

Input for the 2015 FM Research and Action Agenda

Wim R. Pullen

Center for People and Buildings, Delft. E: w.r.pullen@tudelft.nl; W: www.cfpb.nl

Theo J.M. van der Voordt

Delft University of Technology, Faculty of Architecture, Department of Real Estate & Housing
E: D.J.M.vander Voordt; W: www.re-h.nl

Jaap Hanekamp

HAN Research Zoetermeer. E: hjaap@xs4all.nl

Abstract

One of the aims of EFMC 2009 is to develop a research agenda and action plan for Facility Management (FM) with a time horizon of at least five to seven years. In order to collect input for this agenda, the Delft Center for People and Buildings organised a number of round-table discussions with representatives of professional FM journals, FM professionals and academics. A wide variety of subjects were covered. Some of these subjects came up in almost all sessions, such as sustainability, the changing role of facility managers and facility management (from operational to strategic, from cost efficiency to added value), corporate social responsibility and FM education. Furthermore all papers that have been submitted to the EFMC 2009 research symposium have been analysed with regard to the research questions and proposed next steps. The papers show that we share one world with different problems that need joint efforts to deliver sustainable (durable) solutions. The present paper discusses a number of shared problems and challenges against the background of the key themes of EEFM 2008 - 2009. The findings from the round table discussions and the cross paper analysis have been translated in building blocks for the 2015 FM Research and Action Agenda. This agenda challenges the FM community to integrate knowledge from different research programs and projects and to get more synergy out of it, with as a final aim to contribute to sustainable solutions of societal problems, to build up a sound "evidence based" FM body of knowledge and to work on new research methods.

Introduction

A number of interesting themes were discussed at the 7th EuroFM Research Symposium during EFMC 2008, including usability (concepts, theory and methods, case studies, future developments), sustainability, added value of FM, value analysis, workplace management, FM processes, FM benchmarking and FM context. Usability was defined as a combination of efficiency, effectiveness and satisfaction or positive experiences. At the beginning of the symposium, one of the organisers, Keith Alexander, noticed that FM research mainly *followed* practical application. He made a case for developing FM as a scientific discipline in order to promote evidence-based FM in practice. At the same time, FM research should respond to the need for real-world, people-centred and action-oriented concepts and tools so that facility managers can act as 'reflective practitioners'. According to Keith Alexander, it is important to take into account the context-specificity and cultural sensitivity of FM. As such, his presentation demonstrated the need to link theory to practice, not only *ex post* but in particular *ex ante*, before FM actions are conducted. This pro-active approach was also discussed during a plenary session of the Business Conference, when a number of board members of umbrella organisations presented key challenges and goals for the future agenda of FM. The participants came up with a long list that included sustainability, FM strategies linking FM to business strategies and added value, risk management, change management, education in FM, standardisation and procurement, and services 'across the borders'.

A comparison of the key topics of EFMC 2009 and EFMC 2009 shows both continuity and change of subjects (Table 1). The main themes of the EFMC 2009 Business Conference and the topics of interest of the EFMC 2009 Research Symposium include similarities and dissimilarities as well (Table 2). The issues clearly show the diversity and complexity of FM. All these issues are worthy of international study and summary in a state-of-the-art report.

Table 1: Key topics of EFMC 2008 and EFMC 2009 (underlined = same as in 2008)

EFMC 2008 Facility Management: adding value to core business. Strategies – Opportunities – Functionality	EFMC 2009 One world, different problems – joint efforts, sustainable solutions!
<ul style="list-style-type: none"> • Strategies in a Global World • Change Management and Process Orientation • Adding Business Value and the Economics of FM • Business Continuity and Risk Management • Sustainability and Energy Management • Customer Services and Quality Management • Future Developments: Business and Technology Trends • Partnership across Borders • Workplace Management • Usability 	<ul style="list-style-type: none"> • <u>FM Strategies in a Global World</u> • <u>Partnership Across Borders</u> • (Re-) Defining Core Business of FM: FM <u>Adding Value to Core Business</u> • Life Cycle Management • <u>The Economics of FM</u> • Sustainability and Energy Management • <u>Future Developments</u> and Innovation in FM • <u>Business Processes and Technology Trends</u> • Facility Operations: <u>Usability</u>, Customer Services and Management • <u>Workplace Trends</u>

Table 2: Issues in the EFMC 2009 Call for Papers

Main themes of the Business Conference	Topics of Interest of the Research Symposium
<ul style="list-style-type: none"> • Strategic FM and FM Strategies in a Global World • (Re-) Defining Core Business of FM: FM Adding Value to Core Business • The Economics of FM • Sustainability and Energy Management • Facility Services: Usability, Customer Services and Quality Management • Future Developments and Innovation in FM: Business Processes and Technology Trends • Partnership Across Borders • Workplace/Workspace Management and “Lifeplace” Management • Life Cycle Management: The link between Construction, Real Estate Management and FM? • FM and Corporate Social Responsibility • Intelligent Building 	<ul style="list-style-type: none"> • Workplace management • Spatial layout • Usability • User participation • Service performance measurement • Service driven innovation • Sustainability and durability • Value chain and added value of FM • Real estate governance • Policies in FM • Social aspects of workplace innovation • Linking HRM with FM

However, in order to deliver sound empirically tested theories, business cases, best practices and decision support tools on different levels (strategic, tactical, operational) there is a need for focus and longitudinal studies in depth and more interaction between researchers and practitioners. For this reason all contributors to EFMC 2009 have been asked for their ideas about the future FM Agenda 2015.

The FM 2015 Research Agenda: methods for data collection

To get an idea of priorities in the current and future research agenda, we took two steps:

- We organised three round-table talks with editors of professional FM journals in the Netherlands and FM and Real Estate managers from public and private organisations.
- We analysed all papers that were contributed to the 8th research symposium at EFMC 2009.

First, the findings will be discussed separately. Second, we will compare the findings from both steps in search of similarities and dissimilarities. Finally we present our reflections and conclusions and give some recommendations for the 2015 FM Research and Action agenda.

Dutch input from round table talks

The assignment to brainstorm about the future of FM is far from simple. After all, developments are notoriously difficult to predict. Ten years ago, who could ever have imagined that mobile phone technology would make such a developmental leap forward? Who could have foreseen the rise and fall of courtesy services for employees such as in-house barbers and grocery delivery services?

Nevertheless, uncertainty about the future did not prevent round-table participants from rising enthusiastically to the challenge. The following topics are just a selection of the many issues that arose during the discussions.

The changing role of the facility manager

According to the round-table participants, the current shift in focus from operations towards strategy will continue. While cost efficiency remains crucial, the drive to develop added value is every bit as important. This can be accomplished by using facilities to improve employee welfare and bolster the image of the company or organisation (setting the tone by means of building design and furnishings), as well as PR, marketing and operating results. Conceptual thinking and thinking in terms of the potential added value of FM are both gaining ground. However, a greater focus on strategic thinking must not come at the expense of timely and effective action on an operational level. The move toward more strategic operations requires facility managers to take a different approach, and to have deeper and more wide-ranging skills and expertise. They must be able to bring FM to the CEO's attention, ask critical questions and be persistent even to the point of making a nuisance of themselves if necessary. Facility managers are constantly under pressure to satisfy conflicting demands. How can they reconcile the demands of both internal and external clients while also respecting the reigning social norms? How can they meet ever-increasing expectations regarding the quality and speed with which facilities, services and resources are provided, the price/performance ratio, sustainability, etc? How can facility managers achieve the ideal balance between centralisation and decentralisation, ensuring that the potential benefits of centralisation (economy and efficiency) are not lost as a result of the greater distance between FM and the primary process? And how can they simultaneously ensure excellent quality of service (employee satisfaction), sufficient performance of products and services, and 'willingness to pay'? These are all important issues that must be addressed by FM training programmes.

While facility managers carry a degree of a responsibility for defining and expanding the framework within which they operate, the round-table participants agreed that the primary responsibility for establishing clear decision frameworks should lie with management. It goes without saying that these frameworks must leave sufficient room for creativity. One major point of discussion is the relationship between FM and other disciplines, particularly Real Estate. Another concern is finding an appropriate balance between rational decision-making and management on the basis of emotion, and between 'hard' and 'soft' factors. Anglo-Saxon performance models such as the Balanced Scorecard devote a great deal of attention to increasing productivity, but leave little room for indicators of security and welfare. One interesting avenue for further research is the degree of context-sensitivity of the contribution made by FM, such as the extent to which it is affected by corporate culture. Research into a typology of corporate cultures could shed more light on this issue. Another interesting topic for further research is the delineation of the differing responsibilities of owners and facility managers.

Switching between scales: object and portfolio

Large organisations tend to require the use of many different buildings. In order to manage facilities effectively at the portfolio level, reliable data is needed. Often, however, this is not a priority. Many organizations lack a clear picture of their portfolio as a whole. Data is often lost in the course of mergers. Strategic concerns are also still undervalued. When it comes to business economics, cost reduction is always an important goal, but employee satisfaction and engagement are just as critical. In order to remain in touch with the needs and desires of their employees, some firms make use of Global Engagement Surveys and pre-move and post-move surveys. The resulting data provide a rich source from which more general conclusions can be drawn. It is important for umbrella organizations to make this data more widely available. Further points of consideration for the future include change management, expectation management, the identification and dissemination of best practices regarding cost efficiency and the quality of the workplace environment, and the facilitation of communication between FM and RE on both the portfolio level (more strategic) and the local level (everyday practice).

Sustainability

The theme of sustainability is at the top of everyone's list. Sustainability isn't just about the *planet* (green buildings, energy efficiency, and other environmental issues), but also about *people* (well-being), *profit* (costs and revenues; economic issues) and *project* (how to go about achieving

sustainability). In practice, sustainability is often paid lip service but is ultimately assigned a low priority. This represents a major challenge for facility managers. How can they ensure that sustainability receives a place on the FM agenda? How can they translate the abstract concept of sustainability into concrete measures? Is it wise to link public interest to business ethics? How can facility managers ensure that the concept of sustainability is firmly embedded in all levels of the organisation, from high to low? How can they measure whether or not objectives such as reducing CO₂ emissions by 40% or becoming 'climate neutral' have been achieved, and how can they be sure which measures have led to these successes? Modern technology, such as the use of sensors, and clear communication about achievements ('we're the most energy-efficient department') are important tools for monitoring progress and encouraging staff to change their habits. In order to achieve 'quick wins', it may be wise to begin with small, easily-achievable matters, such as arranging for environmentally-friendly catering. Many people are rather sceptical about the hype surrounding the 'Cradle to Cradle' concept, feeling that it is primarily a marketing angle. When it comes to sustainability, attractive design and the ability to use a space for a wide range of functions seems to be at least as important as energy efficiency and environmentally-friendly material choices.

A related theme (which is also relevant in other areas) is the importance of reducing commuter traffic, such as by encouraging telecommuting. Why has telecommuting been so slow to catch on? Why do managers find it so difficult to assess performance based on output? How are business training programmes addressing the issue? What motivates people's behaviour? Should we not be moving toward performance-based contracts and benefits packages negotiated on an individual basis? The education and healthcare sectors seem to be ahead of the business sector in this respect, likely because facility managers are closer to the primary process and are more accustomed to viewing users as clients. Again, this raises a number of questions, such as who bears primary responsibility for making better choices, what is the role of FM in this process, and how best to coordinate efforts with HRM.

Corporate social responsibility

Along with the current shift in focus from cost efficiency toward the added value of FM for the organisation, there has been increasing interest in the social impact of FM and Real Estate. This new interest is part of an emerging trend toward corporate social responsibility. But what exactly *is* corporate social responsibility? How is it put into practice? Is it just another example of smart marketing? In order to demystify the concept, there is a need for well structured and carefully designed case studies that measure the meaning and objectives of corporate social responsibility and investigate the actual effects of the organisation's policy and interventions. Journals can play an important role in this process by publishing systematic descriptions of good examples of corporate social responsibility, as well as reflections on projects made by a panel of experts. How are trade-offs made between short-term objectives (profit), employee preferences and requirements, and long-term social goals such as business continuity and sustainability? How to achieve a win-win situation? Who decides what is successful, and how can success be measured? What is the role of professional associations in this process? The development of business cases can help to further awareness and rational decision-making. In this context, it is important to reflect on what an organisation and its buildings can do for the surrounding neighbourhood or city and vice versa. How can FM make a positive contribution to the quality of public spaces and help to strengthen social cohesion in the neighbourhood? What options are available for facility sharing? One intriguing possibility is the transformation of office parks and industrial estates into multi-purpose areas – a kind of 'corporate campus' – in a return to integrated living, working and shopping facilities. What would be the added value of this type of arrangement for a company or organisation and its employees, and what role does the facility manager have to play? What FM arrangements are needed to effectively support self-employed persons who work from home?

Building for the future

Another concept related to sustainability that is also of great economic importance is the design and construction of multi-purpose buildings that are suitable for different functions and different users and are flexible and easy to disassemble. In the commercial and industrial building sector, there is much to be learned in the coming years from PPS projects involving contracts for periods of 20 years or longer. Many changes in function can be expected to occur over such long periods of time. How will these changes be addressed? Will technological methods of dealing with change be replaced by

behavioural measures? Building for the future also means taking greater account of the needs of young people, the so-called "Einstein generation". But what are those needs, and will they change as young people move on to new phases of their lives, gaining obligations and responsibilities? These questions are relevant in many areas. For example, what types of study and work habits will arise in the future? Will school buildings as we know them continue to exist? What is the role of e-learning in primary school, secondary school, and the world of higher education?

During the round-table discussions, many other topics arose in addition to those mentioned above:

- What effects will the aging of the populace have? Are modifications to existing buildings necessary? Who is responsible for making this decision: FM or HRM? What types of work habits do young people have? How, when and where do they want to work? What consequences does this have for office accommodations and for business processes? What is the best possible location and design for call centres and alarm centres, taking into consideration that they are often staffed by young people? What options are available for those who want to work from home?
- How can facility sharing and joint vacancy management allow different companies to optimise their housing situations?
- To what extent are employers responsible for facilitating telecommuting? Are our demands realistic? What are the ideal arrangements with regards to working hours and telecommuting, taking into account the potential for conflict between the needs and rights of employees and the expectations of customers?
- Is there a demand for a 24-hour economy? What are the associated benefits and risks? What is the ideal balance between work and personal life? How can companies ensure a healthy corporate culture with a good balance between business considerations and employee welfare and preferences?
- What is the ideal balance between risk reduction and risk-taking in order to explore new opportunities?
- What impact will integrated contract forms in the building sector have on FM? How can building design and construction be better integrated with the provision of services, and whose responsibility is this?
- How to deal with the ever-growing problem of information overload? How to prevent managers from making one-sided decisions on the basis of easily-measurable SMART information?
- How to ensure that long-term goals are given high priority? Which scenarios are possible, desirable and likely for the year 2015? What major trends will the future bring?

International Input from EFMC 2009 Research Symposium papers

In order to prepare a discussion on the Future FM Research Agenda all authors submitting a research paper were asked to consider their subject in the light of this research agenda. The appendix of this paper summarizes all contributions of the authors. The appendix can be read as a tour d'horizon of questions, a description of possible connections of FM research to other fields and an explicit intention to go beyond what is routine. The findings have been used by the organizing committee to prepare a declaration of support to the 2015 Agenda by the conference participants and FM industry.

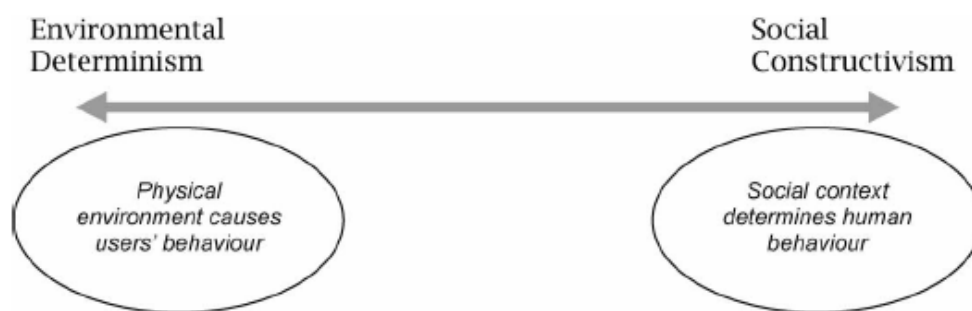
Again a number of different themes were unearthed, such as the added value of FM, economic effective implementation of FM, service performance, usability, workplace management and the effects on satisfaction and productivity, space management (m², spatial lay-out, use of IT-tools), risks and controls and sustainability (energy-efficiency). Some researchers investigate common subjects in other areas than usual e.g. innovative workplaces in psychiatric clinics, shopping centers and industrial places, or life cycle thinking in developing countries. Furthermore we noticed a different focus on either a businesslike approach - with research issues such as the (economic) added value of FM, cost reduction and space optimization - or a more social-psychological approach. Examples of the latter are research into employee satisfaction and social networks. Going through the papers some clear lines of thought take shape.

A broad societal view

Several authors emphasize the need for a broad societal perspective on FM. For example Wiegand, who works on enhancing service performance at remote distances, describes a long term perspective which goes beyond just a building, a user and FM operations: "The second road, which needs to and will keep us more and more engaged during the next 20 years, is the contribution of our work to solve

the problems of society – or to put it differently of humanity – e.g. the climate change, the increase of disparity between urban agglomerations and rural areas, and the aging society in the developed countries.” Pöyhönen, who studies shopping centers, postulates a similar statement: “The challenge is to link this research to sustainable development trends, policies and protocols”. Le Roux describes his study on improving energy-efficiency in office buildings in the context of the knowledge “that the built environment is responsible for 40% of the final energy consumption and CO₂ emissions in the European Union.” Jensen recognizes the importance of the broad view describing economical, social, spatial, environmental impacts in his FM Value Map. The same applies to Gersberg et al who point out that alternative workplace programs represent a very complex system of management approaches, work practices and activities, technology tools, and places.

Interesting in this context is the tantalizing observation by Price that “the dominant narrative of FM remains modernist and normative, rooted in environmental determinism”. He uses a diagram of Jacqueline Vischer (Vischer 2008) with dominant perspectives of environmental determinism and social constructivism.



Gersberg integrates both views; with a wink at Churchill's famous statement we could say “first we shape our buildings and thereafter we use them to change culture”.

FM: a discipline and/or science?

A number of authors appear to look at FM from a scientific perspective acquiring understanding of FM as a phenomenon. Their main focus is on complex systems of people using buildings, whether shopping centres, hospitals or office buildings. Other authors probably come from an engineering background and focus on designing and creating tools to support FM processes and facility managers. They seem to be most interested in the application phase of science which is closely related to the improvement of daily FM routines in business processes and decision making. As Wiegand writes: “In any case facility management will remain a discipline, which is not a science itself, but applies findings of “supporting” sciences – in our case of mathematics and operation research”.

Because FM is such a practical field an important question is in which way facility management is informed and directed by scientific knowledge. Three themes seem to arise from this year's EFMC research papers:

- Describing an inventory of options: “What is possible?” (Price)
- Delivering data, longitudinal and in depth or fast and continuously by using new measuring technologies such as sensors (Tolman and Parkkila)
- Delivering tools, “reference process descriptions (Bockstefl) or “generating new models, mathematical algorithms and IT technologies” (May).

What connects these worlds might be found in Arge's cry: “Until research and post-occupancy evaluations become an integrated part of practice, workplace concepts and buildings will continue to provide users with less physical, functional and psychological comfort than is necessary” - expressing the wish or belief ‘that research results will cause better practice’. An interesting debate in this context is the discussion on “scientism”:

“It could be argued that science, despite its *inherent provisional* nature, is increasingly treated as a belief that provides an unquestionable, all-encompassing, and guiding account of reality. Within the philosophy of science this is called *scientism* - that is roughly the idea that science alone is deemed to be capable of elucidating and resolving genuine and fundamental human concerns whereby all areas

of human life can be reduced to science (Stenmark, 2001; Haack, 2003). Scientism is amongst other things related to the issue of reductionism and its misrepresentations" (Hanekamp, Price *et al*/2009, to be published).

and

...“In academic research in facilities management, for instance, treatment of the methods used, data collection and limitations is still inadequate in not a few academic papers” (Ventovuori *et al*, 2007)... According to Ventovuori *et al*, “the authors had seldom justified their selection of research method. Furthermore, the reporting of the methods used was inadequate. Particularly the description of data collection was often missing. Additionally, most authors seem to avoid mentioning the limitations of their research”. Ventovuori *et al*. further remark that many papers could have been developed into pure research papers by referring to the existing body of knowledge. Then again, they put forward the mitigating observation that ‘this is characteristic of a completely new or emerging area of research.

We may conclude that FM research needs to show its research competences more explicitly and also to be more explicit about their own assumptions, research methods and limitations of the research. A lot could be learned from anthropologists always describing their own perspective. Extrapolative strengths and weaknesses, in other words, need to be on the viewscreen of FM researchers. Modern philosophy of science insights might be helpful here.

Reflections and conclusions

As we have noticed before, most subjects in EFMC 2009 research papers are either related to *understanding* complex organizational systems or to *improving* organizational/business processes or decision making through tools and processes. Both are part of the FM research tradition: “FM research should respond to the need for real world, people-centred and action-oriented concepts and tools so that facility managers can act as “reflective practitioners” (quote Keith Alexander, EFMC 2008). According to our opinion FM researchers should not just “respond to the need for...” but actively partner with, educate and challenge those reflective practitioners” while at the same time answering the question whether to put energy in those practitioners that are not reflective at all but keep you busy asking the traditional 10 million dollar question “how do I increase performance while cutting the costs?” time and again.

Facilities can be seen as business resources serving organisational goals. Facilities act with other business resources in support of objectives and outcomes. The extensive literature on the resource based view (RBV) of the firm is concerned with the way in which the firm’s current resource bundle shapes its future development (Lockett *et al*, 2009). In a comprehensive review of empirical research Newbert (2007) studied those resources (27 in number) in combination with capabilities (28 in number) and core competences (7 in number) - making up a heterogeneous mix of resources - and reports that 53% percent (!) of the papers he examined offered positive support of the link between resources (broadly defined) and performance. He also found that resource combinations and/or capabilities/competences are more likely to explain performance differences rather than single resources in isolation.

Lockett *et al* (2009) illustrate the value of the RBV theory with a list of practical insights:

- Managers need to understand what are the strengths and weaknesses of a firm. The internal characteristics of a firm are central to strategy formulation.
- The resource base of the firm is path dependent i.e. history matters.
- Managers need to be able to understand the functionality of their resources. Resources are defined by their usage.
- The resource base of the firm is continuously subject tot the processes of resource creation and decay
- Acquiring competitive advantage in a resources market is not possible in the absence of asymmetric information and/or co specialized resources with which you are going to augment the new resources

We assume that FM researchers adhere to most of these insights and are even happier when RBV theorists acknowledge the neglect of resource functionality. FM studies and specifically the usability studies seem to fill this gap because they study buildings and their effects from the perspective of the

built environment specialist (Alexander, 2008). Nevertheless, whether or not Newbert, Lockett, and others are on track in an empirical, methodological and philosophical sense is exactly the question one needs asking in the ongoing debate amongst experts.

FM studies might profit from the revival of attention for space and place studies in organizational and management sciences such as economy – inter alia the RBV approach - but also anthropology and geography. Usability studies (that focus in resources functionality, efficiency and effectiveness) should not just look at the building but at the complex interaction of all business resources and capabilities of the users. The claim that usability studies need more empirical attention could be worked out in a number of practical, theoretical and business relevant directions. What are the facts and figures of important and common KPI's like energy consumption and CO2 reduction? What is the impact of the use of the building and user behaviour? How can we create common and unambiguous output indicators taking into account that firms are heterogeneous? Which kinds of studies are needed to describe and explain the heterogeneity of resources and the subsequent (lack of) perceived added value?

Finally we may conclude that the contributions to EFMC 2009 and earlier conferences and views of people involved in the FM field produce a sheer diversity of topics that are worth to investigate. This indicates that the FM research agenda for the coming years will be highly differentiated. At the same time some priorities come across. Among the highest priorities fare the impact of FM on organisational performance, corporate social responsibility, the true meaning of sustainability and its relation with customers' needs and behaviour, and the role of FM training programmes when it comes to exploring and developing relevant social issues. An interesting challenge awaits EuroFM and the Research Network to identify national and international organisations that can implement this research agenda and to facilitate international co-operation. An important way of steering the research agenda is a clear agenda setting for EFMC 2010 and beyond. Hopefully the discussions in the Research Symposium and in the plenary sessions with the Research Symposium participants and participants of the Business Conference will help to find a limited number of issues that will be shared in a longitudinal research program in depth. Reflective capabilities therein need to be further advanced; a long-term approach seems the way forward.

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Appendix: International input from EFMC 2009 Research Symposium papers

This section presents the copied paragraphs on intentions of papers and considerations with regard to the future FM agenda. In order to develop our own thoughts for reflection, we analysed the research papers on shared challenges and underlying worldviews.

PRACTICAL POST-MODERNISM: FM AND SOCIALLY CONSTRUCTED REALITIES - Ilfryn Price, Ian Ellison and Rachel Macdonald; Facilities Management Graduate Centre, Sheffield Business School, UK

The authors argue that strategic FM should not engage with elaborate structural functional models of building service supply but with the socially constructed realities of organisations and their result. In brief its arguments are:

1. What differentiates, or should differentiate, FM from say building service provision is a concern for organisational purpose.
2. Organisations are, as the branch of organisational theory broadly captured as postmodernism has evidenced, social constructs although we subscribe to an, ontologically real, ecological interpretation of the same phenomena.
3. It follows that the research agenda for FM should include engagement with organisational discourses or narratives: conversations in a particular sense of the word that we will explain.

From the theoretical stance developed here new terms ('memes') compete to gain credence and usage in more general organisational conversation. FM is no exception. Around the turn of the millennium several other terms such as CREM or Infrastructure Management were being advocated as conveying something more strategic, less none core, than "merely managing the facility". Nowadays that trend seems to have diminished, but it has not gone away and UK policy guidance still gives priority to Asset Management as being where the big bucks are.

Research Agenda

FM has managed to embrace all Nutt's (2000) four trails, but is still vulnerable to Grimshaw's (2003) operational paradox. There may be three alternative trails or conversations for FM research. Firstly it could retreat to post modern theory – critical intellectual commentary - without engaging with moving practice forward. Secondly it could continue to scabble for crumbs from the table of practice. Models, theories and standards can result that may move building services engineering or maintenance practice forward, but FM as a whole will remain in a conversation for confirmation of non core status. A third trail, whether we label it evidence based or business critical will seek to engage with the cutting edge of practice and take the majority forward. Understanding the role and power of conversations to organisations and changing the physical reality in which those conversations occur should be part of such an agenda. It is a route to real, sector specific differences in what Facilities Management can deliver. What, in other words, is possible? In addition, to cite the helpful summary of an anonymous reviewer "understanding the power of conversations to organizations and the changing physical reality in which those conversations occur should be important perspectives for the forthcoming research agenda".

THEORETICAL MODEL DEMONSTRATING THE VALUE ADDING CONTRIBUTION OF FACILITIES MANAGEMENT - Per Anker Jensen Centre of Facilities Management – Realdania Research Technical University of Denmark

The purpose of this paper is to present a conceptual framework - the FM Value Map - to understand and explain the different ways that FM can add value to a core business, and possibly to the surroundings. The research presented in this paper is planned to be continued in a new project at the Centre for Facilities Management – Realdania Research at the Technical University of Denmark. The project "FM Processes and Added Value" will include a master thesis and a PhD-study. The project will relate the external effects of FM with the internal processes. It is also planned to carry out a joint EuroFM research project on "The Added Value of FM" under the Research Network Group, in order to bring together researchers from different research environments who are engaged or interested in comparing and developing joint research activities on the added value of FM.

The project will result in a EuroFM research publication. It is not necessarily the purpose to develop a common framework for studying the topic, but the project will bring together information about the different frameworks, which are applied, and investigate common grounds, reasons for differences, and possibilities for joint developments. The project participants will include researchers from Austria, Denmark, Finland, the Netherlands, Switzerland and UK.

Research agenda

Based on these new activities the topic of the added value of FM should be an essential part of the EuroFM research agenda for the coming years.

DO INNOVATIVE WORKPLACE CONCEPTS WORK FOR PSYCHIATRIC CLINICS? - Kirstin Arge, Sintef Byggforsk, Norway

This paper presents the results of a post-occupancy evaluation (POE) of a new workplace concept for an out-patients psychiatric clinic for children and youth, with shared office space and rooms for treatment. The purpose of the paper is to highlight the need for research based practice and post-occupancy evaluations of buildings in use. Research has shown that innovative workplace concepts are supportive to collaboration, communication, knowledge exchange and co-learning in work, but are not supportive to individual concentration work. Despite this fact business practice proceeds to design and implement workplace concepts that are predominantly focussed on collaborative practises. Research based practice seems to be scarce in real estate and facilities management. Post-occupancy evaluations informing programming and design processes are scarce as well

Research agenda

There is a need for research and development comparing the effectiveness and efficiency of different workplace concepts, including cellular office concepts. A user-oriented approach addressing Vischer's (2008) three levels of comfort, physical, functional and psychological may be useful. Until research and post-occupancy evaluations become an integrated part of practice, workplace concepts and buildings will continue to provide users with less physical, functional and psychological comfort than is necessary.

USABILITY EVALUATION OF BUILDING PORTFOLIOS - Anne Kathrine Larssen, Norwegian University of Science and Technology and Multiconsult AS, OSLO

The objective of this paper is to contribute to the further development of theories and efficient methods for evaluating the effect of buildings on organizational effectiveness and the achievement of goals, primarily on a portfolio level.

Research agenda

The approach for further research will be a closer study of typical objectives, activities and needs of different main organizational units in hospitals, in order to find more specific parameters. A challenge will be to identify the most important parameters for usability appraisal of hospitals, to find a reasonable balance between generic and context dependent ones, and a proper level of detailing. Furthermore we need to consider if and how the perspective of clinical pathways can be incorporated. It could be an advantage to be more specific about the consequences of poor scores in usability in the presentation of results. What are the kind of consequences, what is the extent? Can the hospital live with the consequences or not? More specific information about cause and consequences will be useful for making priorities and identifying the need for further analysis.

ENHANCING SERVICE PERFORMANCE AT REMOTE DESTINATIONS - Dietmar Wiegand, Štefan Emrich; Vienna University of Technology, Vienna, Austria

This paper presents the results of a study concerning the possibility to use a combination of existing methods for the optimization of work schedules and driving times for the delivery of FM-services to a widespread branch network.

Research agenda

The presented approach for the optimization of the workflow- and workforce-management and the routing of facility service providers is within the intersection of two main research roads of facility management. One road, which mainly occupied us during the last 20 years, is improving the efficiency of FM and facility services performance, i.e. improving the contribution of FM research to the core business of clients and improving the business performance of the FM companies. The second road, which will keep us more and more engaged during the next 20 years, is the contribution of FM research to solve the problems of society i.e. humanity e.g. the climate change, the increase of disparity between urban agglomerations and rural areas, and the aging society in the developed countries. New methods for enhanced mobile services might contribute to the reduction of carbon emission, and reduce the effort and the costs for the maintenance of infrastructure in rural areas. The presented methods for enhanced mobile technical services might also be adapted to social services dealing with an aging society in the developed countries. In any case facility management will remain a discipline, which is not a science itself, but applies findings of “supporting” sciences – in our case of mathematics and operation research.

INDUSTRIAL SPACES AND PLACES - Anna-Liisa Lindholm, Suvi Nenonen, Helsinki University of Technology. Finland

The object of this paper is to identify and discuss the main differences between industrial and office facilities and to identify those characteristics of the production and service companies that mostly affect real estate and facilities decisions and practices. The paper aims to gain more understanding on the industrial space as the research object and identify the potential future research agendas.

Research agenda

The table below summarizes the existing and future perspectives for research about industrial spaces.

Previous and current perspectives	Future perspectives
Ergonomics Health and safety	
Evolution of corporate real estate management as support function	Integrated support resources management Strategic approach Attractive workplaces
Computer aided processes for managing premises	Digitalized process in industry and support functions – new requirements for environments and processes
Energy efficiency, waste management	Corporate social responsibility
Obsolete industrial properties	Buildings for people, attractive workplaces, transparent industrial processes
Urban development	Community planning
Refurbishment	Mixed use and flexibility

There is a need to indicate the added value of facilities management and corporate real estate management to core business. The perspective can be widening towards more integrated support functions and strategic approach. Clarification of facilities management processes in European level has been started but implications to industrial sector are needed. The workplace management and workplace design of attractive workplaces could be an inspiration for new kind of thinking of industrial places. Interesting questions are: How to adapt workplace management of physical and digital workplaces to industrial sector in order to create more attractive work environments?

More frameworks and methods to develop industrial facilities in sustainable way from perspectives of environmental, social and economic responsibility are needed. Finally methods and scenarios for mixed use and flexibility are needed. The unused resource and innovations connected to multiuse of existing industrial facilities are challenging. This research agenda can provide a roadmap for managing the industrial places and changes differently than now.

The Purpose of this paper is to investigate the relationship between office satisfaction and individual performance conceptually and empirically.

Research agenda

In order to establish a model of workplace effects and corresponding workplace management policies, theory-based measurements will gain in importance. "Studies that measure outcomes such as user satisfaction ipso facto pronounce on building quality: users feel positive about good-quality built space, whereas if they are 'dissatisfied' the place under study is not performing or has somehow failed. An effective user-centred theory needs to be clear about what is being measured when users are asked about their experience of the built environment." (Vischer, 2008 p. 235).

Research in FM may benefit from a more rigorous approach to measuring theoretical core concepts. This is a necessary condition for the development of valid models of workplace effects and relations that allow for appropriate generalisations. Such models are needed for further development of FM as a scientific and practical discipline. In order to reach this goal, research projects with truly interdisciplinary teams with building specialists and social scientists have to be built. In the light of the findings presented here, comparative analyses of office workplaces and office buildings can be considered a promising approach. In order to assess the relevant parameters, heterogeneity between European office cultures (cf. Van Meel *et al.*, 2006) could be used as an opportunity for research.

MANAGING SUSTAINABLE PERFORMANCE IN FACILITIES - Anne Tolman, Tommi Parkkila VTT Technical Research Centre of Finland. Oulu Finland.

The paper is aimed at presenting the needs to monitor building performance and a description of tools for that purpose. The need arises mainly from the necessity to observe compliance, and to provide consistent performance to the clients of the spaces. As the future scenario for construction industry and facility management is that increasingly more the clients are actually purchasing the performance of the structures instead of the physical means for providing it, the material matters may rest with the contracting constructor for at least a definite period of time. The decision making of the operation phase then becomes an integrated part of the initial design and construction. This opens a new perspective for overall optimal life time management, and need of data from operation phase is emphasised. Furthermore, so far as the period of contracting has been limited to the duration of the construction process, the time dependant variations have been rather irrelevant. However, when operation period is taken under consideration, the changes on circumstances became more critical. This put more emphasis for the facility management to get accurate and timely information on the actual performance issues.

Research agenda

PBB evaluations can and should be performed in a routine manner. In practice, evaluations are often made only as part of commissioning or shortly thereafter, or when there is a problem. In order for any measurement and evaluation to be truly meaningful, they should refer to explicit requirement levels against which they can be judged. The performance of a building has some physical factors that serve as principle indicators. For condition monitoring, temperature and humidity are key indicators, which are also major factors for performance evaluation. In the use phase, maintenance and energy consumption are the main cost components, and directly relate to user comfort and services. All these items can be objectively evaluated by sensor data. This requires proper sensors and measurement techniques. The emerging enabling technology will direct changes in the near future to include building occupants in control loops via information and distributed interfaces, to achieve demand responsive electricity management in buildings, to integrate building automation and information systems and by all this, empower the facility management with a powerful tool.

STRATEGIC FACILITIES MANAGEMENT: A MOVE TOWARDS A SUSTAINABLE LIFE CYCLE BASED MODEL IN A DEVELOPING COUNTRY - F.O. Adejumo, Y.A. Adewunmi and M.M. Omirin. Department of Estate Management, Faculty of Environmental Sciences, University of Lagos, Akoka, Yaba, Nigeria.

This paper examines the current level of strategic FM thinking in a developing market and highlights training areas and pragmatic methods of sustainable life cycle costing needed to solve localized issues with the use of global knowledge.

Research agenda

A strategic approach to FM and the use of life cycle costing is important in realizing organizations' goals. Globally there are new requirements for sustainable life cycle planning and management. Hence there is the need to develop the knowledge base in this area in theory and in practice. With the advent of globalization of professional practices, the developments that brought these requirements in advanced countries are at the door step of developing markets. Peculiar conditions in Nigeria and other developing countries make it imperative that appropriate models will be developed that take into consideration the challenges of operating within the local environment. This calls for further research into the use of LCC and reactions of practitioners to the lack of database, their non-usage of LCC in decision making, non consideration of long term implications of firms' decisions and risk evaluation. Also, there is need to ascertain the reasons why the strategic component was not emphasized in the use of life cycle costing.

RISKS AND CONTROLS IN FACILITY MANAGEMENT PROCESSES DURING THE REAL ESTATE UTILIZATION PHASE - Johannes Bockstefl, Alexander Redlein Vienna University of Technology, Center for Information and Facility Management (IFM), Austria

The purpose of this paper is to provide a methodology for facility managers in order to identify and tackle possible business risks during the real estate utilization phase. The paper documents the current status of the authors' research.

Research agenda

Reference processes in facility management and managing risks and controls within these processes are an important topic for the FM research and action agenda 2015. The range of reference process models already developed should be enlarged and the existing process models should be detailed and further validated. Furthermore, the reference process models should be extended by valid risk and control tables as described in the paper. In addition, a validation of possible control activities regarding their efficiency in simulation and reality is an interesting topic for further research.

STRATEGIC SPACE OPTIMIZATION BY AN INNOVATIVE IT TECHNOLOGY - Michael May, University of Applied Sciences Berlin, Germany

The purpose of this paper is to present a new methodology to optimize the space utilization in large organizations in a highly automated manner. Space allocation is a tedious work and great challenge for the FM with considerable economic impact on the entire organization. The inherent mathematical problem in the task is the Quadratic Assignment Problem known as one of the most intricate discrete mathematical problems. To date, there are no known algorithms that solve these kinds of optimization problems in an efficient way. The paper presents a novel approach towards automating this difficult assignment process and its application to real world examples.

Research agenda

As a major contribution of this research to the future European research agenda in FM the authors stress the necessary revolution of current IT based information systems in FM to real decision support systems especially from a strategic viewpoint. This requires a serious effort in generating new models, mathematical algorithms and IT technologies which are already in place in other industries like microelectronics and manufacturing. Also a new quality of data management and systems integration in FM is necessary.

THE IMPACT OF SPATIAL LOCATION ON SOCIAL POSITION – A CASE STUDY OF A FINNISH COMPANY'S REGIONAL OFFICE - Nils Gersberg, Suvi Nenonen Helsinki University of Technology, Helsinki Finland

Anecdotal evidence holds that the spatial work environment affects organizational performance both positively and negatively. The present study tries to overcome this shortcoming in evidence by investigating the relationship between the physical work environment and the social (i.e. collaborative) interaction in a knowledge work setting.

Research agenda

The contribution of this research to the future research agenda lies primarily in its exploration of the combination of visual graph analysis measures with those of social networks. However, more research is needed to verify the compatibility and explanatory power of the combination of those two methods for research concerned with the physical and the social spaces in office buildings. With regard to business practice the outcome of the current and similar studies has the possibility to analyse a given space with regard to the 'fit' with the informal organizational structure. Office designs thus could either be tailored to a specific social structure of an organization, or, as the extension to this study will attempt to research, potentially be used to actively shape and alter existing social structures through the imposition of a specific physical environment.

THE KNOWLEDGE WORKPLACE – SEARCHING FOR DATA ON USE OF OPEN PLAN OFFICES - Siri Hunnes Blakstad, Norwegian University of Science and Technology, Morten Hatling, Arne Lindseth Bygdås, SINTEF Technology and Society

Both management and workplace-literature suggest that companies can use office design and information and communication technologies as tools for strategic development. The main goal is to give better support to their core work-processes to enhance performance. Even though normative knowledge and theories about office design advocate that open plan offices enhance learning and knowledge sharing, the evidence of this has so far been limited and anecdotal, with relatively little empirical evidence. In the research and development project "The Knowledge Workplace" 2003- 2006 the authors and their research team worked with almost 20 Norwegian companies to develop methods for workplace design, with focus on organizational development, knowledge production, and knowledge sharing. This paper presents some of the findings from the surveys and interviews.

Research agenda

The presented study suggests that more open offices support collective work on expense of individual self-assessed productivity. But the study did not enable a more nuanced description of workplace typologies or to access the spatial and functional quality of the workplace as such. The study includes only knowledge workers in open plan offices. They have all been through a relocation which involved discussions about use and practise in the new office. More data are needed to provide a deeper understanding of the relation between work and place. For the future research agenda, the authors suggest empirical studies of knowledge workers in a variety of office layouts, combined with a nuanced classification of the different office layouts and organizational contexts, as well as description of work-styles and work-processes. These studies should combine both qualitative and quantitative methods, and investigate individual as well as collective measures of performance. Only in this way FM research may succeed in establishing more solid evidence of the workplace as enabler and disabler of knowledge work performance.

ECONOMIC EFFECTIVE IMPLEMENTATION OF FM – Friedrich Sustr, Alexander Redlein, IFM/Vienna University of Technology, Austria

This study investigates the question how far facility management is able to improve the performance of a company and to reduce the costs for the use of the building. Is this affect measurable and is the facility management the right tool, as the other used common business tools? The hypothesis is to get a general approach of all cited results concerning the saving in connection of the use of a Facility Management Department. The focus is on corporate affiliation, age of employee an years of experience in FM profession. The data collected could neither prove nor disprove the hypothesis

Research agenda

The second phase of this study will include a qualitative extended ex post office analysis of the existing profit statements and balance sheets. This should provide more detailed data. Additional expert interviews will also take place and hypotheses will be established. The third part – the questionnaire 2008 – will be used to validate the hypotheses. New statistical models describing the influence of parameters on the efficiency of FM will be created. Parallel to this research in the Austrian FM Market, the IFM Institute has done the same standardized questionnaires in Germany, Bulgaria, and Turkey. Several additional contacts have been established to bilateral cooperation for using this standardized questionnaire. All countries will be invited for cooperation.

TOWARDS IMPROVING ENERGY-EFFICIENCY IN OFFICE BUILDINGS; A CASE STUDY ON THE AFFECTS OF TECHNICAL OPTIMIZATION AND AUGMENTED USER-SOPHISTICATION - Pieter C. Le Roux and Karel Dekker, Center for People and Buildings Delft, Netherlands

The study aimed to determine the effectiveness of various predefined measures and scenario developments in ensuring greater energy-efficiency of existing office buildings including the effects of user-involvement. The combined positive effects of technical measures and user-sophistication on reducing energy consumption in existing buildings provide an evidence-based management approach to the formulation and implementation of measures to improve the energy-efficiency of entire property portfolios.

Research agenda

The reciprocity between optimized technical building management and control systems and user-behaviour has been undeniably proved by this study. However, the effects of energy saving packages, anticipated scenario developments and augmented user sophistication through influence on user behaviour are highly case-specific. Generalization of the simulated effects for a specific combination of building characteristics and user-sophistication may not be applicable to different environments and user-group. The quantified evidence resulting from this study supports the need for considering the role of user-involvement in reducing energy consumption in buildings, while simultaneously emphasizing the need for further research in this field.

ALTERNATIVE WORKPLACE PROGRAMS – A MAPPING OF THE CURRENT STATE - Nils Gersberg, Helsinki University of Technology, Finland; Joe Aki Ouye, New Ways of Working Network, USA and Suvi Nenonen, Helsinki University of Technology, Finland

Facility Managers constantly strive to enhance the efficiency of their contribution to the core business. Alternative workplace programs as a means to this end have been a hot topic among Facility Managers for quite some time. However, there is no assessment of the current situation of deployed alternative workplace solutions. This study investigates the current state of alternative workplace programs among 32 companies from the USA, Finland and Germany. The results remind us that alternative workplace programs are complex. They are not just about space but about changing how and where we work i.e. "a new order of things". The very complex system of management approaches, work practices and activities, technology tools, and places must be changed symbiotically and some of them are very resistant to change.

Research agenda

Future research around alternative workplace programs could focus on gathering more information about the best practice cases: what is done, how and which were the critical success factors in large alternative workplace programs? The role models are needed and the approach is multidisciplinary. The interesting perspective is also to conduct a follow up study based on the survey presented in the paper. The benchmarking data gathered annually is providing perspectives that are of interest both for the industry and science.

This study is focusing on shopping centres usability by exploring how tenant companies as users perceive the usability of their workplaces in the shopping center. Although the issues raised here are already acknowledged in international concepts they are relatively new in Finnish cultural environment because the phenomena of shopping centres are somewhat new in Finnish consuming culture. The surveys produced specific knowledge about the user needs and perceptions of the usability, not the actual concrete usability measurements. Actual data about detailed touch points, such as the doors, air, headways etc., should be gathered. The knowledge of this research can be used in developing a tool for rating the usability of a workplace in a shopping centre and working further with qualitative methods.

Research agenda

A shopping centre is somehow comparable with multitenant office building. The social, physical and virtual structure of a shopping centre is complex with a variety of user groups and different demands. There is a need for a structural approach to understand the different user groups. This is a challenge for usability of workplaces research in general: what are the methods to capture the information needed from all different user groups and how to apply this information both in design and use phase of the building? Whereas the consumer has a key role in shopping centre business, the shopping centre management has to help tenant organisations to serve their customers in the best possible way. The future research agenda should include comparisons between economical effectiveness and usability of the shopping centre in order to indicate the value adding elements of usable places. Additionally the perspective of shopping centres, usability and areal development needs to be investigated more. The challenge is to link this research to sustainable development trends, policies and protocols.