2011
Changing markets	WS FI, 2011
Housing FM	WS FI, 2011
Business models will change dramatically. Technology, globalisation, demographics and other factors will influence organisational structures and cultures.	Pricewaterhouse-Coopers, 2007
FM needs to be transnational in practice and to be able to mediate between global, regional and national pressures.	Grimshaw, 2003
Broadening and deepening of the engagement between the private and public sectors in the provision of community services.	Roberts, 2004
More complex, but also more radical – pulling together agencies responsible for social services, health services, voluntary services and community and media information services.	Roberts, 2004
Leasing vs. owning: budget disincentives and legislation often favour costly short-term leasing rather than long-term ownership.	IFMA, 2007
Maturing FM industry and increasing competition to win business.	Wiggins, 2010
The move away from ownership of corporate real estate to leasing of buy-back deals will continue. Companies are under pressure to release and re-use the capital tied up in real estate, putting this money to be better use often through investment in their core business.	Wiggins, 2010

Theme: Climate and environment	
Climate change – impact of weather, natural disasters, food production, use of natural resources.	Wiggins, 2010
The reality of climate change is now recognized, due to both natural causes and mankind's industrialization ethos.	Saurin et al., 2008
Accelerating climate change impacts will threaten food and water supplies, human health, and terrestrial and marine life. Europe may also see more human migration and aggravated pressure on resources supplies.	EEA, 2010
An increasingly complex mix of pollutants threatens the Earth's regulatory mechanisms. Particulates, nitrogen and ground-level ozone merit particular attention because of their complex and potentially far-reaching effects on ecosystem functioning, climate regulation and human health. In addition, many other chemical substances are released into the environment, with effects — in isolation or combined — that are still poorly understood.	EEA, 2010

Theme: Competences and education	
Process understanding and tools.	WS NO, 2010
Social ability and personal competences.	WS SE, 2011
Implementation of research knowledge	WS FI, 2011
Targeted FM educations.	WS DK, 2010
General agreement on need for more education on all levels, but: low participation in new courses.	WS DK, 2010
Real life, including practitioners in research and teaching	WS FI, 2011
Closer integration with other business support services such as HR and IT.	Wiggins, 2010
Facilities with more enticing amenities to attract the best class of employees and get the best out of them. More integrated workspaces to foster creativity and innovation.	Wiggins, 2010
Interpersonal skills. As work becomes more knowledge-centric, the ability to communicate ideas and persuade others is the dominant currency. The complexity of specialisations gives rise to the role of intermediary.	Chartered Management Institute, 2008
FM professionals must become educated about regulatory acts (in each country in which they work) that will continue to add layers of complexity to the business environment.	IFMA, 2007
The rapid pace of change will necessitate that FM professionals develop skill sets that cover a variety of areas (security, strategic planning, energy management, productivity measurement, negotiation strategies, sourced services management, project team building, innovation, motivation training, cultural diversity, entrepreneurial values, adaptability, multi-lingual capabilities).	IFMA, 2007
Leadership development. There is a need to develop tomorrow's leaders. Involvement through industry associations is a valuable source of training to active professionals. Real estate professionals need leadership skills.	IFMA, 2007
..., they must be competent to deal with complex problems, assume high levels of responsibility, have the ability to affects the workplaces of the future and be able to deal with all levels of an organisation and its suppliers, consultants and providers.	Wiggins, 2006

Theme: Cost efficiency	
Increasing cost pressure	WS NO, 2010
Focus on price efficiency (cost reduction) – not on added value.	WS DK, 2010
Elucidation of the FM costs used in-house (especially in politically-led organizations).	WS DK, 2010
Manage increased costs	WS SE, 2011
'More for less' – From a customer perspective	WS SE, 2011
How to increase productivity from vendors	WS SE, 2011
Manage the gap between customer demands and resources	WS SE, 2011
Cost efficiency (multi users offices and places based on some common core, office buildings into leisure use in spare time)	WS FI, 2011
Synergy hubs	WS FI, 2011

Change management including changes in operations, construction escalation, continued demands to increase efficiency, regulatory changes (local codes and regulations will vary by region /country)	IFMA, 2007
The facility designer, developer and manager must deliver strategic value in both short and long term. The greatest challenges relate to the need to maintain flexibility, knowing with certainty that functionality, technology and worker/customer demands will change dramatically over time. Now and in the future, the emphasis will be on maximizing usage and practicality - while adopting every new approach that clearly offers return on investment.	Balmer and Clarke, 2010

Theme: Culture	
Mix of cultures	WS DK, 2010
Cultural and generation preferences will manifest themselves in distinctive working styles calling for a large portfolio of FM solutions.	IFMA, 2007
Tomorrow's workforce will be increasingly individualistic, older, more mobile, more international and ethnically varied and, in the cases of skilled employees, far more demanding of their employers. Tomorrow's managers will have the unenviable task of trying to harness these forces of change rather than being overwhelmed by them. Such a task will require them to be flexible and creative.	Chartered Management Institute, 2008
The twenty-first century will see the culture of universal education.	Saurin et al., 2008
Broadening diversity in the work force.	IFMA, 2007

Theme: Demographic	
Demographic change – labour shortage.	WS DK, 2010 WS NO, 2011
Changing demographics. Aging population and increased immigration will affect the workforce in the future.	IFMA, 2007
Changing demographics with ageing western populations, and migrations across borders.	Wiggins, 2010
Rapid population growth.	IFMA, 2007
The global population will still be growing midway through the 21st century but at a slower rate than in the past. People will live longer, be better educated and migrate more. Some populations will increase as others shrink. Migration is only one of the unpredictable prospects for Europe and the world.	EEA, 2010
Ageing societies. Opinions differ on how exactly demand for infrastructure will change as societies age, but among the clear implications for the Engineering & Construction industry's business environment are that ageing societies will put pressure on the tax revenues available for infrastructure work and will impact the available labour force. According to the United Nations, while now one in 10 of the world's population is aged 60 or above, by 2050 that figure will have risen to one in five. There will be strong regional differences, but societies will age more rapidly in developing countries than in developed countries.	World Economic Forum, 2007
Shortages of skilled labor in certain areas.	IFMA, 2007
Labour skills and availability of suitable entrants to FM, including competition from other professions.	Wiggins, 2010
People management will present one of the greatest business challenges.	Pricewaterhouse-Coopers, 2007
The role of HR will undergo fundamental change.	Pricewaterhouse-Coopers, 2007
Less property and real estate needed for a shrinking workforce.	Wiggins, 2010

Theme: Emergency preparedness	
Emergency preparedness including basic safety and security, acts of terrorism, natural disasters, workplace violence, pandemic crises, chemical/biological incidents, data protection.	IFMA, 2007
There is a growing concern for global techno-crime, as well as the emergence of spam wars, viruses and threats across the internet platform.	Saurin et al., 2008
Global terrorism and fundamentalism.	Wiggins, 2010
The risk of exposure to new, emerging and re-emerging diseases, to accidents and new pandemics grows with increased mobility of people and goods, climate change and poverty. Vulnerable Europeans could feel them keenly.	EEA, 2010
Risk Management awareness and accountability is both increasing and becoming more complex in response to: <ul style="list-style-type: none"> • our new awareness of the potential of terrorism to disrupt operations and lives • increasing sensitivity to threats related to large scale natural disasters • enhanced awareness of health threats and the related responsibilities of anyone or any facility that congregates large numbers of workers and/or customers • our increasing reliance on data and information for business continuity 	Balmer and Clarke, 2010
The breakneck pace of technological change brings risks and opportunities, not least for developed regions like Europe. These include in particular the emerging cluster of nanotechnology, biotechnology, and information and communication technology. Innovations offer immense opportunities for the environment but can also cause enormous problems if risks are not regulated adequately.	EEA, 2010
Highly repetitive work, or work in difficult environments will increasingly be undertaken by robotics and micro-robotics.	Saurin et al., 2008

Theme: FM concept and terminology	
FM is not clearly defined. Spread out a common terminology.	NO WS, 2011
Understanding the FM concept.	SE WS, 2010
The lack of conceptual or theoretical management framework is perhaps in part the reason why FM remains misunderstood in the general business sector.	McLennan, 2004
Benchmarking. Structures. Standards.	WS DK, 2010

Theme: FM role	
Clarifying the FM role in organisation and it's services, define core businesses, services.	WS SW, 2010
Visibility of FM for top management.	WS SE, 2011
Marketing of FM (increase awareness, importance of certificates)	WS FI, 2011
A critical facet of successful facility management is the ability to link the role of facilities to an organisation's core business strategy. In the coming years, we believe this will be of even greater importance.	IFMA, 2007
Efficiency and Cost Control pressures and measures have been in place for some time. What is changing is the growing realization that past cost cutting approaches may have harmed our ability to be productive and to produce quality product or service - both critical to success and even survival in an increasingly competitive age. Facility managers are increasingly seen to be part of the solution and facilities themselves are now been seen as critical strategic assets, not simply costs to be controlled.	Balmer and Clarke, 2010

Theme: Globalisation	
Globalisation.	WS DK, 2010 WS SE, 2011
Globalization and increased infrastructure. The need to bridge larger physical operating distances; facilitate productive work across various geographic locales; address differences in mobility, communication tools, culture, languages, laws, regulations, measurements, educations, etc.	IFMA, 2007
A mobility explosion is emerging which will expose people to new places.	Saurin et al., 2008

Global competition, including the rise of China, India, Russia and Brazil as major players in the industrialised economy.	Wiggins, 2010
Global financial situation – cost of money, availability of credit and worldwide debt.	Wiggins, 2010
World power – shift of power from older western economies to new emerging economies.	Wiggins, 2010
Global power is shifting. One superpower no longer holds sway and regional power blocs are increasingly important, economically and diplomatically. As global interdependence and trade expands, Europe may benefit from improving its resource efficiency and knowledge-based economy.	EEA, 2010
Globalization and global economic growth. Economic growth is the major driver of demand for infrastructure, and the rate of globalization influences GDP growth through its impact on cross-border flow of products, services, capital and talent. The average annual global GDP growth between now and 2020 is estimated to reach between 2.5% and 4%, depending on how globalization progresses. There are signs suggesting we may be at risk of an overall retrenchment from globalization such as rising geopolitical instability and the spread of political populism in Europe and the US. Will globalization progress and support high GDP growth, or will there be retrenchment from globalization?	World Economic Forum, 2007
In a knowledge-based economy the prerequisite for survival will be global competitiveness, not just in the traditional sense of market leadership, but increasingly in the discovery and exploration of new markets.	Saurin et al., 2008
Political impact of business across national boundaries – the future composition of the European Union.	Wiggins, 2010
Power shifts resulting from the explosive growth in China and India are now tipping the power of the West on its hinges as the global governance structure of the G8 summit is being reformed.	Saurin et al., 2008
More global outsourcing of business support to countries such as India and other developing countries.	Wiggins, 2010

Theme: ICT	
Information and Communication Technology (ICT).	WS SE, 2011 WS NO, 2010
Smart and intelligent environment	WS FI, 2011
Integrated technology solutions	WS FI, 2011
Converging technologies (video, voice, data, satellite, IP, radio).	Wiggins, 2010
Ubiquitous wireless technology will lead to a growth in sustainable remote and flexible working.	Saurin et al., 2008
The world wide web is growing exponentially and globally.	Saurin et al., 2008
Companies are more accountable about their values and behaviours and corporate social responsibility practices. This is because of increased public reporting and scrutiny, media coverage and other communication tools such as the internet that connect different stakeholders.	Chartered Management Institute, 2008

Theme: Key figures	
Intelligent use of key figures	WS DK, 2010
KPI (key performance indicators)	WS NO, 2010
Development of reliable key figures	WS NO, 2010

Theme: Management	
From internal (zero error culture) to EU contracts and uncertainty management.	WS DK, 2010
Expectation management.	WS NO, 2011
In international FM solutions. How to balance the demand on standardised services and at the same time deliver a tailor-made FM operation.	WS SE, 2011
The FM must deploy his managerial skills to step back from day-to-day tasks and find time to look longer term, into the future, to ensure that the buildings he manages today are the buildings that will suit the organisations tomorrow.	Wiggins, 2010
Facility managers are now required to rise above the tactics related to management of their property and participate fully at the corporate strategy level. Buildings and other assets must be developed and managed so as to complement brand, support corporate culture, and contribute broader value to the communities they serve. As a key business element, each facility will have to be conceptualized, created and operated to support productivity, innovation, worker satisfaction and positive public perception.	Balmer and Clarke, 2010

Theme: Project and portfolio management	
Project based work – new ways of work.	SE WS, 2010
Mixed-use urban projects are becoming more desirable, but are creating new, more complex challenges for facility management professionals	IFMA, 2007
The qualities required of facilities manager's in the future will include excellent communication and negotiation skills; efficient management of projects and budgets; and effective balance of conflicting needs.	Wiggins, 2006
From multiservice to integrated service. The end user receives all-inclusive contracts.	DK WS, 2010
Portfolio + space management.	DK WS, 2010
Facility managers are increasingly required to handle complexity and the pace of change AND to support others dealing with the same pressures. It is not longer acceptable to simply wait to be somewhat overwhelmed and respond once the industry has come to agreement on new best practices or standards; our competitive environment requires more proactive approaches. Facility managers will increasingly be called upon to anticipate changing needs and to work with building stakeholders to manage with foresight.	Balmer and Clarke, 2010

Theme: Purchase / partnerships	
In both outsourced and PFI/PPP relationships, there is an ongoing need to be able measure performance against the contract SLAs.	Wiggins, 2010
With truly integrated performance measurement systems, the various parties involved in service provision will be able to develop a more effective management of the contract; continuous improvement and better partnerships.	Wiggins, 2010
Larger integrated FM contracts as more organisations are operating across international boundaries.	Wiggins, 2010
The maturity of PFI/PPP market.	Wiggins, 2010
Larger contracts with reward linked to performance.	Wiggins, 2010
A coherent and convincing demand-side position still needs to be put in place: i) to demonstrate the value of property and facility management to corporate strategy within business, public and community enterprises of all kinds – this will be a complex and difficult task; ii) to support business operations and work processes, employees, customers and consumers – an easier task; iii) to progress the areas of common purpose between business and community objectives, corporate and individual concerns and cross-sector interests and priorities; iv) to reconcile the short-term demands of business and customer expectations with the long term provision of sustainable infrastructure and management support systems; and v) to brand and market a coherent business platform to support future developments.	Nutt, 2004

Theme: Regulation, policy, legislation	
CO2 compensation	WS FI, 2011
Legislation to protect the environment and the people in it	Wiggins, 2010
Climate change policies. Climate change has become a top issue on the global agenda, and climate change policies hold great uncertainty in light of the long project cycles for capital projects. Since the Kyoto protocol on climate change entered into force in 2005, a broad range of countries has made progress on carbon emission reduction, but the protocol's full execution has been hindered by a variety of issues. Talks have already begun on what is to follow the end of the Kyoto protocol in 2012. In parallel we see other climate change initiatives such as the Asia-Pacific Partnership on Clean Development and Climate, and the Regional Greenhouse Gas Initiative. What new climate change policies will be put in place, and by whom? How, and at what governance level, will they be enforced? How will they impact the demand for and execution of capital projects?	World Economic Forum, 2007
Dedicated management of natural capital and ecosystem services emerges as a compelling integrating concept for managing the links between global drivers and the four priorities of the EU's 6th Environmental Action Program.	EEA, 2010
Regulatory context. Building regulations, employment and environmental laws all have significant impacts on the Engineering & Construction sector. Governments increasingly use building regulations to impose environmental standards and to stimulate innovation, while employment laws impact on the availability of labour. Regulations also strongly affect market structure, the costs of doing business, country competitiveness, the degree of market liberalization and the extent and impact of globalization. At what level of governance will regulations be defined – local, national, regional, global? How stable will the regulatory context be – will regulations affecting E&C be integrated into long-term development plans or vulnerable to the shifting priorities of changing political regimes?	World Economic Forum, 2007
Employers must comply with a growing body of legislation which aims to reduce age, disability and sex discrimination. The last decade has seen the introduction of workplace legislation focusing on, for example, equal pay, flexible working, maternity leave, paid paternity leave and equal rights for part time workers.	Chartered Management Institute, 2008
The world is devising new governance models, including multilateral agreements on numerous issues and public-private ventures. In the absence of global regulation, advanced European standards and procedures have often been adopted worldwide. But will this situation continue in the future?	EEA, 2010
Reflecting global megatrends in policymaking poses three related but distinct challenges. These relate to reviewing the approaches for assessing future change, embedding long-term perspectives in policy planning and decisions, and ensuring that environmental policy takes account of global links and is aligned to external policies on, for example, trade and aid.	EEA, 2010

Theme: Resources	
Energy saving in FM (active energy management, incentives for service providers)	WS FI, 2011
There is a greater demand for and limited supply of energy, water and other vital resources, such as intellectual resources.	Saurin et al., 2008
How will Europe survive in the intensifying scramble for scarce resources? The answer may lie in more efficient production and resource use, new technologies, innovation and increasing cooperation with foreign partners.	EEA, 2010
Rapid growth accelerates consumption and resource use. But it also creates economic dynamism that fuels technological innovation, potentially offering new approaches for addressing environmental problems and increasing resource efficiency.	EEA, 2010
Limitation of energy resources.	IFMA, 2007
Increase travel costs will provide financial incentives for step changes towards increased use of videoconferencing.	Saurin et al., 2008
A larger and richer global population, with expanding consumption needs, will place growing demands on natural systems to provide food, water and energy. European resource stocks may likewise face increasing pressures.	EEA, 2010

Theme: Sustainability	
Increased focus on sustainability.	WS DK, 2010 WS NO, 2011 WS FI, 2011
Increased focus on sustainability and corporate social responsibility creates new FM activities and opportunities.	
Sustainability: energy, environment, branding.	WS DK, 2010
Focus on sustainability.	WS NO, 2011
Sustainability.	WS SE, 2010 WS FI, 2011
Green use and maintenance	WS FI, 2011
Sustainability continues to grow in importance and has rather quickly moved from an optional nicety to a fundamental requirement and expectation across many industries.	IFMA, 2007
One major issue on the contentious environmental agenda is the role of the corporation towards protecting the planet, with the debate focusing on trade versus sustainability.	Saurin et al., 2008
For FM professionals, energy conservation remains the greatest long-term method of stretching limited resources (as opposed to developing new technologies).	IFMA, 2007
Sustainability remains a dominant challenge or trend in facility management, with emphasis shifting rapidly from a focus on cost control, to a more balanced approach that emphasizes the triple bottom line, corporate responsibility, brand and image. Integrated resource management approaches are of increasing interest. Energy management systems will be part of a smart grid, with many facilities generating/contributing; load management strategies will be common place. Water management is emerging as the critical priority as the world gradually accepts the vulnerability of this critical resource.	Balmer and Clarke, 2010

Theme: Values	
New demands for well-being	WS FI, 2011
Nature of demand. The type of client influences the contractual arrangements of capital projects: notably, whether the emphasis is more on schedule and price or focuses more on long-term social and environmental impacts. Industrial clients, government and public bodies, financial institutions and developers each have their own objectives and constraints. The market proportion of these entities in the E&C market will strongly impact the nature of demand. Who will be the clients for E&C services and what will they value?	World Economic Forum, 2007
A wider range of ages and physical abilities in the population requires greater concern for ergonomics in FM.	IFMA, 2007
Developing countries are the focus of much debate over the issue of employee exploitation, child labour and sweatshops, particularly in the context of the global economy.	Saurin et al., 2008
The power of business is very different to the power of government. Corporations focus on markets, profits, growth, survival and competition. However, there is an emerging trend towards increasing corporate social responsibility to deal with social and cultural matters, education and health and safety.	Saurin et al., 2008

Theme: Working life and styles	
Infrastructure of work space and work places.	WS SE, 2011
Job rotation – maintaining skills and experiences.	WS SE, 2011
Technology & new way to work – meet needs.	WS SE, 2011
New ways of working, consequences for FM.	WS NO, 2010
Technology will impact businesses significantly by transforming supply chains, business models, and work styles.	Saurin et al., 2008
In the developed world the workplace is experiencing a dynamic transformation from a	Saurin et al., 2008

manufacturing to a knowledge economy where technology and the creation of services is dominant .	
There is an emergence of the new uber-knowledge workers that are capable of working anywhere and demand high-quality environments.	Saurin et al., 2008
Corporate cultures and governance influencing the structure of business.	Wiggins, 2010
People and businesses will increasingly exhibit the behavioural characteristics of a 'swarm society', grouping together on the basis of elective affinities and shared interests.	Saurin et al., 2008
We are all human resource managers (regardless of the level at which we work) and more than ever must learn to cope with the challenges of an aging workforce, cultural diversity in the workplace, demand for increased workplace quality and the need to house a number of different and not always complimentary workstyles. Moreover, modern information and communication technology is reducing the need to work at a single workstation - many modern managers and workers are highly mobile.	Balmer and Clarke, 2010
The upshot is a trend in employees working away from the traditional office and the obvious implications that in the future the office will not be the place where people go to do individual work. It has to be where high value social interaction takes place and little else. ... It would be wise if FM responded to the changing spatial and temporal relationship between organisation and employee by aiming to support work wherever it takes place across the network. ... FM is faced with two problems: how to extend its function to support work across organisational networks and how to make workplace nodes within the network effective.	Grimshaw, 2007
Infrastructure to support 'working on the move' as business have to react more quickly to market changes and customer demands. Multiple work locations for employees to increase flexibility of the workforce.	Wiggins, 2010
Professional must be allied to a new and more effective approach to planning and implementing change, around the following three tenets. (1) With increasing requirements for mobility, traditional concepts of the PwC working environment and in particular, office space, will be rendered redundant. We must fully adopt the "work is where you are" principle. (2) With the ever increasing diversity of our people and the vagaries of the marketplace, the single most important job of the future property professional is to ensure that the working environment be both adaptive and agile, capable of responding quickly to the changing demands of corporate strategy as well as individual requirements. (3) Property professionals will have to further integrate into operations landscape, taking a more holistic view in regards to investment, combining benefits and risk to understand the real value of action. . . and that less can be more.	Young, 2004
Mix of working life and private life.	WS SE, 2011
Comprehensive mix of services in business parks + offices (work life balance)	WS FI, 2011
There is an increasing awareness for the need to balance quality of life and work. Yet in some developed nations, income prosperity does not translate into an improved quality of life due to chronic congestion, inadequate housing provision, to name but a few.	Saurin et al., 2008

8. Preparation of the Delphi Survey

8.1 Introduction

A Delphi survey is a consultation process involving a wide group of dispersed participants. It can be characterised as a systematic method for eliciting and collating informed judgements on a particular issue, through the circulation of a carefully designed questionnaire to participants, who are mainly experts in the relevant field(s). Taking its name from the location of the oracle in the Ancient Greek, the Delphi method was developed by the RAND Corporation in the USA in the early 1950s.

The process applies a set of predefined questions to seek expert opinions. Delphi practitioners follow best practice guidelines when constructing questions so that questions elicit opinions about future timings without seeking binary choices or predictions. Participant opinions are sought on when events are likely to happen and on their underlying influences. Delphi is particularly useful in situations where the participants are physically distributed as anonymity of response is an essential characteristic of a Delphi process. This helps to ensure that independent opinions are gathered and that groupthink is avoided.

Looking at the present project, the overall target was to contribute to the preparation of a Nordic FM strategy on research and education. Therefore, a key aspect at the project will be to identify the content and extent of common Nordic FM competence and knowledge needs which will be achievable as well as attractive for the Nordic FM professionals.

8.2 Formulation of statements

In Delphi based foresight exercises expected future developments are formulated as statements. The essential features of a Delphi survey are that a group of experts is asked to respond to questions on a series of statements about the future. According to Loveridge et al. (1995) “*A statement must be a concise expression of the event, achievements or other phenomenon upon which views are sought. In as few words as possible, an unambiguous expression of what the questioner has in mind must be achieved, which incorporates any key conditions, but which excludes separate issues that warrant one or more additional topics*”.

Formulation of statements is a time-consuming process, and although, they are the essential building blocks of a Delphi survey only few recommendations can be found for the formulation of statements:

- It has to be made clear where the statements come from (FOR-LEARN).
- Statements can be even more precise in their formulation through the use of quantitative representations (Loveridge et al. 1995).

Further, statements can be related to the state of development, see **Figure 13**:

- Development: First development of a new principle, FM service or first development of a new market for existing FM services
- Introduction: Introduction of a new principle or FM service on a market
- Widespread use: Widespread (and still increasing) use of a principle or FM service on a market
- Declining use: declining use of a principle or FM service on a market

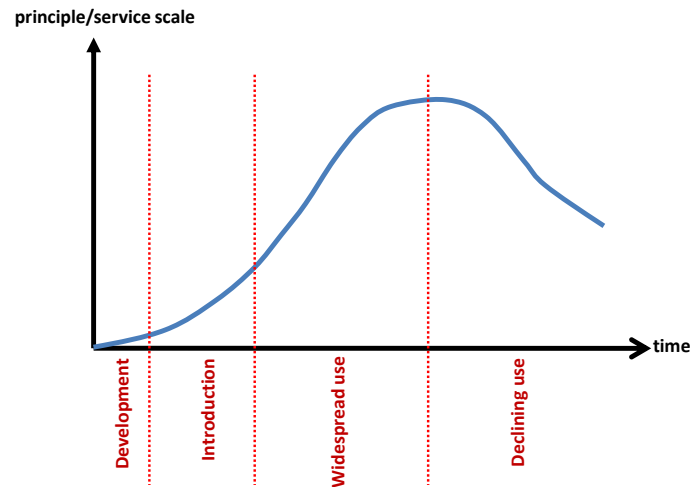


Figure 13. Development stages and the corresponding use of the principle/service

Furthermore, to complement these recommendations our advice is to consider aspects related to the sectoral innovation system in the formulation of Delphi statements. Addressing specific the FM sectoral innovation system, the five elements indicated in **Figure 14** can be considered during the statement formulation process:

- A. concerns present and future forces in the external environment affected the development of the FM innovation system
- B. concerns the providers of FM services
- C. concerns the FM products or services
- D. concerns FM clients or the area of application for FM services
- E. concerns the generation and transfer of expertise and skills; here the focus might be on academic disciplines and practical skills required for the topic of the statement

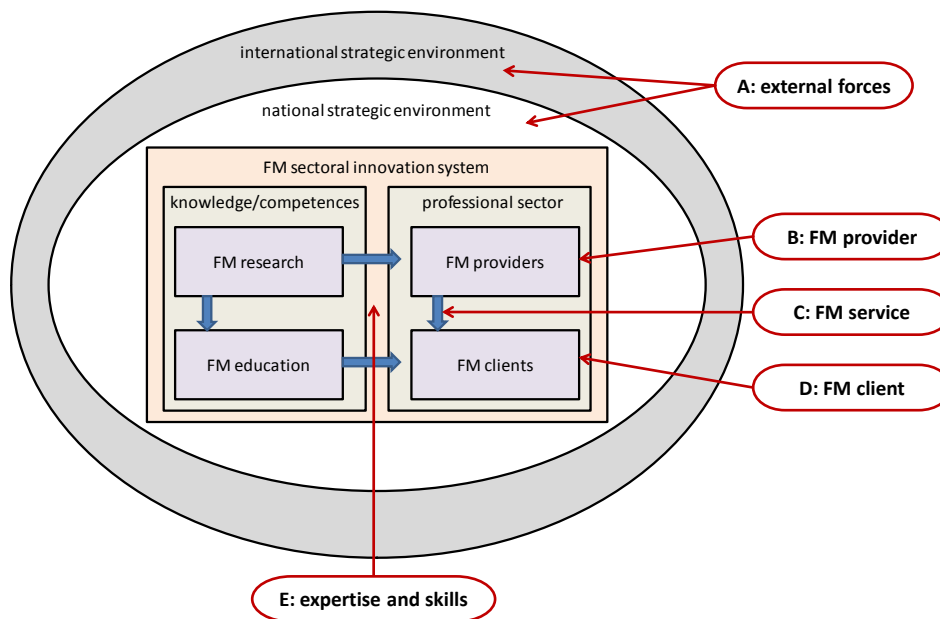


Figure 14. The FM sectoral innovation system and important elements in the formulation of statements

The formulation of statements for the foresight on facilities management has been carried out as a two step process. First for each of the 22 themes the topics placed in the group has been collated and rewritten in order to formulate 50 draft statements for the Delphi survey, see **Table 4**.

Table 4. *Formulation of statements step I: formulation of 50 draft statements grouped in 22 themes*

Themes	Statement
Added value	Introduction of a set of principles for measurement and documentation of the added value by FM services
Building technology and urban development	Introduction of FM systems to efficient management of multiple and complex building systems
	Development of FM services meeting the requirements of robust operation of facilities due to uncertainties related to impacts and effects from climate changes on facilities
	Widespread use of merged FM services for both aging building stocks and new building systems
	Widespread use and integration of FM services in urban development of former industrial areas
	Introduction of FM services based on BIM (Building Information Modelling)
	Introduction of FM services using software platforms (Integrated Workplace Management Systems – IWMS) integrating building automation systems (BAS) and Building Information Modelling (BIM)
	Development of cross disciplinary, life-cycle oriented and holistic FM services for building development, delivery and operation
Business models and markets	Widespread use of FM services following the investments moving from ownership of corporate real estate to leasing of buy-back deals
	Introduction of FM services integrating private and public sectors in the provision of community services
Climate and environment	Development of FM services meeting the requirements of robust operation of facilities due to uncertainties related to impacts and effects from climate changes on facilities
Competences and education	Introduction of a Nordic FM professional network for sharing of knowledge and experiences across industries and application areas
	Widespread use of knowledge transfer from scientific communities to FM providers and FM clients related to FM services
	Introduction of FM standards and services integrating human resource management
Cost efficiency	Introduction of a methodology to highlight and ascertain return of investment for the organisation of the FM costs spent in-house
	Introduction of FM services providing strategic value for FM clients with continuously changing functionality, technology and worker/customer demands
Culture	New operational skills for FM providers due to new demands for mobile FM services meeting the increasing mobility of the workforce
	Introduction of adaptive and flexible FM services meeting the constantly changing work place conditions due to mixing of work forces with different cultural preferences
Demographic	Introduction of a wide range of attractive FM educations in order to counter shortage of FM professionals due to ageing populations in western populations and competition from other professions
	Pressure on efficient FM services due to need for less property and real estate as a consequence of a shrinking (manufacturing?) workforce in the Nordic countries
ICT	New operational skills for FM providers and demand for flexible FM services due to continuously changing work places and hours by widespread use of wireless technologies
	Introduction of FM services based on integrated ICT solutions in intelligent monitoring, configuration and reconfiguration of facilities.

Emergency preparedness	Introduction of FM services with specific focus on security to cope with techno-crime threatening internet platforms, ICT, etc.
	Introduction of FM services also comprising assessment and management of health risks and environmental risks of new technologies and materials
FM concept and terminology	Development of a common conceptual FM terminology applied within a professional FM management framework
	Introduction of methodologies for benchmarking of FM services and standards across areas of applications
FM role	Introduction of methodologies for FM becoming a critical strategic management tool linking the role of facilities to the organisation's core business strategy
	Introduction of strategic communication tools to make FM services transparent and visible for CEOs
Globalisation	Introduction of new skills and expertise for outsourcing of FM business support and FM services to developing countries
	Development of new markets and new partners for FM services due to shift from developed 'western' economies to emerging economies
	Introduction of FM services managing facilities across larger physical operating distances and various geographical locations
Key figures	Development of reliable key figures and key performance indicators for FM services
	Introduction of key figures and key performance indicators in FM services
Management	Development of new strategic skills to identify and manage uncertainties and expectations in FM services
	Introduction of strategic management balancing the demand for modularisation and standardisation of FM services and at the same time deliver tailor-made FM operations
Project and portfolio management	Introduction of agile and proactive FM services for use in management of complex spaces and project portfolios
	Widespread use of all-inclusive FM contracts in urban development projects
Purchase / partnerships	Introduction of methodology for measurement of performance against service level agreement (SLA)
	Widespread use of PFI/PPP relationships and markets in FM
Regulation, policy, legislation	Integrating carbon emission reduction as a strategic management tool in FM services
	Introduction of FM strategies to take advantage on the increasingly governmental use of building regulations to impose environmental standards
Resources	Introduction of methodologies for energy saving management in FM services
	FM services as a management tool to prevent environmental problems and more efficient and effective use of natural resources
Sustainability	Sustainability is a fundamental requirement in FM services across most client groups
	Sustainability is more important in FM services than corporate social responsibility (CSR)
Values	Provision of FM services integrating the new requirements for well-being and ergonomics varying between different segments in society (or clusters of FM clients)
	Provision of FM services meeting the increasing demand of corporate social responsibility (CSR)
Working life and style	Introduction of FM services for working environments with a larger number of different and not always complementary work styles
	Introduction of FM services to support highly mobile work wherever it takes place
	Introduction of FM services to dispersed actor groups with shared interests (clusters of FM clients)

The second step was to prepare statements suitable and operational in the Delphi survey. Therefore, the number of themes and statements were simplified and reduced. The result was 40 simplified statements clustered in 6 overall themes as presented in the following.

Working life and style	
1	Introduction of FM services for working environments with a larger number of different work styles
2	Introduction of FM services to support highly mobile work wherever it takes place
3	Provision of FM services integrating new requirements for well-being and ergonomics
4	Introduction of adaptive and flexible FM services meeting the constantly changing work place conditions

Resources and sustainability	
5	Introduction of methodologies for energy saving management in FM services
6	Provision of FM services meeting the increasing demand of corporate social responsibility (CSR)
7	FM services as a management tool to prevent environmental problems and improved use of natural resources
8	Sustainability as a fundamental requirement in FM services across most client groups
9	Integrating carbon emission reduction as a strategic management tool in FM services
10	Introduction of FM strategies to take advantage on the increasingly governmental use of building regulations to impose environmental standards
11	Development of FM services meeting the requirements of robust operation of facilities due to uncertainties related to climate changes
12	Introduction of FM services comprising assessment and management of health risks and environmental risks of new technologies and materials

Technology	
13	Introduction of FM services for sustainable building technologies and materials robust enough to function in challenging physical environments
14	Widespread use of merged FM services for both aging building stocks and new building systems
15	Introduction of FM services based on BIM (Building Information Modelling)
16	Development of cross disciplinary, life-cycle oriented and holistic FM services for building development, delivery and operation
17	Introduction of FM services based on integrated ICT solutions in intelligent monitoring, configuration and reconfiguration of facilities.
18	Introduction of FM services with specific focus on security to cope with techno-crime threatening internet platforms, ICT, etc.

FM competences	
19	Introduction of a Nordic FM professional network for sharing of knowledge and experiences across industries and application areas
20	Widespread use of knowledge transfer from scientific communities to FM providers and FM clients related to FM services
21	Introduction of a wide range of attractive FM educations in order to counter shortage of FM professionals
22	New operational skills for FM providers and demand for flexible FM services by widespread use of wireless technologies
23	Development of new strategic skills to identify and manage uncertainties and expectations in FM services

Management and new services	
24	Introduction of strategic management balancing the demand for modularisation and standardisation of FM services and at the same time deliver tailor-made FM operations
25	Introduction of agile and proactive FM services for use in management of complex spaces and project portfolios
26	Widespread use and integration of FM services in urban development of former industrial areas
27	Introduction of FM standards and services integrating human resource management
28	Widespread use of PFI/PPP relationships and markets in FM
29	Widespread use of FM services following the investments moving from ownership of corporate real estate to leasing of buy-back deals
30	Introduction of FM services integrating private and public sectors in the provision of community services
31	Introduction of FM services managing facilities across larger physical operating distances and various geographical locales

Value and professionalization of FM	
32	Introduction of a set of principles for measurement and documentation of the added value by FM services
33	Introduction of a methodology to highlight and ascertain return of investment for the organisation of the FM costs spent in-house
34	Introduction of FM services providing strategic value for FM clients with continuously changing functionality, technology and worker/customer demands
35	Introduction of methodology for measurement of performance against service level agreement (SLA)
36	Development of reliable key performance indicators for FM services
37	Development of a common conceptual FM terminology applied within a professional FM management framework
38	Introduction of methodologies for benchmarking of FM services and standards across areas of applications
39	Introduction of methodologies for FM becoming a critical strategic management tool linking the role of facilities to the organisation's core business strategy
40	Introduction of strategic communication tools to make FM services transparent and visible for CEOs

8.3 Formulation of questions

In a Delphi exercise, participants are invited to answer questions about a series of items relating to each statement. These items constitute the variables in a Delphi survey. The questions derive from the objective of the foresight exercise and have to be adapted to them. The questions can be characterised as indicators for evaluation of the significance and importance of the statements, and the statements have to be formulated in a way that the questions can be judged on the basis of them.

Often questions are related to the time on which an event or development occurs. In a strategic perspective it is important in order to understand what time horizon you are talking about.

The following questions have been selected in the Delphi questionnaire:

Period in which the statement will be import for the Nordic FM sector	Short term, 2-5 years
	Long term, 5-15 years
	Never
Importance	Very important
	Important
	Less important
Actions to support development	Academic research
	Industrial R&D
	Teaching
	Public regulation
	Dissemination of knowledge
Actors to promote development	Private clients/in-house FM
	Public clients/in-house FM
	Facility service providers
	Consulting companies
	IT providers
	Construction companies
	Professional networks/associations

8.4 Help text in the Delphi survey

Finally, it is of importance in a Delphi survey to have information about the respondents in order to analyse similarities and differences across interests, expertise and nationality.

Your professional FM interest	Researcher
	Teacher
	Provider
	Client/in-house FM
	Other
Your level of FM expertise	Own field of work
	Knowledgeable
	Unfamiliar
Country	Denmark
	Finland
	Norway
	Sweden
	Other

9. Results of the Delphi Survey

In this chapter the results of the survey are presented. The Delphi scheme and the data from the survey can be found in appendix.

The Delphi was mailed to 117 experts, which had participated in the national workshops and/or in the CFM's Nordic conference 22-23 August 2011. 5 questionnaires did not reach the experts for various reasons. 51 replies were received resulting in an overall response rate of 46%, which was very satisfactory.

9.1 The respondents

27 out of the 51 responders work in Denmark, 8 in Norway, 8 in Sweden, 6 in Finland and 2 in other countries. This might give the results of the survey a bias towards the Danish FM sector. This bias issue will be examined briefly later in the chapter.

The responders were also asked about their professional interests in FM. 25 indicated researchers, 9 client/in-house FM, 5 providers, 2 teachers and 10 indicated other interests.

9.2 Important themes

In **Figure 15** the average response of importance of the themes is depicted. The x-axis contains the six themes within which the 40 statements are distributed. The theme of, for example, 'Technology' contained six statements. The y-axis indicates average percentage within each theme for the question 'Importance for the Development of FM'. Answers from all countries are included.

On this aggregated level only few messages are clear. The theme of 'Management and new services' seems to be the least important in this comparison whereas the theme of 'Resources and sustainability' seems to be slightly the most important.

As mentioned several times there are differences between the viewpoints of the FM sectors in each of the four countries. And as the results of the questionnaire survey might be biased due to an overrepresentation of Danish respondents it is natural to investigate this further. Even though, the number of respondents in the three other countries were low the respondents are all considered as leading FM experts. Therefore, some conclusions might be drawn with great deal of cautiousness.

Figure 16 shows the national differences in what (averaged within each theme) is considered the most important issue, measured as percentages indicating 'very important' in the questionnaire. Only two observable differences can be determined. First the Finnish respondents seems to assess the theme 'Value and professionalization of FM' less important than the other respondents. Second the Swedish respondents seems to consider the theme 'FM competences' less important than the other respondents.

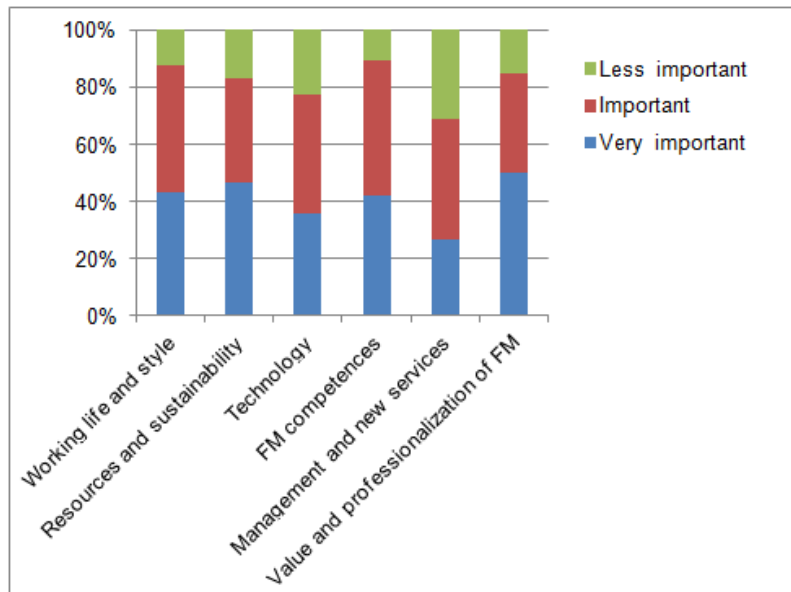


Figure 15: Assessment of the average importance of the six themes. The y-axis indicates average percentage within each theme for the question 'Importance for the Development of FM'. Answers from all countries are included.

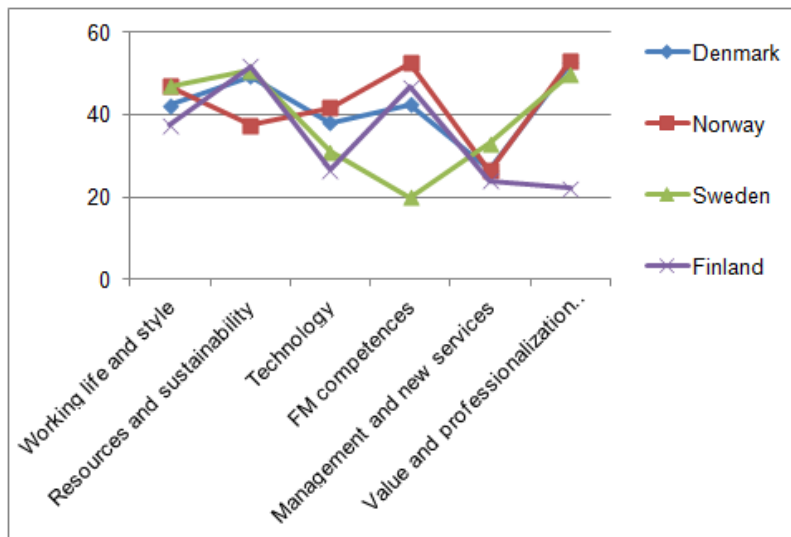


Figure 16: National differences in what is assessed to be the most important themes. The y-axis indicates average percentage within each theme indicating 'Very important' for the question 'Importance for the Development of FM'. This corresponds to the blue bar in the Figure 15 above.

One can also raise the question about differences in viewpoints on importance between academia and practitioners. The study compared answers from at the one hand Researchers and Teachers (academia) and at the other hand all other respondents (mostly practitioners). No observable

differences could be seen except that practitioners assesses the theme ‘Value and professionalization of FM’ as more important than respondents from academia.

9.3 Important issues for academic research

Figure 17 shows the most important activities averaged within each theme. The question was: Most important activities to support the development. Five possibilities were possible: Academic research, Industrial R&D, Teaching, Public regulation, and Dissemination of knowledge. The respondents could select more than one. The y-axis indicates average percentage of respondents ticking of each of the five suggested activities as the most important. Answers from all countries are included.

A few key messages can be drawn from the figure. First academic research is viewed to have an important role for all themes with particular emphasis on the theme of ‘Value and professionalization of FM’ and also within the theme of ‘FM competences’. Industrial R&D is assessed to have its most important role in the theme of Technology. Public regulation is assessed to have a very limited role except within the theme of ‘Resources and sustainability’. The fact that academic research is viewed to have an important role in general is of course a result of a bias, as the statements have been selected and formulated with a research agenda in mind, and not with policy regulation in mind.

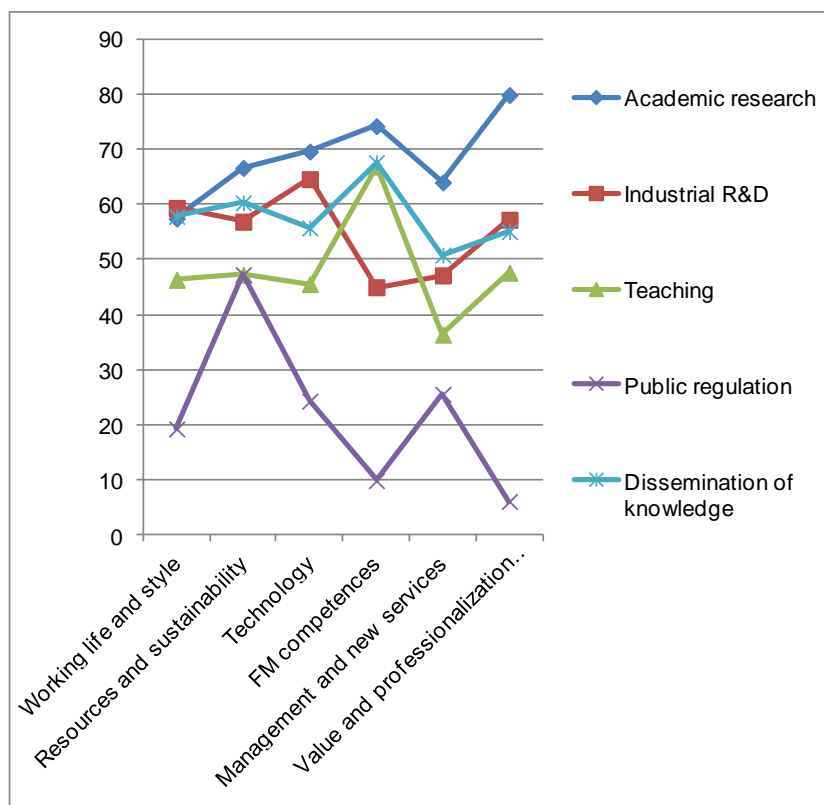


Figure 17: Most important activities averaged within each theme. The y-axis indicates average percentage of respondents ticking of each of the five suggested activities as the most important. Answers from all countries are included.

The survey indicates national differences in the assessment of where academic research is considered to be the most important activity. The most significant observation is that the Finnish respondents for all themes consider industrial R&D to be more important than academic research. In contrast to this the Swedish respondents across all themes consider industrial R&D less important than academic research. Apart from reflecting national differences in the view on FM related research, these observations might also reflect general differences between Sweden and Finland in the perception of research role in society.

No clear differences can be observed on this issue between respondents from academia and practitioners.

9.4 Time horizons

The respondents have been asked about the period in which the statement will be important for the FM sector with three options for answers: Short term (2-5 years), Long term (5-15 years) and Never. For all statements 52% in average indicated short term, and 43 percent indicated long term, and 5 % indicated never. Averaged in each theme shows a similar picture with the theme ‘Value and professionalization of FM’ having a slightly higher ‘short term’ percentage, see **Figure 18**.

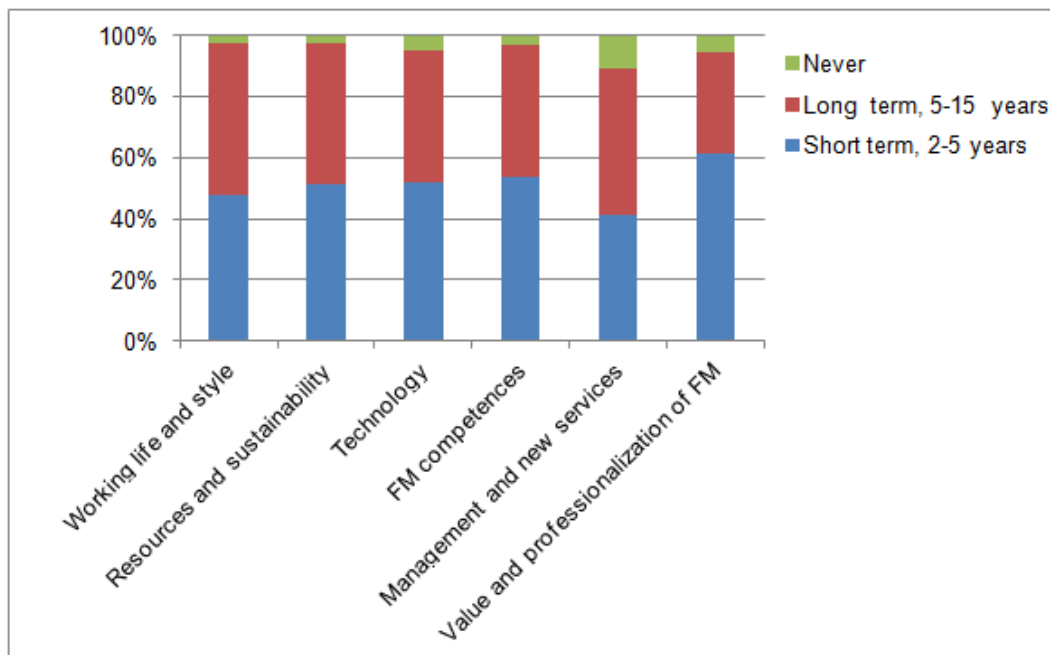


Figure 18: Period in which the statements are assessed to be important for the FM sector averaged within each theme. The y-axis indicates average percentage within each theme for the question ‘Period the statement will be important for FM’. Answers from all countries are included.

The small differences in the distribution of short term and long term issues can be interpreted as a result of the respondents’ view that the issues are important both on short and long term, and that this viewpoint was not an option in the questionnaire.

9.4 Important issues

As one of the objectives of this project was to formulate a common Nordic research strategy, we have ranked individual statements according to a summation of the score in importance and the score in ‘Academic research’ under ‘Most important activities to support the development’, see **Table 5**.

The result further confirms that two themes in particular might be in focus for a Nordic research strategy; namely ‘Value and professionalization of FM’ and ‘Resources and sustainability’. The key issue of statement no. 23 concerns uncertainties and expectations of FM services. We suggest that this issue is closely related to the issue of statement 37 on a common conceptual FM terminology. Statement 20 basically concerns the dissemination of knowledge between academia and practitioners, and we see this as a cross-cutting issue, indeed.

The survey also indicates something about the period in which the Top-10 statements will be important for the FM sector. For the 10 statements in average 55% indicates that the statements are important on short term (2-5 years) where as in average 40% indicates that the statement is important on a longer term (5-15 years). This indicates that the issues of the Top-10 statements by and large have the same urgency as the issues in general.

Table 5: Top 10 list of statement devised from a combination of overall importance and the role of academic research

Rank	Theme	Statement
1	Value and professionalization of FM	39. Introduction of methodologies for FM becoming a critical strategic management tool linking the role of facilities to the organisation's core business strategy
2	Value and professionalization of FM	32. Introduction of a set of principles for measurement and documentation of the added value by FM services
3	Technology	16. Development of cross disciplinary, life-cycle oriented and holistic FM services for building development, delivery and operation
4	Resources and sustainability	8. Sustainability as a fundamental requirement in FM services across most client groups
5	Value and professionalization of FM	33. Introduction of a methodology to highlight and ascertain return of investment for the organisation of the FM costs spent in-house
6	Resources and sustainability	5. Introduction of methodologies for energy saving management in FM services
7	FM competences	23. Development of new strategic skills to identify and manage uncertainties and expectations in FM services
8	FM competences	20. Widespread use of knowledge transfer from scientific communities to FM providers and FM clients related to FM services
9	Value and professionalization of FM	37. Development of a common conceptual FM terminology applied within a professional FM management framework
10	Value and professionalization of FM	34. Introduction of FM services providing strategic value for FM clients with continuously changing functionality, technology and staff/customer demands

9.5 Most important actors

Above we have commented on the role of academic research and industrial R&D. As strategic research carried out by academia often happens in collaboration with industrial partners it is of interest to examine which actors is seen as the most important for promoting the statements.

Figure 19 shows the averaging within each theme. As can be observed from the figure, IT providers and construction companies are assessed to play a less dominant role except in the theme of 'Technology'. As mentioned above statements of the theme of FM competences is on the top 10 list. In particular within this theme FM networks and associations seems is assessed to play a role. Other differences are considered to be insignificant.

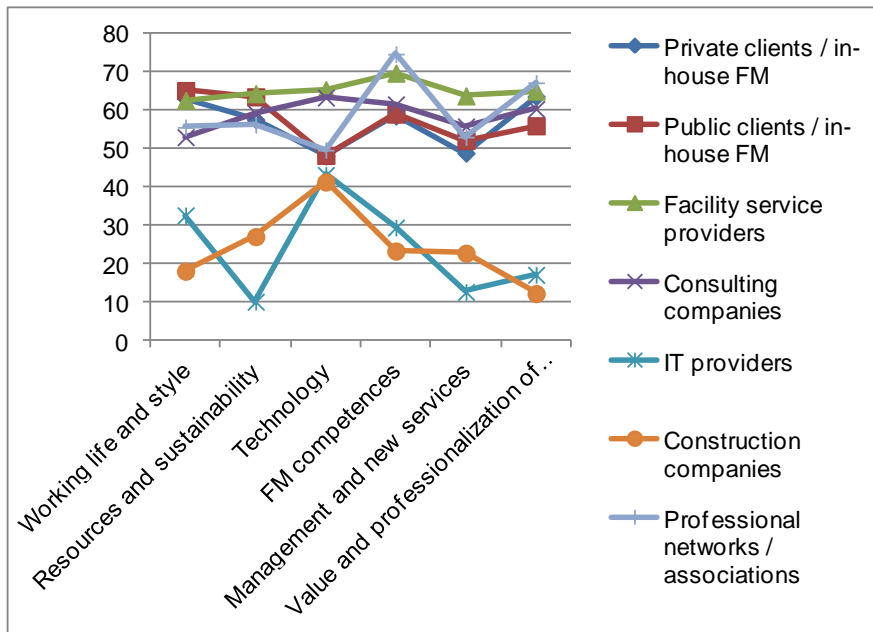


Figure 19: Most important actors averaged within each theme. The y-axis indicates average percentage of ticks within each theme for the question 'Most important actors to promote development'. The respondents could select among seven types of actors as listed in the right side of the figure. The respondents could select more than one type of actor. Answers from all countries are included.

10. Proposal for a Common Nordic Research Agenda

Based on this project a common Nordic research agenda is proposed with two headlines: a) Value and professionalization of FM and b) Sustainability in FM services. Emphasis is set on the former.

Research under the headline of value and professionalization of FM can comprise issues such as: introduction of methodologies for FM becoming a critical strategic management tool linking the role of facilities to the organisation's core business strategy and a set of principles for measurement and documentation of the added value and return of investments of FM services.

Research under the headline of sustainability in facility management services can comprise issues such as: sustainability as a fundamental requirement in FM services across most client groups and methodologies for energy saving management in FM services and.

When a common Nordic research agenda for FM is proposed the national differences must be taking into account. Joint Nordic research must be relevant for all Nordic countries or at least relevant for several countries. The survey indicates some differences between the four Nordic countries. One difference concerns the view on the role of academic research compared to the role of industry R&D. To mitigate this potential area of conflicting interests we suggest that a Nordic FM research agenda include tight cooperation between researchers and industrial partners. Furthermore, transfer of knowledge between researchers and practitioners must be an integral element of a Nordic FM research agenda.

11. Comparisons of the Results with Other Studies

11.1 Introduction

In this section the results of the study will be compared with results of some of the most recent other studies with regards to the general trends and challenges facing the FM sector in the future. The studies published in 2011 by IFMA mainly concerning USA and by ISS with a global outlook are seen as the most relevant in this context. In relation to a research agenda for FM the results from CFM's study will be compared with the results of a recent survey among EuroFM's Research Network Group.

11.2 External megatrends

IFMA's study identified 4 externally-driven trends and ISS's study identified 8 external megatrends, while CFM's study identified a number of different megatrends in the 4 Nordic countries, but two important general trends were determined with 'Sustainability' as the most unambiguous and 'Demographic changes' covering a combination of different trends.

'Sustainability' is the megatrend, which comes most clearly through in all 3 studies. 'Demographic changes' is also a megatrend in ISS's study specified as 'Aging and urbanization', while only the organisationally-driven trend 'Changing work style' in the study from IFMA could be seen as related to 'Demographic changes' and related to the industry specific trend 'New ways of working' in ISS's study.

The megatrends 'Globalisation' and 'Technological development' in ISS's study are also included for some of the Nordic countries in CFM's study, while 'Globalisation' is not mentioned in IFMA's study and 'Technological development' is only addresses as 'Complex building systems'.

The megatrends 'Economic growth', 'The growth of a knowledge society', 'Individualization' and 'Commercialisation' in ISS's study are not significant in CFM's study and not mentioned in IFMA's study. Similarly, the externally driven trend 'Aging building stock' in IFMA's study is neither mentioned in CFM's nor ISS's study. The externally-driven trend 'Emergency preparedness and business continuity' in IFMA's study is not mentioned in CFM's study, but the related trend 'Preparedness and population at risk in densely populated urban areas' is included as an industry specific trend in ISS's study.

11.3 Trends, challenges and needs for new competences and knowledge

IFMA's study identifies 3 internally-driven and 3 organizationally-driven trends, while ISS's study identifies 2 industry specific trends. CFM's study identified a number of different trends and challenges in the short and the long term as well as needs for competence and knowledge for FM professionals.

The industry specific trend 'New ways of working' in ISS's study could as mentioned above be seen as related to the organisationally-driven trend 'Changing work style' in IFMA's study, but in the Nordic countries also Sweden had 'New way of work' as a significant trend and challenge but only in the short time, while the consequences of new ways of working was seen as a significant

need for new competences and knowledge in Norway. The industry specific trend ‘Preparedness and population at risk in densely populated urban areas’ in ISS’s study was as mentioned above related to the externally-driven trend ‘Emergency preparedness and business continuity’ in IFMA’s study, but there were no significant related trends, challenges or need for new competences and knowledge in any of the Nordic countries.

The internally-driven trends ‘Quantity and complexity of data’, ‘Finding top talents’ and ‘Elevate facility management’ in IFMA’s study were not reflected in the trends in ISS’s study, but they could be related particularly to some of the significant needs for new competences and knowledge in CFM’s study. ‘Quantity and complexity of data’ could be related to key performance indicators mentioned in Denmark and Norway. ‘Finding top talent’ and could be related to social ability and personal competences mentioned in Sweden, and ‘Elevate facility management’ could be related to understand clients need and visibility of top management mentioned in Denmark and Sweden, respectively.

The organisationally-driven trends ‘The need of an evolving skill set’ and ‘Efficiency, productivity and profitability’ in IFMA’s study were not reflected in the trends in ISS’s study, but they could be related particularly to some of the significant needs for new competences and knowledge in CFM’s study. As these trends are quite general, this will not be elaborated in any details.

11.4 Research agenda

The studies by IFMA and ISS did not explicitly focus on needs for research, but the results of CFM’s study have clear connections to several of the trends from the other studies.

The two main themes for a research agenda in CFM’s study were ‘Value and professionalization of FM’ and ‘Sustainability in FM services’. ‘Value and professionalization of FM’ has a clear connection to the internally-driven trend ‘Elevate facility management’ in IFMA’s study and is also clearly expressed in the executive summary cited above. There is no clear connection to the trends in ISS’s study, but the topic is clearly reflected in several of the interview comments from industry spokesmen mentioned in the report (ISS, 2011). Sustainability is identified as a megatrend in both IFMA’s and ISS’s study.

Besides the two main themes, the top 10 list of statements of overall importance includes statements on the themes ‘Technology’ and ‘FM competences’. ‘Technology’ is clearly related to the megatrend ‘Technological development’ in ISS’s study and ‘FM competences’ is clearly related to the organisationally-driven trend ‘The need of an evolving skill set’ in IFMA’s study.

The survey among EuroFM’s Research Network Group was conducted in the winter of 2010-11 and covered 16 research institutions which are members of EuroFM. A main result is a prioritised list of 10 European research fields. The three top priorities are ‘Sustainability’, ‘Knowledge’ and ‘Added Value’. This corresponds very well with the main themes for a research agenda in CFM’s study. ‘Sustainability’ is directly related to the theme ‘Sustainability in FM services’, ‘Knowledge’ can be seen related both to ‘Value and professionalization of FM’ and ‘FM competences’, and ‘Added value’ is also strongly related to ‘Value and professionalization of FM’.

11.5 Summing up

The comparison shows that the results of CFM's study in several ways are reflected in the other two FM Futures studies. Sustainability is a clear top priority both as a general megatrend and as a challenge and research need for FM. However, there are also a number of differences in the results, which can be related to differences in the purposes, methods and geographical areas. CFM's study is the only one of studies which shows differentiation between countries.

The research areas identified in CFM's study has a strong relation to the highest prioritised European FM research fields, but CFM's study provides results with much more details and nuances in relation to research needs in the Nordic countries.

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Delphi survey – results

		Importance for the development of FM				Period the statement will be important for the FM sector				Most important activities to support the development (you may select more than one)							Most important actors to promote development (you may select more than one)								
		Very important	Important	Less important	Total	Short term, 2-5 years	Long term, 5-15 years	Never	Total	Academic research	Industrial R&D	Teaching	Public regulation	Dissemination of knowledge	Total responses	Repondents total	Private clients / in-house FM	Public clients / in-house FM	Facility service providers	Consulting companies	IT providers	Construction companies	Professional networks / associations	Total responses	Repondents total
Working life and style																									
1. Introduction of FM services for working environments with a larger number of different work styles	Count	26	22	2	50	27	22	1	50	28	27	24	5	30	114	49	32	35	30	29	13	10	30	179	50
2. Introduction of FM services to support highly mobile work wherever it takes place	Count	17	25	8	50	24	25	1	50	21	30	17	6	26	100	48	28	27	30	24	27	9	25	170	50
3. Provision of FM services integrating new requirements for well-being and ergonomics	Count	17	24	9	50	24	23	2	49	28	23	22	17	25	115	45	31	33	30	26	10	8	29	167	48
4. Introduction of adaptive and flexible FM services meeting the constantly changing work place conditions	Count	26	18	6	50	20	29	1	50	32	33	25	8	29	127	48	34	34	34	26	15	9	26	178	50

		Importance for the development of FM				Period the statement will be important for the FM sector				Most important activities to support the development (you may select more than one)							Most important actors to promote development (you may select more than one)								
		Very important	Important	Less important	Total	Short term, 2-5 years	Long term, 5-15 years	Never	Total	Academic research	Industrial R&D	Teaching	Public regulation	Dissemination of knowledge	Total responses	Repondents total	Private clients / in-house FM	Public clients / in-house FM	Facility service providers	Consulting companies	IT providers	Construction companies	Professional networks / associations	Total responses	Repondents total
Resources and sustainability																									
5. Introduction of methodologies for energy saving management in FM services	Count	36	11	2	49	31	15	0	46	32	37	29	31	29	158	47	31	33	34	33	9	24	27	191	47
6. Provision of FM services meeting the increasing demand of corporate social responsibility (CSR)	Count	17	25	6	48	27	18	0	45	26	21	24	14	30	115	45	32	28	25	26	3	6	26	146	46
7. FM services as a management tool to prevent environmental problems and improved use of natural resources	Count	23	20	5	48	17	28	0	45	32	25	24	23	27	131	45	30	34	35	26	4	10	24	163	47
8. Sustainability as a fundamental requirement in FM services across most client groups	Count	27	17	4	48	23	20	1	44	36	30	30	24	31	151	46	30	32	31	26	5	16	33	173	47
9. Integrating carbon emission reduction as a strategic management tool in FM services	Count	22	12	12	46	20	20	1	41	31	26	14	22	27	120	45	26	32	30	27	4	12	24	155	46
10. Introduction of FM strategies to take advantage of the increasing governmental use of building regulations to impose environmental standards	Count	17	22	9	48	28	11	0	39	21	25	16	22	27	111	45	22	28	27	26	4	14	27	148	46
11. Development of FM services meeting the requirements of robust operation of facilities due to uncertainties related to climate changes	Count	21	12	15	48	14	25	3	42	32	21	17	17	23	110	45	22	26	29	26	4	12	23	142	46
12. Introduction of FM services comprising assessment and management of health risks and environmental risks of new technologies and materials	Count	15	22	11	48	16	21	3	40	32	22	18	19	25	116	45	21	23	28	30	5	7	25	139	46

		Importance for the development of FM				Period the statement will be important for the FM sector				Most important activities to support the development (you may select more than one)							Most important actors to promote development (you may select more than one)								
		Very important	Important	Less important	Total	Short term, 2-5 years	Long term, 5-15 years	Never	Total	Academic research	Industrial R&D	Teaching	Public regulation	Dissemination of knowledge	Total responses	Repondents total	Private clients / in-house FM	Public clients / in-house FM	Facility service providers	Consulting companies	IT providers	Construction companies	Professional networks / associations	Total responses	Repondents total
Technology																									
13. Introduction of FM services for sustainable building technologies and materials robust enough to function in challenging physical environments	Count	16	20	11	47	21	22	2	45	36	31	17	15	22	121	44	23	25	25	27	8	27	22	157	45
14. Widespread use of merged FM services for both aging building stocks and new building systems	Count	12	25	10	47	20	22	3	45	27	23	17	11	24	102	42	22	23	26	27	7	19	21	145	44
15. Introduction of FM services based on BIM (Building Information Modelling)	Count	18	21	8	47	28	15	1	44	34	26	26	8	25	119	43	21	23	32	31	23	24	24	178	45
16. Development of cross disciplinary, life-cycle oriented and holistic FM services for building development, delivery and operation	Count	23	16	5	44	21	19	1	41	35	26	25	9	28	123	42	24	25	32	28	10	20	25	164	42
17. Introduction of FM services based on integrated ICT solutions in intelligent monitoring, configuration and reconfiguration of facilities.	Count	21	15	8	44	23	19	0	42	30	29	21	4	21	105	41	18	16	29	27	31	11	20	152	42
18. Introduction of FM services with specific focus on security to cope with techno-crime threatening internet platforms, ICT, etc.	Count	8	17	20	45	21	15	6	42	14	27	9	14	20	84	39	16	13	24	23	30	7	16	129	39

		Importance for the development of FM				Period the statement will be important for the FM sector				Most important activities to support the development (you may select more than one)						Most important actors to promote development (you may select more than one)									
		Very important	Important	Less important	Total	Short term, 2-5 years	Long term, 5-15 years	Never	Total	Academic research	Industrial R&D	Teaching	Public regulation	Dissemination of knowledge	Total responses	Repondents total	Private clients / in-house FM	Public clients / in-house FM	Facility service providers	Consulting companies	IT providers	Construction companies	Professional networks / associations	Total responses	Repondents total
FM competences																									
19. Introduction of a Nordic FM professional network for sharing of knowledge and experiences across industries and application areas	Count	18	22	3	43	26	14	1	41	30	18	24	3	31	106	40	28	30	30	29	9	12	36	174	41
20. Widespread use of knowledge transfer from scientific communities to FM providers and FM clients related to FM services	Count	19	21	3	43	22	18	1	41	32	18	25	4	30	109	41	27	28	28	27	13	13	32	168	41
21. Introduction of a wide range of attractive FM educations in order to counter shortage of FM professionals	Count	21	18	4	43	22	19	0	41	32	9	40	7	26	114	42	24	25	28	20	10	10	35	152	42
22. New operational skills for FM providers and demand for flexible FM services by widespread use of wireless technologies	Count	19	19	4	42	25	16	1	42	22	29	21	2	27	101	40	20	17	31	24	23	6	22	143	42
23. Development of new strategic skills to identify and manage uncertainties and expectations in FM services	Count	13	21	9	43	16	22	3	41	33	16	25	4	22	100	38	21	21	26	26	6	7	28	135	39

		Importance for the development of FM				Period the statement will be important for the FM sector				Most important activities to support the development (you may select more than one)						Most important actors to promote development (you may select more than one)									
		Very important	Important	Less important	Total	Short term, 2-5 years	Long term, 5-15 years	Never	Total	Academic research	Industrial R&D	Teaching	Public regulation	Dissemination of knowledge	Total responses	Repondents total	Private clients / in-house FM	Public clients / in-house FM	Facility service providers	Consulting companies	IT providers	Construction companies	Professional networks / associations	Total responses	Repondents total
Management and new services																									
24. Introduction of strategic management balancing the demand for modularisation and standardisation of FM services and at the	Count	16	17	8	41	21	15	1	37	25	19	17	3	20	84	36	22	20	31	19	3	3	19	117	36
25. Introduction of agile and proactive FM services for use in management of complex spaces and project portfolios	Count	12	18	10	40	15	18	5	38	27	21	17	1	17	83	36	18	18	25	22	4	6	21	114	35
26. Widespread use and integration of FM services in urban development of former industrial areas	Count	10	14	16	40	10	22	6	38	23	13	14	13	17	80	34	9	14	15	22	3	11	17	91	34
27. Introduction of FM standards and services integrating human resource management	Count	6	19	15	40	12	20	6	38	22	11	15	8	15	71	33	17	16	19	14	2	3	16	87	33
28. Widespread use of PPP relationships and markets in FM	Count	10	16	14	40	19	14	5	38	19	16	11	18	19	83	37	13	24	22	24	5	17	20	125	38
29. Widespread use of FM services following the investments moving from ownership to leasing of real estate	Count	7	16	17	40	18	16	4	38	19	16	6	4	17	62	33	21	13	18	19	3	11	17	102	36
30. Introduction of FM services integrating private and public sectors in the provision of community services	Count	12	18	11	41	15	20	3	38	24	15	11	21	18	89	37	17	29	25	19	4	8	22	124	37
31. Introduction of FM services managing facilities across larger physical operating distances and various geographical locales	Count	14	17	10	41	15	21	3	39	22	23	12	5	21	83	37	23	16	28	21	13	7	20	128	37

		Importance for the development of FM				Period the statement will be important for the FM sector				Most important activities to support the development (you may select more than one)							Most important actors to promote development (you may select more than one)								
		Very important	Important	Less important	Total	Short term, 2-5 years	Long term, 5-15 years	Never	Total	Academic research	Industrial R&D	Teaching	Public regulation	Dissemination of knowledge	Total responses	Repondents total	Private clients / in-house FM	Public clients / in-house FM	Facility service providers	Consulting companies	IT providers	Construction companies	Professional networks / associations	Total responses	Repondents total
Value and professionalization of FM																									
32. Introduction of a set of principles for measurement and documentation of the added value by FM services	Count	22	13	7	42	25	13	3	41	35	20	20	2	23	100	40	24	20	26	24	5	4	27	130	40
33. Introduction of a methodology to highlight and ascertain return of investment for the organisation of the FM costs spent in-house	Count	19	16	6	41	25	11	2	38	33	21	14	0	19	87	40	27	25	21	23	6	4	25	131	40
34. Introduction of FM services providing strategic value for FM clients with continuously changing functionality, technology and staff/customer demands	Count	20	13	6	39	20	18	1	39	29	23	15	0	19	86	37	24	21	28	19	4	5	23	124	38
35. Introduction of methodology for measurement of performance against service level agreement (SLA)	Count	23	14	5	42	30	8	1	39	28	28	19	2	24	101	38	27	24	30	26	10	6	25	148	39
36. Development of reliable key performance indicators for FM services	Count	24	13	5	42	25	11	3	39	27	29	17	1	21	95	38	28	28	26	24	9	4	26	145	40
37. Development of a common conceptual FM terminology applied within a professional FM management framework	Count	17	17	7	41	20	16	2	38	32	19	20	6	24	101	39	16	16	21	23	7	8	33	124	40
38. Introduction of methodologies for benchmarking of FM services and standards across areas of applications	Count	21	11	9	41	20	15	4	39	30	16	18	5	20	89	38	23	20	24	20	7	5	26	125	37
39. Introduction of methodologies for FM becoming a critical strategic management tool linking the role of facilities to the organisation's core business strategy	Count	22	15	4	41	24	15	2	41	32	20	22	3	18	95	36	26	24	24	26	4	4	27	135	37
40. Introduction of strategic communication tools to make FM services transparent and visible for CEOs	Count	18	16	7	41	28	11	2	41	28	20	18	2	21	89	37	26	17	26	25	8	3	22	127	37

Minutes from the four Nordic workshops

Foresight for Facilities Management in Denmark

Documentation from workshop at the Technical University of Denmark

27 October 2010

Introduction

Aim of workshop

The workshop is part of the project 'Foresight on Facilities Management (FM)', which will target the formulation of a Nordic FM strategy on research and education.

The project will include discussions and reflections of research themes and competences for the future of the FM profession by use of structured workshop at national level on three overall themes: i) sector and market, ii) future trends and challenges, and iii) research and education.

The aim of the workshop was:

- to collect experiences and viewpoints from Danish professionals in the field of FM development
- to compare findings across the Nordic countries on FM trends and issues

Participants

12 FM professionals participated in the workshop representing FM clients, FM providers and FM researchers in Denmark.

Facilitators

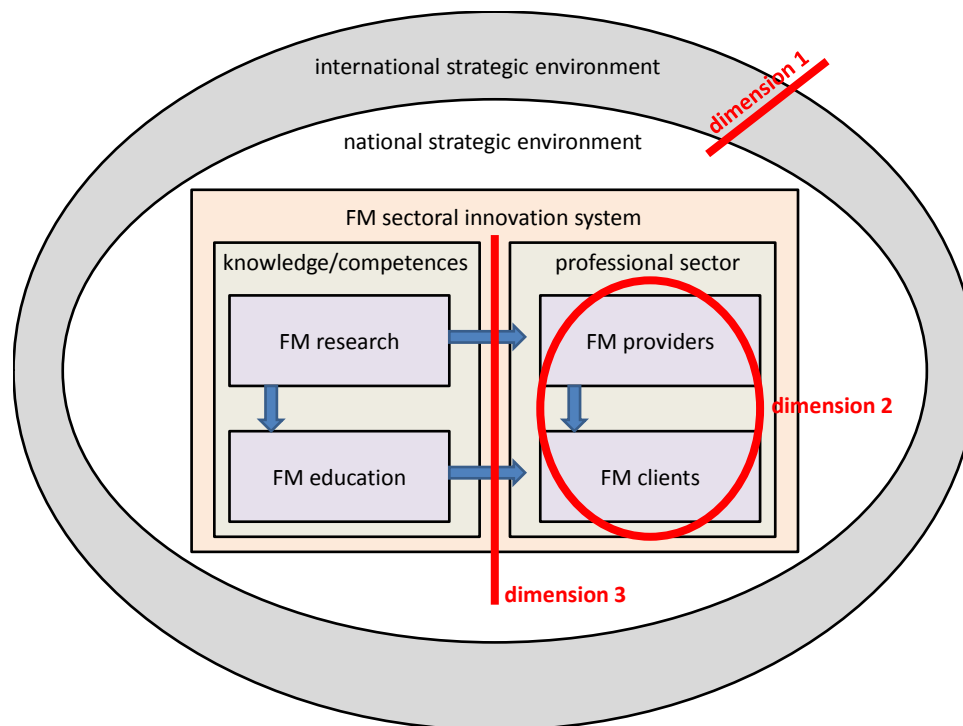
The workshop was facilitated by Head of Section Per Dannemand Andersen and Senior Researcher Birgitte Rasmussen from the 'Innovation Systems and Foresight' section at DTU Management Engineering.

A simple innovation system framework for the FM sector

Several frameworks of the FM innovation system have been developed in order to assist or guide different analytical needs. For our purpose with focus on FM foresight, a simple (sectoral innovation system) framework of the FM sector and its strategic environment is regarded to be a useful tool to guide the analyses and processes, see figure next page.

Generally speaking, the innovation systems approach is a framework embracing a set of powerful concepts such as: relationship, boundary, input, output, environment, feedback, communication, control, and identity. An innovation system can be defined as the '*elements and relationships which interact in the production, diffusion and use of new and economically useful knowledge*' [i]. A sectoral innovation system approach comprises three dimensions: a) knowledge and technological domain, b) actors and networks, and c) institutions [ii].

The FM sector in this understanding consists of a number of providers that provides FM services to their customers or clients. Public FM research and FM educations and courses provide new (research based) knowledge and professionals (graduates) to the sector. The sector and the affiliated research and education institutions exist within a national (e.g. Danish) and international strategic environment.



Framework for FM sectoral innovation system

Dimensions in foresight for Facilities Management

The foresight on facilities management is structured by three overall dimensions reflecting significant conditions and matters for development within the FM sectoral innovation system:

- **Dimension 1: Megatrends in the strategic environment of FM**
 - This dimension deal with megatrends in the strategic environment of the FM sector in Denmark that are going to affect the FM sector within the next two decades.
 - These megatrends can be characterised as external frame conditions and are mostly outside the influence of the actors within the FM sector.
 - We distinguish between the national (i.e. Danish) strategic environment and the international strategic environment. In practices this distinguishing often is difficult.
- **Dimension 2: Current trends and challenges for the FM sector in DK**
 - This dimension deals with trends within the FM sector in Denmark.
 - A trend is in this context defined as an inclination or a tendency that has been observed during the recent few years and that is expected to prevail during the next few (3-5) years.
 - These trends are mostly susceptible to influence by the actors within the FM sector – or results of a strategic or managerial decision taken by FM actors under consideration of developments in the external environment.
- **Dimension 3: Future need for new competences and new knowledge for the FM professionals**
 - This dimension deals with the need for generation of new knowledge and competence building within the FM sector.
 - The job profile and key qualification of FM professionals is of a generalist nature and cross-functional oriented. The profession uses knowledge and tools from a number of other professions and disciplines.
 - The key question for this project is: ‘What should be the curriculum for a formal education in FM? We here understand curriculum as the set of courses, and their content, that should be offered to students of FM at a university level.

Dimension 1: Megatrends in the strategic environment of the FM sector in Denmark

Workshop approach

This part of the workshop was supported by a list of megatrends for the external environment of the FM sector based on results from 'FM Futures workshop in Zürich 2008'. The list was structured by use of the STEP approach grouping the megatrends in four categories: Social, Technology, Economy and Political.

This part of the workshop was structured by the following two leading questions:

- **Question 1:** Which megatrends will impact the FM sector within a time horizon of 10-15 years?
 - In small groups: Discuss and supplement the list of megatrends in the external environment.
 - Each participant: Indicate by use of five 'blue dots' the five megatrends of highest significance for the FM sector in Denmark.
- **Question 2:** Identify the most certain and uncertain megatrends among the selected significant megatrends.
 - Each participant: Indicate by use of five 'green dots' the five most certain megatrends among the selected significant megatrends.
 - Each participant: Indicate by use of five 'red dots' the five most uncertain megatrends among the selected significant megatrends.

STEP	Megatrend in the external environment	Betydning	Usikkerhed
Social	Demographic change – labour shortage	5 blue dots	5 green dots, 5 red dots
	Aging population	2 blue dots	5 green dots, 5 red dots
	Increased mobility	2 blue dots	5 green dots, 5 red dots
	Diversity in society	2 blue dots	5 green dots, 5 red dots
	Migration	2 blue dots	5 green dots, 5 red dots
	Mix of cultures	2 blue dots	5 green dots, 5 red dots
	Change of culture – multi-cultural society	2 blue dots	5 green dots, 5 red dots
Technological	Information and Communication Technology	2 blue dots	5 green dots, 5 red dots
	Knowledge management systems	2 blue dots	5 green dots, 5 red dots
	Intelligent building systems	2 blue dots	5 green dots, 5 red dots
	Faster technological change	2 blue dots	5 green dots, 5 red dots
	Security	2 blue dots	5 green dots, 5 red dots
	Stronger risk management methods	2 blue dots	5 green dots, 5 red dots
Economic (+ market issues)	IKT fylder mindre og mindre, ustabilt/ulstabilit	2 blue dots	5 green dots, 5 red dots
	Globalisation +	5 blue dots	5 green dots, 5 red dots
	Internationalisation – Europeanization	5 blue dots	5 green dots, 5 red dots
	Financial restrictions (budget restrictions)	5 blue dots	5 green dots, 5 red dots
	Increasing cost pressure	5 blue dots	5 green dots, 5 red dots
	Financial restrictions within the health sector	5 blue dots	5 green dots, 5 red dots
	Real estate valuation – opportunity for FM	5 blue dots	5 green dots, 5 red dots
	Competition a new phenomena in health	5 blue dots	5 green dots, 5 red dots
Political (+ legal)	Individualisation of needs	5 blue dots	5 green dots, 5 red dots
	Increasing energy prices	5 blue dots	5 green dots, 5 red dots
	More professional customers	5 blue dots	5 green dots, 5 red dots
	Udflytning af FM virksomhed, FM flytter ned	5 blue dots	5 green dots, 5 red dots

Photo from the workshop showing the poster with megatrends and illustrating the use of blue, green and red dots in relation to the list of megatrends in the strategic environment

Findings and reflections related to dimension 1

STEP category	Megatrends in the strategic environment	significance	certain	uncertain	
Social	Demographic change – labour shortage	5	6	2	Z
	Aging population	2	3	3	Z
	Increased mobility	-	-	-	Z
	Diversity in society	2	-	1	Z
	Migration	-	-	-	Z
	Mix of cultures	5	6	4	Z
	Change of culture – multi-cultural society	-	-	-	Z
	Societal polarization – A-team and B-team	1	1	5	DK
	Language	-	-	-	DK
	Transformation – industry society to knowledge society	2	4	-	DK
	Increased demands for reliability and self-sufficiency	3	2	1	DK
Technological	Information and Communication Technology (ICT)	2	1	-	Z
	Knowledge management systems	-	-	-	Z
	Intelligent building systems	3	4	-	Z
	Faster technological change	1	1	3	Z
	Security	1	-	1	Z
	Stronger risk management methods	-	-	-	Z
	Smaller, flexible and mobile ICT devices	-	-	-	DK
Economic (incl. market issues)	Globalisation	6	6	-	Z
	Internationalisation – Europeanization	3	4	1	Z
	Financial restrictions (budget restrictions)	-	-	-	Z
	Increasing cost pressure	2	1	3	Z
	Financial restrictions within the health sector	-	-	-	Z
	Real estate valuation – opportunity for FM	1	-	1	Z
	Competition as a new phenomena in the health sector	-	-	-	Z
	Individualisation of needs	-	-	-	Z
	Increasing energy prices	-	2	1	Z
	More professional customers	3	3	6	Z
	FM providers move to the markets; FM moves along	-	-	-	DK
	Public-Private Partnerships	1	1	6	DK
	Individualization of FM services	-	-	-	DK
Targeted FM educations	4	6	-	DK	
Political (incl. legal issues)	Increased focus on sustainability	7	9	-	Z
	Consequences of climate changes	1	-	2	Z
	Stronger role of servicing department	2	-	5	Z
	Mix of policies under change	1	-	6	DK
	Change of legislation related to working life.	2	-	4	DK

Results from discussions and prioritizations of megatrends in the strategic environment of the FM sector in Denmark.

Z: megatrends from FM Futures workshop in Zürich 2008.

DK: supplemented megatrends from workshop on Foresight for Facilities Management in Denmark 2010.

The five megatrends of the strategic environment selected as the most significant are:

- **Increased focus on sustainability:** This megatrend has the highest ranking among the workshop participants and is further considered to be a very certain megatrends.
- **Globalisation:** This megatrend is ranked second highest and is among the workshop participants considered to be a rather certain megatrend.
- **Mix of cultures:** This megatrend is ranked as rather significant and it should be noted, that the participants disagreed whether or not this megatrend should be considered to be certain or uncertain.

- Demographic change – labour shortage: This megatrend is ranked as rather significant and the participants did to a large extent agree on pointing at the megatrends as a certain trend.
- Targeted FM educations: This megatrend is ranked fifth highest and is among the workshop participants considered to be a rather certain megatrend.

It is interesting to note that megatrends categorized as technological trends in an overall perspective are ranked rather low compared to megatrends categorized in the three other categories. In the technology category ‘Intelligent building systems’ is to some extent assessed to be significant and considered to be certain.

The considerations and findings related to the megatrends initiated some discussion on FM professionalism among the workshop participants. On the one hand, it was noticed and not expected that the trend ‘More professional customers’ was rated rather low and with a rather high degree of uncertainty. On the other hand, this rating is to some extent contradicted by the high rated trend ‘Targeted FM educations’, which probably will lead to a more professional market and consequently also more professional customers and clients. The viewpoint was presented that increased FM professionalism will be of benefit for providers as well as for customers.

Dimension 2: Current trends and challenges for the FM sector in Denmark

Workshop approach

This part of the workshop was supported by a list of current trends and challenges observed for the FM sector [iii]:

1. Outsourcing.
2. From single service towards multi-service and integrated facilities.
3. From operational towards strategic focus.
4. From cost reduction towards added value before the financial crisis.
5. New forms of procurement - partnership based collaboration.
6. ICT development => changing needs for support of workplaces and infrastructure and for internal process development in the FM supply chain.
7. Increased focus on sustainability and corporate social responsibility creates new FM activities and opportunities.
8. Increased cross-border coordination of FM in multinational companies and use of international service providers.
9. Increasing need for educations on all levels as well as R&D.
10. Pressure for decreasing FM costs per workplace.

This part of the workshop was structured by the following two leading questions:

- Question 1: What keeps a professional FM awake at night right now?
 - In small groups: Discuss and supplement the list of current trends and challenges for the FM sector in Denmark. Write a PostIt note for each trend/challenge.
 - In plenum: Clustering of trends and challenges.
- Question 2: Identify the most significant trends and challenges in short term and long term.
 - Each participant: Indicate by use of five ‘blue dots’ the five most significant trends or challenges in a short term perspective.
 - Each participant: Indicate by use of five ‘yellow dots’ the five most significant trends or challenges in a long term perspective.

Findings and reflections related to dimension 2

Cluster	Topic	Significance	
		short term	long term
Market development	From multiservice to integrated service. The end user receives all-inclusive contracts.	4	1
	From single service to multiservice.	1	1
	Increased cross-border coordination of FM in multinational companies. Multinational FM actors demand multinational FM providers	2	4
	Service providers: multiservice, professionalism, 'more standardization', SLA (service level agreement), etc.	2	-
	Increasing customization of service due to pressure from employees/departments	1	-
Market structure	Many new actors in the field: i) mature of the market, ii) increased competition, iii) from 'small' companies to 'big' which extends the assortment, iv) harder to overview the market	4	1
	FM in new areas, e.g. public service: care, hospitals, childcare.	2	4
	Moving to new market – contractor taking responsibility for operations (5-30 years)	2	2
	New business models: e.g. ESCO, OPS	2	4
	From internal (zero error culture) to EU contracts and uncertainty management	5	1
Economy	Focus on price efficiency (cost reduction) – not on added value	5	-
	Value added (employee benefits) for clients + cost optimization. Finding the right balance.	1	3
	Cost optimization. Requirement: more (better quality) for less money. Additional purchase → extend the field of business (service providers)	3	3
	Unstable estate markets – realization of surplus estates	3	3
Education	General agreement on need for more education on all levels, but: low participation in new courses. Need for education in sustainability	1	7
ICT	ICT – widespread application in SME is a challenge and risk due to large investments and reorganisations also in service companies	3	1
	ICT – new tools to fewer employees, i.e. more flexibility and documentation on the spot	-	4
	Benchmarking. Structures. Standards.	1	6
Sustainability	Sustainability: energy, environment, branding	5	8
	Politically correct answer: sustainability. But it does not steal sleep. Which mechanisms and incitements drive the development? Who are the front runners?	-	-
In house – outsourcing	Uncertainty what concerns in house/outsourcing. <ul style="list-style-type: none"> • contestability • uncertainty among employees lead to requirements on communication and dissemination 	2	-
	Occupational structure and pressure from trade unions	2	1
	Elucidation of the FM costs used in-house (especially in politically-led organizations)	4	1



Photo from the workshop illustrating the use of PostIt notes and dots to cluster and priority setting of current trends and challenges for the FM sector in Denmark

The six current trends and challenges assessed to be most significant in a short time perspective are:

- Sustainability: energy, environment, branding.
- Focus on price efficiency (cost reduction) – not on added value.
- From internal (zero error culture) to EU contracts and uncertainty management.
- Elucidation of the FM costs used in-house (especially in politically-led organizations).
- Many new actors in the field: i) mature of the market, ii) increased competition, iii) from 'small' companies to 'big' which extends the assortment, iv) harder to overview the market.
- From multiservice to integrated service. The end user receives all-inclusive contracts.

The three current trends and challenges assessed to be most significant in a long time perspective are:

- Sustainability: energy, environment, branding.
- General agreement on need for more education on all levels, but: low participation in new courses.
- Benchmarking. Structures. Standards.

The clustering and priority setting of current trends and challenges gave rise to some further input and reflections among the workshop participants. From an employee perspective outsourcing of FM services is a source to uncertainty what concerns job security. The possibility that the employer and the conditions for employment can change quickly due to outsourcing puts emphasis and continuously awareness on new requirements to competences and flexibility. Further, the trade unions will be challenged when the conditions for work and employer relations are changed for some of their member groups probably leading to members shifting from one trade union to another. Another aspect related to outsourcing of FM services is the management challenges related to new collaborative cultures and relations across institutions that may be the consequence of moving FM services from an in-house function to service from an external FM provider.

The viewpoint was presented that sustainability is not only political correct, the demand is also stated by FM clients. In that context it is important to develop some common ground rules on how to manage aspects and conditions related to sustainability. We can see that economical rationales are coming up and that economic rationales compete with rationales related to sustainability in FM strategies and decisions.

Finally it was stressed that benchmarking will be an important issue in the future. It is of high importance for FM clients to be able to elucidate and compare costs within the field of facilities management.

Dimension 3: Future need for new competences and new knowledge for the FM professionals

Workshop approach

This part of the workshop was supported by a list of FM competences suggested by EuroFM [iii] structured by use of the following headlines: Managing services; Managing the work environment; Managing resources; Understanding business organization; Managing people and Managing premises.

This part of the workshop was structured by the following two leading questions:

- **Question 1:** *Which needs does the FM sector have for new knowledge and new competences?*
 - In small groups: Discuss the needs for new knowledge and new competences.
 - In plenum: Presenting and writing on flip-over the results of group discussions.
- **Question 2:** *Identify the most significant needs for new knowledge and new competences.*
 - Each participant: Indicate by use of five ‘blue dots’ the five most significant needs for new knowledge and competences.

Findings and reflections related to dimension 3

Needs for new knowledge and competences	Significance
New ICT educations and trainings (especially software)	2
Ability to keep and attract qualified and professional employees	3
Waste management – recycling	2
Communication with marketing departments	-
Regulation and control of energy systems – education	1
Specialized cleaning skills and competences (e.g. swimming pools, aeroplanes)	-
Project + personal management	-
Strategic: more consciousness about FM at director level	1
Operational: employees, change of working culture, multi functions and focus on results	3
Tactic: keep up the good work	-
Use of existing knowledge from other management disciplines	3
Apply and maintain existing knowledge – systematic collection of lessons learned	2
Attitude to service, education	1
Intelligent use of key figures	6
Qualify people to make the right choices	5
Understand client needs, especially in development departments, transfer the understanding to the operational level	10
Integration of data	1
BIM – Building Information Modelling	2
Management of aesthetics and politics	-
Understand the organisation of companies and their FM strategies	7
Portfolio + space management	6
Sustainability	5

The four most significant needs for new knowledge and competences are:

- Understand client needs, especially in development departments, transfer the understanding to the operational level
- Understand the organisation of companies and their FM strategies
- Portfolio + space management
- Intelligent use of key figures

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- [i] B.-Å. Lundvall (Ed.), *National Systems of Innovation - Towards a Theory of Innovation and Interactive Learning*, London, Pinter Publishers, 1992.
- [ii] F. Malerba, *Sectoral Systems: How and Why Innovation Differs across Sectors*. In: Fagerberg, J., Mowery, D. C.; Nelson R. R., *The Oxford Handbook of Innovation*, Oxford University Press, 2005.
- [iii] P.A. Jensen; P. Dannemand Andersen, *The FM Sector and its Status in the Nordic Countries*, *Center for Facilities Management*, Technical University of Denmark, October 2010.

Foresight for Facilities Management in Norway

Documentation from workshop at NHO Service in Oslo

5 November 2010

Introduction

Aim of workshop

The workshop is part of the project 'Foresight on Facilities Management (FM)', which will target the formulation of a Nordic FM strategy on research and education.

The project will include discussions and reflections of research themes and competences for the future of the FM profession by use of structured workshop at national level on three overall themes: i) sector and market, ii) future trends and challenges, and iii) research and education.

The aim of the workshop was:

- to collect experiences and viewpoints from Norwegian professionals in the field of FM development
- to compare findings across the Nordic countries on FM trends and issues

Participants

7 FM professionals participated in the workshop representing FM clients, FM providers and FM education in Norway.

Facilitators

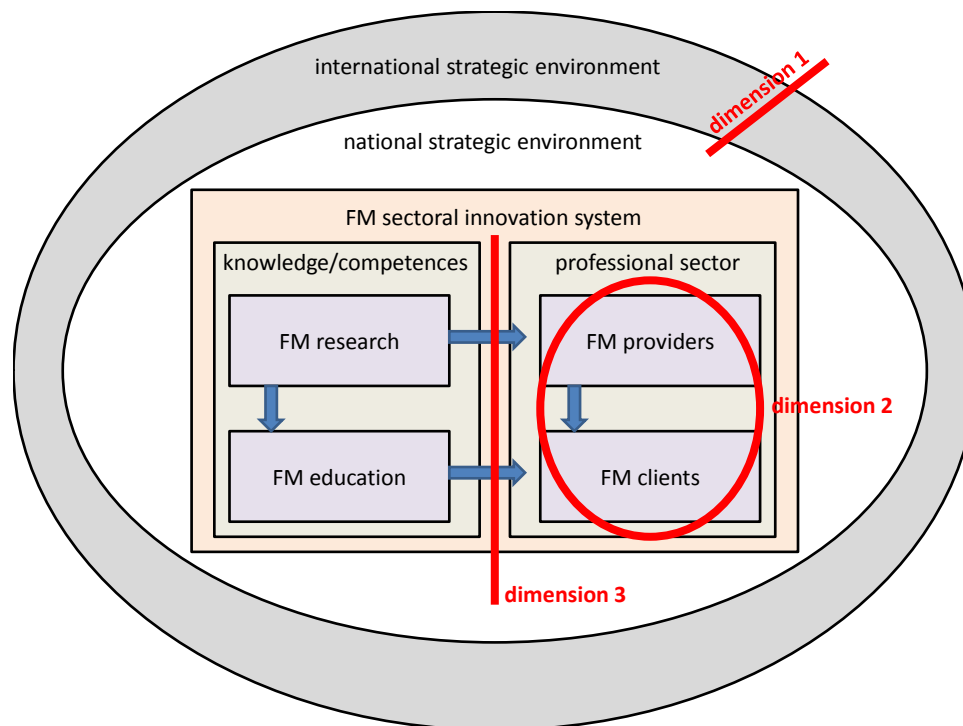
The workshop was facilitated by Head of Section Per Dannemand Andersen and Senior Researcher Birgitte Rasmussen from the 'Innovation Systems and Foresight' section at DTU Management Engineering.

A simple innovation system framework for the FM sector

Several frameworks of the FM innovation system have been developed in order to assist or guide different analytical needs. For our purpose with focus on FM foresight, a simple (sectoral innovation system) framework of the FM sector and its strategic environment is regarded to be a useful tool to guide the analyses and processes, see figure next page.

Generally speaking, the innovation systems approach is a framework embracing a set of powerful concepts such as: relationship, boundary, input, output, environment, feedback, communication, control, and identity. An innovation system can be defined as the '*elements and relationships which interact in the production, diffusion and use of new and economically useful knowledge*' [i]. A sectoral innovation system approach comprises three dimensions: a) knowledge and technological domain, b) actors and networks, and c) institutions [ii].

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Framework for FM sectoral innovation system

Dimensions in foresight for Facilities Management

The foresight on facilities management is structured by three overall dimensions reflecting significant conditions and matters for development within the FM sectoral innovation system:

- **Dimension 1:** *Megatrends in the strategic environment of FM*
 - This dimension deal with megatrends in the strategic environment of the FM sector in Norway that are going to affect the FM sector within the next two decades.
 - These megatrends can be characterised as external frame conditions and are mostly outside the influence of the actors within the FM sector.
 - We distinguish between the national (i.e. Norwegian) strategic environment and the international strategic environment. In practices this distinguishing often is difficult.
- **Dimension 2:** *Current trends and challenges for the FM sector in Norway*
 - This dimension deals with trends within the FM sector in Norway
 - A trend is in this context defined as an inclination or a tendency that has been observed during the recent few years and that is expected to prevail during the next few (3-5) years.
 - These trends are mostly susceptible to influence by the actors within the FM sector – or results of a strategic or managerial decision taken by FM actors under consideration of developments in the external environment.
- **Dimension 3:** *Future need for new competences and new knowledge for the FM professionals*
 - This dimension deals with the need for generation of new knowledge and competence building within the FM sector.
 - The job profile and key qualification of FM professionals is of a generalist nature and cross-functional oriented. The profession uses knowledge and tools from a number of other professions and disciplines.
 - The key question for this project is: ‘What should be the curriculum for a formal education in FM? We here understand curriculum as the set of courses, and their content, that should be offered to students of FM at a university level.

Dimension 1: Megatrends in the strategic environment of the FM sector in Norway

Workshop approach

This part of the workshop was supported by a list of megatrends for the external environment of the FM sector based on results from 'FM Futures workshop in Zürich 2008'. The list was structured by use of the STEP approach grouping the megatrends in four categories: Social, Technology, Economy and Political.

This part of the workshop was structured by the following two leading questions:

- **Question 1:** Which megatrends will impact the FM sector within a time horizon of 10-15 years?
 - In small groups: Discuss and supplement the list of megatrends in the external environment.
 - Each participant: Indicate by use of five 'blue dots' the five megatrends of highest significance for the FM sector in Norway.
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 - Each participant: Indicate by use of five 'green dots' the five most certain megatrends among the selected significant megatrends.
 - Each participant: Indicate by use of five 'red dots' the five most uncertain megatrends among the selected significant megatrends.

STEP	Megatrend in the external environment	Betydning	Usikkerhet
Social	Demographic change – labour shortage	5	5
	Aging population	1	2
	Increased mobility		
	Diversity in society		
	Migration		
	Mix of cultures		
	Change of culture – multi-cultural society		
	<i>Centralisering - storbyer</i>		
Technological	Information and Communication Technology	5	5
	Knowledge management systems	2	5
	Intelligent building systems		
	Faster technological change	2	5
	Security		
	Stronger risk management methods		
	<i>Bedt automatisering</i>		
Economic (+ market issues)	Globalisation		
	Internationalisation – Europeanization	2	5
	Financial restrictions (budget restrictions)		5
	Increasing cost pressure	5	5
	Financial restrictions within the health sector		
	Real estate valuation – opportunity for FM		
	Competition a new phenomena in health	2	5
Political (+ legal)	Individualisation of needs		
	Increasing energy prices		5
	More professional customers	1	5
	Increased focus on sustainability	5	5
	Consequences of climate changes		
	Stronger role of servicing department		

Photo from the workshop showing the poster with megatrends and illustrating the use of blue, green and red dots in relation to the list of megatrends in the strategic environment

Findings and reflections related to dimension 1

STEP category	Megatrends in the strategic environment	significance	certain	uncertain	
Social	Demographic change – labour shortage	6	7	-	Z
	Aging population	-	-	-	Z
	Increased mobility	-	-	-	Z
	Diversity in society	-	-	-	Z
	Migration	-	-	-	Z
	Mix of cultures	-	-	-	Z
	Change of culture – multi-cultural society	-	-	-	Z
	Centralization – large scale operations	-	-	-	NO
	Greater demands on social responsibility (CSR)	1	-	6	NO
	Cooperation between municipalities – larger units	-	-	-	NO
	The quality concept of FM gains higher importance	-	-	-	NO
	Increased flexibility – wider spectrum of jobs	-	-	-	NO
	Minor class barriers in the working life	-	-	-	NO
	New ways working (workplaces)	2	1	5	NO
	New demands from employees	-	-	-	NO
Management of core competences	-	-	-	NO	
Technological	Information and Communication Technology (ICT)	5	4	-	Z
	Knowledge management systems	2	1	3	Z
	Intelligent building systems	-	-	-	Z
	Faster technological change	2	1	3	Z
	Security	-	-	-	Z
	Stronger risk management methods	-	-	-	Z
	Increased automation	-	-	-	NO
Economic (incl. market issues)	Globalisation	-	-	-	Z
	Internationalisation – Europeanization	2	1	5	Z
	Financial restrictions (budget restrictions)	-	1	4	Z
	Increasing cost pressure	5	5	-	Z
	Financial restrictions within the health sector	-	-	-	Z
	Real estate valuation – opportunity for FM	-	-	-	Z
	Competition as a new phenomena in the health sector	2	1	5	Z
	Individualisation of needs	-	-	-	Z
	Increasing energy prices	-	-	-	Z
	More professional customers	1	4	2	Z
Political (incl. legal issues)	Increased focus on sustainability	5	4	2	Z
	Consequences of climate changes	-	-	-	Z
	Stronger role of servicing department	-	-	-	Z
	Stricter demands on environmental responsibility	2	5	-	NO

Results from discussions and prioritizations of megatrends in the strategic environment of the FM sector in Norway.

Z: megatrends from FM Futures workshop in Zürich 2008.

NO: supplemented megatrends from workshop on Foresight for Facilities Management in Norway 2010.

The four megatrends of the strategic environment selected as the most significant are:

- **Demographic change – labour shortage:** This megatrend has the highest ranking among the workshop participants and is further considered to be a very certain megatrends.

- Information and Communication Technology (ICT): This megatrend is ranked rather high and is among the workshop participants considered to be a rather certain megatrend.
- Increasing cost pressure: This megatrend is ranked rather high and is among the workshop participants considered to be a rather certain megatrend.
- Increased focus on sustainability: This megatrend is ranked as rather significant and it should be noted, that the participants disagreed whether or not this megatrend should be considered to be certain or uncertain.

The exercise on megatrends in the strategic environment of the FM sector in Norway gave rise to questions about the number of FM providers in Norway and their size and importance on the market.

Further, it was remarked, that due to Norway not being a member of EU, it is not surprisingly for the participants that the megatrend 'Internationalisation – Europeanization' is assessed to be of a rather high uncertainty.

Dimension 2: Current trends and challenges for the FM sector in Norway

Workshop approach

This part of the workshop was supported by a list of current trends and challenges observed for the FM sector [iii]:

1. Outsourcing.
2. From single service towards multi-service and integrated facilities.
3. From operational towards strategic focus.
4. From cost reduction towards added value before the financial crisis.
5. New forms of procurement - partnership based collaboration.
6. ICT development => changing needs for support of workplaces and infrastructure and for internal process development in the FM supply chain.
7. Increased focus on sustainability and corporate social responsibility creates new FM activities and opportunities.
8. Increased cross-border coordination of FM in multinational companies and use of international service providers.
9. Increasing need for educations on all levels as well as R&D.
10. Pressure for decreasing FM costs per workplace.

This part of the workshop was structured by the following two leading questions:

- Question 1: What keeps a professional FM awake at night right now?
 - In small groups: Discuss and supplement the list of current trends and challenges for the FM sector in Norway. Write a PostIt note for each trend/challenge.
 - In plenum: Clustering of trends and challenges.
- Question 2: Identify the most significant trends and challenges in short term and long term.
 - Each participant: Indicate by use of five 'blue dots' the five most significant trends or challenges in a short term perspective.
 - Each participant: Indicate by use of five 'yellow dots' the five most significant trends or challenges in a long term perspective.

Findings and reflections related to dimension 2

Cluster	Topic	Significance	
		short term	long term
Market development	Customers move from Total FM deliveries to singly service delivery (often because they were premature or because they were not sufficient prepared)	-	-
	More companies will develop long-term FM strategies – but reluctant to take the first step	4	1
	Too few Total FM enquiries in the market	3	-
	Shared service merges with FM services	-	5
	Expectation management	-	5
Purchase / partnerships	Holistic understanding of value chain and clients needs - added value - new forms of procurement	-	5
	Much control of purchasing	-	-
	Increased use of external consultants in procurement processes	2	-
	Poor knowledge about FM costs makes it difficult to feel secure what concerns outsourcing of FM services and to document the realization of savings	2	-
	Lack of competences - clients / purchaser - provider	3	1
	Immaturity of customers - too much focus at the operational level - not professional clients!	5	-
Politics Frame conditions	Focus on sustainability	-	5
	Sustainability		
	Multi service		
	FM is not clearly defined Spread out a common FM terminology	7	-
	Political development	1	6

The three current trends and challenges assessed to be most significant in a short time perspective are:

- FM is not clearly defined. Spread out a common terminology.
- Immaturity of customers. Too much focus at the operational level. Not professional clients!
- More companies will develop long-term FM strategies – but reluctant to take the first step.

The five current trends and challenges assessed to be most significant in a long time perspective are:

- Political development
- Focus on sustainability
- Holistic understanding of value chain and clients needs (added value and new forms of procurement)
- Expectation management
- Shared service merges with FM services

The clustering and priority setting of current trends and challenges gave rise to some further input and reflections among the workshop participants. The political development in Norway will have a high influence on the development and function of the public sector and consequently on its use of FM services. Further, an important future field will be expectation management and the FM sector will benefit of finding

its role and function within this new emerging field. Finally, it is of importance for the FM sector to provide and obtain a better understanding of the different customer industries in Norway.

Dimension 3: Future need for new competences and new knowledge for the FM professionals

Workshop approach

This part of the workshop was supported by a list of FM competences suggested by EuroFM [iii] structured by use of the following headlines: Managing services; Managing the work environment; Managing resources; Understanding business organization; Managing people and Managing premises.

This part of the workshop was structured by the following two leading questions:

- **Question 1:** *Which needs does the FM sector have for new knowledge and new competences?*
 - In small groups: Discuss the needs for new knowledge and new competences.
 - In plenum: Presenting and writing on flip-over the results of group discussions.
- **Question 2:** *Identify the most significant needs for new knowledge and new competences.*
 - Each participant: Indicate by use of five ‘blue dots’ the five most significant needs for new knowledge and competences.

Findings and reflections related to dimension 3

Needs for new knowledge and competences	Significance
Competence in purchasing – managing two roles: - clarification and grounding of internal needs - purchase and contract with provider	5
The responsibility of the FM provider	-
Service as a function	2
Service as a standard	-
Service as customer treatment	-
KPI (key performance indicators)	6
Development of reliable key figures	5
Allocation of costs	1
Process understanding and tools	5
Systems solutions	4
New ways of working, consequences for FM	6

The five most significant needs for new knowledge and competences are:

- New ways of working, consequences for FM
- KPI (key performance indicators)
- Process understanding and tools
- Development of reliable key figures
- Competence in purchasing – managing two roles: i) clarification and grounding of internal needs, and ii) purchase and contract with provider

The question was raised, if the education was focused solely on teaching of FM managers. It was discussed and stressed that education as well as research will be at strategic, tactical and operational level. Further, educational programs will also comprise education at bachelor level.

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- [i] B.-Å. Lundvall (Ed.), *National Systems of Innovation - Towards a Theory of Innovation and Interactive Learning*, London, Pinter Publishers, 1992.
 - [ii] F. Malerba, *Sectoral Systems: How and Why Innovation Differs across Sectors*. In: Fagerberg, J., Mowery, D. C.; Nelson R. R., *The Oxford Handbook of Innovation*, Oxford University Press, 2005.
 - [iii] P.A. Jensen; P. Dannemand Andersen, *The FM Sector and its Status in the Nordic Countries*, Center for Facilities Management, Technical University of Denmark, October 2010.

Foresight for Facilities Management in Sweden

Documentation from workshop at DN-Skrapan in Stockholm

15 March 2011

Introduction

Aim of workshop

The workshop is part of the project 'Foresight on Facilities Management (FM)', which will target the formulation of a Nordic FM strategy on research and education.

The project will include discussions and reflections of research themes and competences for the future of the FM profession by use of structured workshop at national level on three overall themes: i) sector and market, ii) future trends and challenges, and iii) research and education.

The aim of the workshop was:

- to collect experiences and viewpoints from Swedish professionals in the field of FM development
- to compare findings across the Nordic countries on FM trends and issues

Participants

13 FM professionals participated in the workshop representing FM clients, FM providers and FM education in Sweden.

Facilitators

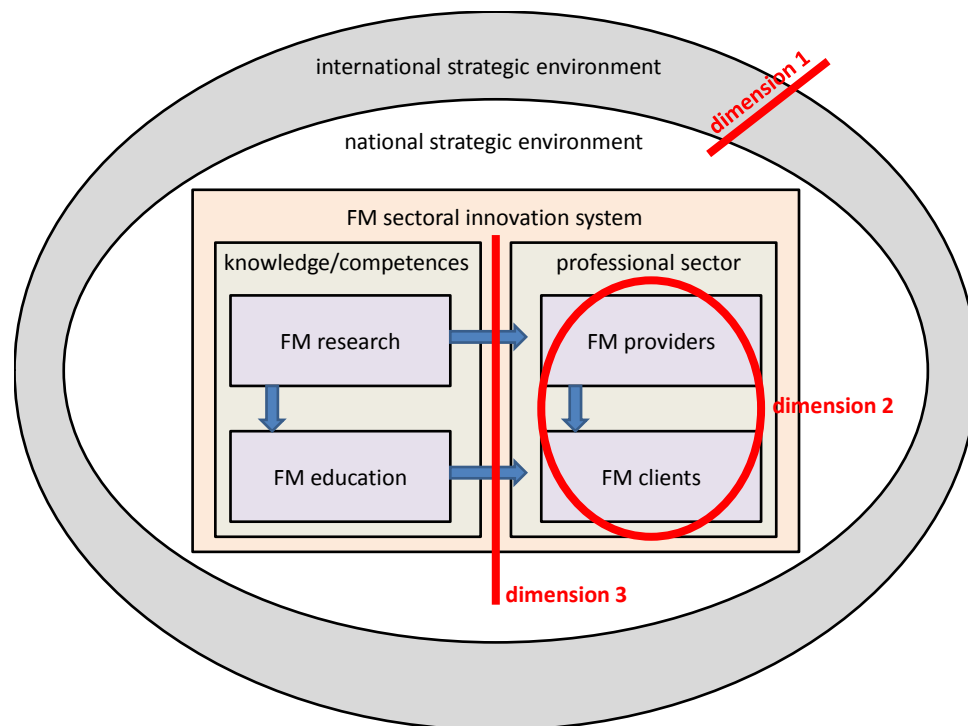
The workshop was facilitated by Head of Section Per Dannemand Andersen and Senior Researcher Birgitte Rasmussen from the 'Innovation Systems and Foresight' section at DTU Management Engineering.

A simple innovation system framework for the FM sector

Several frameworks of the FM innovation system have been developed in order to assist or guide different analytical needs. For our purpose with focus on FM foresight, a simple (sectoral innovation system) framework of the FM sector and its strategic environment is regarded to be a useful tool to guide the analyses and processes, see figure next page.

Generally speaking, the innovation systems approach is a framework embracing a set of powerful concepts such as: relationship, boundary, input, output, environment, feedback, communication, control, and identity. An innovation system can be defined as the '*elements and relationships which interact in the production, diffusion and use of new and economically useful knowledge*' [i]. A sectoral innovation system approach comprises three dimensions: a) knowledge and technological domain, b) actors and networks, and c) institutions [ii].

The FM sector in this understanding consists of a number of providers that provides FM services to their customers or clients. Public FM research and FM educations and courses provide new (research based) knowledge and professionals (graduates) to the sector. The sector and the affiliated research and education institutions exist within a national (e.g. Swedish) and international strategic environment.



Framework for FM sectoral innovation system

Dimensions in foresight for Facilities Management

The foresight on facilities management is structured by three overall dimensions reflecting significant conditions and matters for development within the FM sectoral innovation system:

- **Dimension 1:** *Megatrends in the strategic environment of FM*
 - This dimension deal with megatrends in the strategic environment of the FM sector in Sweden that are going to affect the FM sector within the next two decades.
 - These megatrends can be characterised as external frame conditions and are mostly outside the influence of the actors within the FM sector.
 - We distinguish between the national (i.e. Swedish) strategic environment and the international strategic environment. In practices this distinguishing often is difficult.
- **Dimension 2:** *Current trends and challenges for the FM sector in Sweden*
 - This dimension deals with trends within the FM sector in Sweden
 - A trend is in this context defined as an inclination or a tendency that has been observed during the recent few years and that is expected to prevail during the next few (3-5) years.
 - These trends are mostly susceptible to influence by the actors within the FM sector – or results of a strategic or managerial decision taken by FM actors under consideration of developments in the external environment.
- **Dimension 3:** *Future need for new competences and new knowledge for the FM professionals*
 - This dimension deals with the need for generation of new knowledge and competence building within the FM sector.
 - The job profile and key qualification of FM professionals is of a generalist nature and cross-functional oriented. The profession uses knowledge and tools from a number of other professions and disciplines.
 - The key question for this project is: ‘What should be the curriculum for a formal education in FM? We here understand curriculum as the set of courses, and their content, that should be offered to students of FM at a university level.

Dimension 1: Megatrends in the strategic environment of the FM sector in Sweden

Workshop approach

This part of the workshop was supported by a list of megatrends for the external environment of the FM sector based on results from 'FM Futures workshop in Zürich 2008'. The list was structured by use of the STEP approach grouping the megatrends in four categories: Social, Technology, Economy and Political.

This part of the workshop was structured by the following two leading questions:

- **Question 1:** Which megatrends will impact the FM sector within a time horizon of 10-15 years?
 - In small groups: Discuss and supplement the list of megatrends in the external environment.
 - Each participant: Indicate by use of five 'blue dots' the five megatrends of highest significance for the FM sector in Sweden.
- **Question 2:** Identify the most certain and uncertain megatrends among the selected significant megatrends.
 - Each participant: Indicate by use of five 'green dots' the five most certain megatrends among the selected significant megatrends.
 - Each participant: Indicate by use of five 'red dots' the five most uncertain megatrends among the selected significant megatrends.

DTU Management Engineering
 Department of Management Engineering
 Megatrends in the external environment
 Based on results from FM Futures workshop in Zürich 2008
 Stockholm 15/3-11

STEP	Megatrend in the external environment	Impact	Uncertainty
Social	Demographic change – labour shortage		
	Aging population		
	Increased mobility		
	Diversity in society		
	Migration		•••••
	Mix of cultures	••	•••••
	Change of culture – multi-cultural society	••	•••••
Technological	Projektbaserad arbete – new ways of work	•••••	•••••
	Women's role in working life	•	•••••
	Information and Communication Technology	•••••	•••••
	Knowledge management systems	••	•••••
	Intelligent building systems	••	•••••
	Faster technological change	•••••	•••••
	Security	•••••	•••••
Economic (+ market issues)	Stronger risk management methods	•	•••••
	New generations – new demands (facebook)		•••••
	Higher education level in society		•••••
	Globalisation	•••••	•••••
	Internationalisation – Europeanization	••	•••••
	Financial restrictions (budget restrictions)		•••••
	Increasing cost pressure		•••••
Political (+ legal)	Financial restrictions within the health sector		•••••
	Real estate valuation – opportunity for FM		•••••
	Competition a new phenomena in health		•••••
	Individualisation of needs		•••••
	Increasing energy prices	•	•••••
	More professional customers		•••••
	Natural disasters		•••••
Simplified legislation		•••••	
Political (+ legal)	Increased focus on sustainability	••	•••••
	Consequences of climate changes	•••••	•••••
	Stronger role of servicing department	•	••
	Changed values/ethics	•	••

Photo from the workshop showing the poster with megatrends and illustrating the use of blue, green and red dots in relation to the list of megatrends in the strategic environment

Findings and reflections related to dimension 1

STEP category	Megatrends in the strategic environment	significance	certain	uncertain	
Social	Demographic change – labour shortage	-	-	-	Z
	Aging population	-	-	-	Z
	Increased mobility	-	-	-	Z
	Diversity in society	-	-	-	Z
	Migration	-	-	2	Z
	Mix of cultures	2	1	8	Z
	Change of culture – multi-cultural society	-	-	-	Z
	Project based work – new ways of work	5	8	-	SE
	Women's role in working life	1	6	3	SE
	New generations – new demands and requirements	-	-	-	SE
	Higher level of education (higher human capital)	-	-	-	SE
	Natural disasters	-	-	-	SE
	Job rotation – maintaining skills and experiences	6	2	2	SE
	Mix of working life and private life	8	10	-	SE
	Infrastructure of work space and work places	10	8	2	SE
New family structures	-	-	-	SE	
Technological	Information and Communication Technology (ICT)	9	5	-	Z
	Knowledge management systems	2	1	3	Z
	Intelligent building systems	-	-	-	Z
	Faster technological change	3	9	2	Z
	Security	-	-	-	Z
	Stronger risk management methods	1	1	8	Z
	New technologies in manufacturing	1	-	4	SE
	Green buildings	-	-	-	SE
	Information over flow	-	-	-	SE
Economic (incl. market issues)	Globalisation	6	8	-	Z
	Internationalisation – Europeanization	2	1	7	Z
	Financial restrictions (budget restrictions)	-	-	-	Z
	Increasing cost pressure	-	-	-	Z
	Financial restrictions within the health sector	-	-	-	Z
	Real estate valuation – opportunity for FM	-	-	-	Z
	Competition as a new phenomena in the health sector	-	-	-	Z
	Individualisation of needs	-	-	-	Z
	Increasing energy prices	1	1	6	Z
	More professional customers	-	-	-	Z
	New systems, e.g. payment, finance	-	-	-	SE
Uncertain economic fluctuations	-	-	-	SE	
Political (incl. legal issues)	Increased focus on sustainability	2	2	5	Z
	Consequences of climate changes	4	4	-	Z
	Stronger role of servicing department	-	-	-	Z
	Simplified legislation	-	-	-	SE
	Changed values/ethics	1	-	2	SE
	Change in perception of time	1	1	8	SE

Results from discussions and prioritizations of megatrends in the strategic environment of the FM sector in Sweden.

Z: megatrends from FM Futures workshop in Zürich 2008.

SE: supplemented megatrends from workshop on Foresight for Facilities Management in Sweden 2011.

The six megatrends of the strategic environment selected as the most significant are:

- Infrastructure of work space and work places: This megatrend has the highest ranking among the workshop participants and is further considered to be a very certain megatrends.
- Information and Communication Technology (ICT): This megatrend is ranked rather high and is among the workshop participants considered to be a rather certain megatrend.
- Mix of working life and private life: This megatrend is ranked rather high and is among the workshop participants considered to be a very certain megatrend.
- Globalisation: This megatrend is ranked rather significant and is among the workshop participants considered to be a rather certain megatrend
- Job rotation – maintaining skills and experiences: This megatrend is ranked as rather significant and it should be noted, that the participants disagreed whether or not this megatrend should be considered to be certain or uncertain.
- Project based work – new ways of work: This megatrend is ranked as significant and is amongst the megatrends regarded as most certain by the participants



Dimension 2: Current trends and challenges for the FM sector in Sweden

Workshop approach

This part of the workshop was supported by a list of current trends and challenges observed for the FM sector [iii]:

1. Outsourcing.
2. From single service towards multi-service and integrated facilities.
3. From operational towards strategic focus.
4. From cost reduction towards added value before the financial crisis.
5. New forms of procurement - partnership based collaboration.

6. ICT development => changing needs for support of workplaces and infrastructure and for internal process development in the FM supply chain.
7. Increased focus on sustainability and corporate social responsibility creates new FM activities and opportunities.
8. Increased cross-border coordination of FM in multinational companies and use of international service providers.
9. Increasing need for educations on all levels as well as R&D.
10. Pressure for decreasing FM costs per workplace.

This part of the workshop was structured by the following two leading questions:

- **Question 1:** *What keeps a professional FM awake at night right now?*
 - In small groups: Discuss and supplement the list of current trends and challenges for the FM sector in Sweden. Write a PostIt note for each trend/challenge.
 - In plenum: Clustering of trends and challenges.
- **Question 2:** *Identify the most significant trends and challenges in short term and long term.*
 - Each participant: Indicate by use of five ‘blue dots’ the five most significant trends or challenges in a short term perspective.
 - Each participant: Indicate by use of five ‘yellow dots’ the five most significant trends or challenges in a long term perspective.

Findings and reflections related to dimension 2

Topic	Significance		
	short term	long term	
How to increase productivity from vendors	6	3	
Uniform delivery of multiple sites in several countries	3	4	
Manage increased costs	-	6	
How to increase collaboration between internal service functions	3	-	
Sustainability	-	6	
TFM or single services	1	2	
Clarifying the FM role in organisation and it's services, define core businesses, services	7	-	
Advanced knowledge in technical FM related systems (MIS, Digital Real Estate systems)	3	1	
In international FM solutions. How to balance the demand on standardised services and at the same time deliver a tailor-made FM operation	-	8	
‘More for less’ – From a customer perspective	2	6	
Multi skills (job rotation)	1	1	
Preferred single outsourcing – ‘the speaking partner’	2	2	
Technology & new way to work – meet needs	9	3	
How to find cost savings in the third or fourth generation outsourcing	3	1	
Added Value	How to succeed in delivering low price FM series and time deliver added value	1	6
	Quality and function important beside price formation	2	
	Added Value	5	1
	Core biz value added	2	-



The four current trends and challenges assessed to be most significant in a short time perspective are:

- Technology & new way to work – meet needs
- Clarifying the FM role in organisation and it's services, define core businesses, services
- How to increase productivity from vendors
- Added Value

The five current trends and challenges assessed to be most significant in a long time perspective are:

- In international FM solutions. How to balance the demand on standardised services and at the same time deliver a tailor-made FM operation
- Manage increased costs
- Sustainability

- ‘More for less’ – From a customer perspective
- How to succeed in delivering low price FM series and time deliver added value

The clustering and priority setting of current trends and challenges identified a larger group on issues related to added value. These topics were considered to be of significance in both a short time and a long term perspective.

Dimension 3: Future need for new competences and new knowledge for the FM professionals

Workshop approach

This part of the workshop was supported by a list of FM competences suggested by EuroFM [iii] structured by use of the following headlines: Managing services; Managing the work environment; Managing resources; Understanding business organization; Managing people and Managing premises.

This part of the workshop was structured by the following two leading questions:

- **Question 1:** *Which needs does the FM sector have for new knowledge and new competences?*
 - In small groups: Discuss the needs for new knowledge and new competences.
 - In plenum: Presenting and writing on flip-over the results of group discussions.
- **Question 2:** *Identify the most significant needs for new knowledge and new competences.*
 - Each participant: Indicate by use of five ‘blue dots’ the five most significant needs for new knowledge and competences.

Findings and reflections related to dimension 3

Needs for new knowledge and competences	Significance
Understanding organizations and change management	6
Visibility of FM for top management	5
Understanding service mindedness	-
Social ability and personal competences	8
Learning skills	-
Understanding the FM concept	5
Understand customer changes	2
Manage the gap between customer demands and resources	7
How to measure added value	8
The professional status of FM staff	1
Work place design – understanding psycho social and physical issues (HR skills)	4
Innovation – thinking out of the box	4

The six three most significant needs for new knowledge and competences are:

- Social ability and personal competences.
- How to measure added value.
- Manage the gap between customer demands and resources.
- Understanding organizations and change management.
- Visibility of FM for top management.
- Understanding the FM concept.

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- [i] B.-Å. Lundvall (Ed.), *National Systems of Innovation - Towards a Theory of Innovation and Interactive Learning*, London, Pinter Publishers, 1992.
 - [ii] F. Malerba, *Sectoral Systems: How and Why Innovation Differs across Sectors*. In: Fagerberg, J., Mowery, D. C.; Nelson R. R., *The Oxford Handbook of Innovation*, Oxford University Press, 2005.
 - [iii] P.A. Jensen; P. Dannemand Andersen, *The FM Sector and its Status in the Nordic Countries*, *Center for Facilities Management*, Technical University of Denmark, October 2010.

Appendix 1. Participants

Potential participants were invited by IFMA Sweden aiming at a broad presentation of FM professionals in Sweden. The actual participants were:

Ola Hernström, Compass
Mikael Esplinger, Deloitte
Lasse Jensen, Svenska Spel
Björn Mosell, Microsoft, GEMS
Lasse Johanson, Svea Hovrätt
Pia Andersson, Sodexo
Thorleif Nilsson, Regeringskansliet
Anette Olofsson, Regeringskansliet
Håkon Arnstad, CapGemini
Heléne Jansdottor Lindholm, Mentor Online
Jenny Lundstrøm, Compass
Erik Ahrsjö, IFMA
Arne Höggren, IFMA



Foresight for Facilities Management in Finland

Documentation from workshop at SOL-city in Helsinki

18 May 2011

Introduction

Aim of workshop

The workshop is part of the project 'Foresight on Facilities Management (FM)', which will target the formulation of a Nordic FM strategy on research and education.

The project will include discussions and reflections of research themes and competences for the future of the FM profession by use of structured workshop at national level on three overall themes: i) sector and market, ii) future trends and challenges, and iii) research and education.

The aim of the workshop was:

- to collect experiences and viewpoints from Finnish professionals in the field of FM development
- to compare findings across the Nordic countries on FM trends and issues

Participants

10 FM professionals participated in the workshop representing FM clients, FM providers and FM education in Finland.

Facilitators

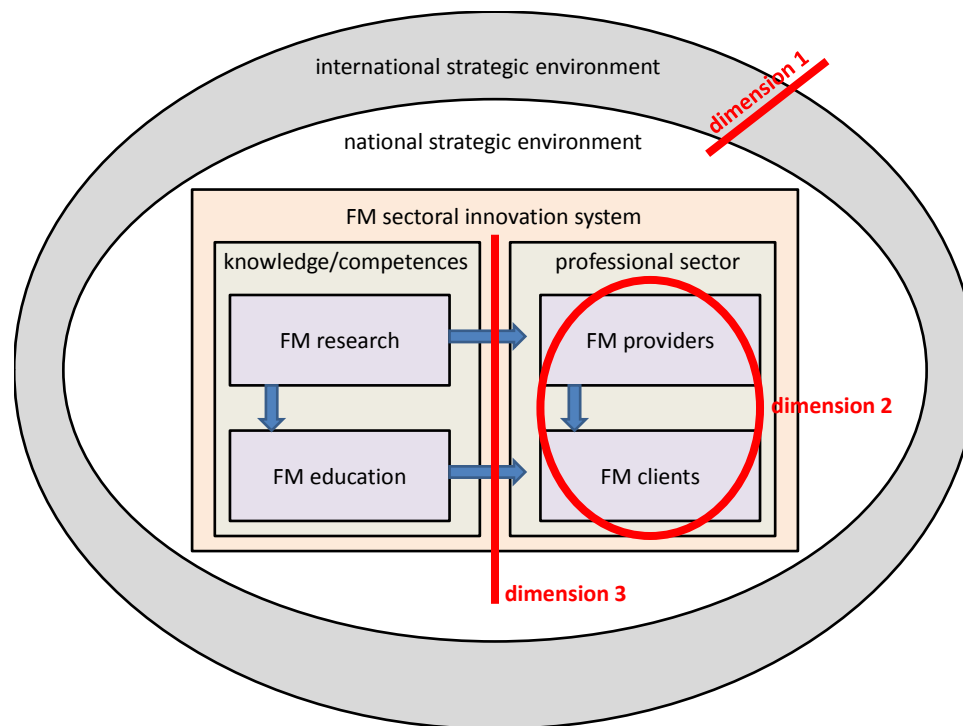
The workshop was facilitated by Head of Section Per Dannemand Andersen and Senior Researcher Birgitte Rasmussen from the 'Innovation Systems and Foresight' section at DTU Management Engineering.

A simple innovation system framework for the FM sector

Several frameworks of the FM innovation system have been developed in order to assist or guide different analytical needs. For our purpose with focus on FM foresight, a simple (sectoral innovation system) framework of the FM sector and its strategic environment is regarded to be a useful tool to guide the analyses and processes, see figure next page.

Generally speaking, the innovation systems approach is a framework embracing a set of powerful concepts such as: relationship, boundary, input, output, environment, feedback, communication, control, and identity. An innovation system can be defined as the '*elements and relationships which interact in the production, diffusion and use of new and economically useful knowledge*' [i]. A sectoral innovation system approach comprises three dimensions: a) knowledge and technological domain, b) actors and networks, and c) institutions [ii].

The FM sector in this understanding consists of a number of providers that provides FM services to their customers or clients. Public FM research and FM educations and courses provide new (research based) knowledge and professionals (graduates) to the sector. The sector and the affiliated research and education institutions exist within a national (e.g. Finnish) and international strategic environment.



Framework for FM sectoral innovation system

Dimensions in foresight for Facilities Management

The foresight on facilities management is structured by three overall dimensions reflecting significant conditions and matters for development within the FM sectoral innovation system:

- **Dimension 1:** *Megatrends in the strategic environment of FM*
 - This dimension deal with megatrends in the strategic environment of the FM sector in Finland that are going to affect the FM sector within the next two decades.
 - These megatrends can be characterised as external frame conditions and are mostly outside the influence of the actors within the FM sector.
 - We distinguish between the national (i.e. Finnish) strategic environment and the international strategic environment. In practices this distinguishing often is difficult.
- **Dimension 2:** *Current trends and challenges for the FM sector in Finland*
 - This dimension deals with trends within the FM sector in Finland
 - A trend is in this context defined as an inclination or a tendency that has been observed during the recent few years and that is expected to prevail during the next few (3-5) years.
 - These trends are mostly susceptible to influence by the actors within the FM sector – or results of a strategic or managerial decision taken by FM actors under consideration of developments in the external environment.
- **Dimension 3:** *Future need for new competences and new knowledge for the FM professionals*
 - This dimension deals with the need for generation of new knowledge and competence building within the FM sector.
 - The job profile and key qualification of FM professionals is of a generalist nature and cross-functional oriented. The profession uses knowledge and tools from a number of other professions and disciplines.
 - The key question for this project is: ‘What should be the curriculum for a formal education in FM? We here understand curriculum as the set of courses, and their content, that should be offered to students of FM at a university level.

Dimension 1: Megatrends in the strategic environment of the FM sector in Finland

Workshop approach

This part of the workshop was supported by a list of megatrends for the external environment of the FM sector based on results from 'FM Futures workshop in Zürich 2008'. The list was structured by use of the STEP approach grouping the megatrends in four categories: Social, Technology, Economy and Political.

This part of the workshop was structured by the following two leading questions:

- Question 1: Which megatrends will impact the FM sector within a time horizon of 10-15 years?
 - In small groups: Discuss and supplement the list of megatrends in the external environment.
 - Each participant: Indicate by use of five 'blue dots' the five megatrends of highest significance for the FM sector in Finland.
- Question 2: Identify the most certain and uncertain megatrends among the selected significant megatrends.
 - Each participant: Indicate by use of five 'green dots' the five most certain megatrends among the selected significant megatrends.
 - Each participant: Indicate by use of five 'red dots' the five most uncertain megatrends among the selected significant megatrends.

Megatrends in the external environment
 Additional megatrends from FM Futures workshop in Finland

STEP	Megatrend in the external environment	Impact	Uncertainty
	Longer careers		
	Smart technologies/materials (nano...)	●●●●●	●●●●●
	Changes in public sector	●●●●●	●●●●●
	Public-Private Partnerships		●●●●●
	Mindsets and work conditions		
	Area and urban development	●●●●●	●●●●●
	Young generation ~ working style / places	●●●●●	●●●●●
	Zero energy houses	●●●●●	●●●●●
	New services ⇒ new workers		●●●●●
	CO ₂ compensation	●●●●●	●●●●●
	Merging of municipalities	●●●●●	●●●●●
	New demand for well being	●●●●●	●●●●●
	Increased regulation - building		●●●●●
	New technologies in the work place		●●●●●
	New contract models	●●●●●	●●●●●
	Value profile - changes	●●●●●	●●●●●
	Individualisation of needs		●●●●●

Photo from the workshop showing the poster with megatrends and illustrating the use of blue, green and red dots in relation to the list of megatrends in the strategic environment

Findings and reflections related to dimension 1

STEP category	Megatrends in the strategic environment	significance	certain	uncertain	
Social	Demographic change – labour shortage	1	1	3	Z
	Aging population	2	5	-	Z
	Increased mobility	2	-	7	Z
	Diversity in society	-	-	-	Z
	Migration	-	-	-	Z
	Mix of cultures	1	1	5	Z
	Change of culture – multi-cultural society	-	-	-	Z
	Professional FM employees - shortage	2	2	6	FI
	Longer professional careers	-	-	-	FI
	Changes in the public sector	5	3	5	FI
	Mindship and work conditions	-	-	-	FI
	Area and urban development	5	6	-	FI
	Young generation – working styles and places	-	-	-	FI
	New services => new workers	-	-	-	FI
	Merging of municipalities	-	-	-	FI
	New demands for well being	4	4	2	FI
	Individualisation of needs	-	-	-	FI
Value profile - changes	3	7	-	FI	
Technological	Information and Communication Technology (ICT)	-	-	-	Z
	Knowledge management systems	-	-	-	Z
	Intelligent building systems	-	-	-	Z
	Faster technological change	-	-	-	Z
	Security	1	4	2	Z
	Stronger risk management methods	-	-	-	Z
	Smart technologies/materials (e.g. nano)	5	3	3	FI
	0-energy buildings and houses	1	3	6	FI
	New technologies in the work place	-	-	-	FI
Economic (incl. market issues)	Globalisation	-	-	-	Z
	Internationalisation – Europeanization	-	-	-	Z
	Financial restrictions (budget restrictions)	-	-	-	Z
	Increasing cost pressure	-	-	-	Z
	Financial restrictions within the health sector	-	-	-	Z
	Real estate valuation – opportunity for FM	-	-	-	Z
	Competition as a new phenomena in the health sector	-	-	-	Z
	Individualisation of needs	2	-	5	Z
	Increasing energy prices	-	-	-	Z
	More professional customers	-	-	-	Z
	Public Private Partnerships	-	-	-	FI
New contract models	2	1	5	FI	
Political (incl. legal issues)	Increased focus on sustainability	9	7	-	Z
	Consequences of climate changes	-	-	-	Z
	Stronger role of servicing department	-	-	-	Z
	CO2 compensation	5	3	1	FI
	Increased regulation - buildings	-	-	-	FI

Results from discussions and prioritizations of megatrends in the strategic environment of the FM sector in Finland.

Z: megatrends from FM Futures workshop in Zürich 2008.

FI: supplemented megatrends from workshop on Foresight for Facilities Management in Finland 2011.

The six megatrends of the strategic environment selected as the most significant are:

- Increased focus on sustainability: This megatrend has the highest ranking among the workshop participants and is further considered to be a very certain megatrends.
- Area and urban development: This megatrend is ranked rather high and is among the workshop participants considered to be a rather certain megatrend.
- Changes in the public sector: This megatrend is ranked rather high and it should be noted, that the participants disagreed whether or not this megatrend should be considered to be certain or uncertain.
- Smart technologies/materials: This megatrend is ranked rather high and it should be noted, that the participants disagreed whether or not this megatrend should be considered to be certain or uncertain.
- CO2 compensation: This megatrend is ranked as rather significant and the trend is regarded as rather certain.
- New demands for well being: This megatrend is ranked as rather significant and the trend is regarded as rather certain.

The participants expressed that employees to some extent was hard to understand due to the general increasing level of education in society.

At the workshop it was discussed whether or not mobility will continue to be an important issue. The viewpoint was expressed that we are beyond the hype of mobility and that we in the future want the employees to come to office and travel less time. On the other hand, also the opposing viewpoint was expressed that looking at all companies, mobility is still expected to be an important issue.

Finally it was discussed, that changes are expected in the public sector which will have an impact on FM, but it is hard to say what will happen.

Dimension 2: Current trends and challenges for the FM sector in Finland

Workshop approach

This part of the workshop was supported by a list of current trends and challenges observed for the FM sector [iii]:

1. Outsourcing.
2. From single service towards multi-service and integrated facilities.
3. From operational towards strategic focus.
4. From cost reduction towards added value before the financial crisis.
5. New forms of procurement - partnership based collaboration.
6. ICT development => changing needs for support of workplaces and infrastructure and for internal process development in the FM supply chain.
7. Increased focus on sustainability and corporate social responsibility creates new FM activities and opportunities.
8. Increased cross-border coordination of FM in multinational companies and use of international service providers.
9. Increasing need for educations on all levels as well as R&D.
10. Pressure for decreasing FM costs per workplace.

This part of the workshop was structured by the following two leading questions:

- **Question 1:** *What keeps a professional FM awake at night right now?*
 - In small groups: Discuss and supplement the list of current trends and challenges for the FM sector in Finland. Write a PostIt note for each trend/challenge.
 - In plenum: Clustering of trends and challenges.
- **Question 2:** *Identify the most significant trends and challenges in short term and long term.*
 - Each participant: Indicate by use of five ‘blue dots’ the five most significant trends or challenges in a short term perspective.
 - Each participant: Indicate by use of five ‘yellow dots’ the five most significant trends or challenges in a long term perspective.

Findings and reflections related to dimension 2

Topic	Significance	
	short term	long term
Insourcing and tailor made solutions	3	1
Insourcing rather than outsourcing	1	-
‘Come back to the office’ & ‘No more one size fits all solutions’	2	-
Sustainability	4	5
Energy saving in FM (active energy management, incentives for service providers)	6	-
Sustainable FM service provider is a ‘must’ in demand site (certificates etc.)	-	-
From kwh measuring to CO2 measuring (carbon foot print)	-	1
Social aspect of sustainability (using local partners for ideological reasons)	-	2
Green thinking (does anyone want to pay for green?)	1	-
‘Housing FM’	-	10
New business potential for FM in housing sector (especially senior housing)	1	-
Housing management and building management are getting closer together	-	-
ICT	1	-
Integrated technology solutions	1	5
Strategic focus	3	1
Marketing of FM (increase awareness, importance of certificates)	4	-
Change in management policies (from managing time to managing results)	-	3
Working environment as one of the strategic resources	-	-
From operational focus to strategic (reliable measurement of added value?)	-	1
Reliable measures for adding value (e.g. productivity, sustainability goals, quality)	1	1
Changing markets	4	1
Maturity of markets (can FM be a ‘trend-setter’? is the market ready?)	-	-
Nightmare. Small market – just few big service providers, few followers	-	2
Challenge. How to develop new services?	-	1
Mixed use & service & places	1	-
Corporate offices become social interaction nodes	1	3
Cost efficiency (multi users offices and places based on some common core, office buildings into leisure use in spare time)	5	1
Synergy hub	1	4
A mix of residential, commercial + office environments	1	2
Comprehensive mix of services in business parks + offices (work life balance)	4	-
Comprehensive service packages	-	-



The six current trends and challenges assessed to be most significant in a short time perspective are:

- Energy saving in FM (active energy management, incentives for service providers)
- Sustainability
- Cost efficiency (multi users offices and places based on some common core, office buildings into leisure use in spare time)
- Marketing of FM (increase awareness, importance of certificates)
- Changing markets
- Comprehensive mix of services in business parks + offices (work life balance)

The four current trends and challenges assessed to be most significant in a long time perspective are:

- Housing FM
- Integrated technology solutions
- Sustainability
- Synergy hubs

At the workshop it was stressed that housing FM is not only about cleaning but in the future there will be high awareness on FM services also including care due to aging population with more elderly people.

Dimension 3: Future need for new competences and new knowledge for the FM professionals

Workshop approach

This part of the workshop was supported by a list of FM competences suggested by EuroFM [iii] structured by use of the following headlines: Managing services; Managing the work environment; Managing resources; Understanding business organization; Managing people and Managing premises.

This part of the workshop was structured by the following two leading questions:

- Question 1: Which needs does the FM sector have for new knowledge and new competences?
 - In small groups: Discuss the needs for new knowledge and new competences.
 - In plenum: Presenting and writing on flip-over the results of group discussions.
- Question 2: Identify the most significant needs for new knowledge and new competences.
 - Each participant: Indicate by use of five ‘blue dots’ the five most significant needs for new knowledge and competences.

Findings and reflections related to dimension 3

Needs for new knowledge and competences	Significance
Green use and maintenance	6
Urban FM, e.g. development of areas with former industrial properties	9
Smart and intelligent environment	7
Consumer perspective, understanding users	-
Housing FM	7
Certificates and standards (e.g. combining certificates to taxing, measuring right things)	1
Integrating FM, HR and ICT	-
Real life, including practitioners in research and teaching	6
Marketing FM for all people and employees	2
Measurement of impact	-
Implementation of research knowledge	7

The six most significant needs for new knowledge and competences are:

- Urban FM, e.g. development of areas with former industrial properties
- Smart and intelligent environment
- Housing FM
- Implementation of research knowledge
- Green use and maintenance
- Real life, including practitioners in research and teaching

It was remarked that the issues addressed related to competences and knowledge discussed at the workshop were different than issues discussed among FM professionals five years ago. Earlier there has been a strong focus on sustainability at a general level but today the issues are more precisely and concrete formulated but still with a strong focus on sustainability.

It is interesting to note that there today is stronger focus on involvement of practitioners in research and development of FM and that there is much more emphasis on knowledge sharing and networks.

In Finland lack of house managers can be expected within the next 10 years and it is of importance to motivate young people to go into this part of the FM segment.

- [i] B.-Å. Lundvall (Ed.), *National Systems of Innovation - Towards a Theory of Innovation and Interactive Learning*, London, Pinter Publishers, 1992.
- [ii] F. Malerba, *Sectoral Systems: How and Why Innovation Differs across Sectors*. In: Fagerberg, J., Mowery, D. C.; Nelson R. R., *The Oxford Handbook of Innovation*, Oxford University Press, 2005.
- [iii] P.A. Jensen; P. Dannemand Andersen, *The FM Sector and its Status in the Nordic Countries*, Center for Facilities Management, DTU Management Engineering, Report 21.2010, October 2010.

Appendix 1. Participants

Potential participants were invited by Fifma aiming at a broad presentation of FM professionals in Finland. The actual participants were:

Riku Pentikäinen, Nokia
Maija Ahokas, Rapal
Tiia-Maria Koivusaari, SRV
Heidi Rasila, Aalto University
Inka Kojo, Aalto University
Anna-Liisa Lindholm, Aalto University
Suvi Nenonen, Aalto University
Kari Nissinen, VTT
Matti Puromäki, SOK
Jessica Karhu, Aalto University



The objective of this project was to identify foresights of the possible futures of Facilities Management (FM) in the Nordic countries in Europe and based on this to establish a proposal for a common research agenda, which can stimulate research in FM and increase the collaboration between universities in the different Nordic countries and between researchers and practitioners.

The project has included workshops in each of the four countries Denmark, Finland, Norway and Sweden followed by a joint workshop with participants across the Nordic countries during CFM's Nordic conference in August 2011.

A literature review was performed in order to supplement the trends and drivers identified at the workshops. On basis of the workshops and the literature review a Delphi questionnaire was developed comprising 40 statements. The purpose of the questionnaire was to identify and make a prioritization of the most importance themes in a strategy for research and education.

The outcome of the Delphi questionnaire indicated that a common Nordic research agenda should be structured around the following two headlines: a) Value and professionalization of FM, and b) Sustainability in FM Services.

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