Facility Management as a digital change agent

What you need to know about the transformation of FM in the digital age.

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Contents

SVEND BIE, Director of DFM network

Preface

Digitization presents facility management (FM) with huge challenges but even greater opportunities, which is the essential message of this White Paper on Structured Digitization in FM.

One challenge is that FM consists of a very broad task portfolio, which makes it difficult to accommodate everything within the building portfolio – from office interior, canteen, reception to indoor climate – on a single digital platform. This is further complicated because digitization requires standardized work processes to be extremely carefully planned and described.

Conversely, digitization with big data, the Internet of Things (IoT), robotics, etc. gives FM fantastic opportunities to become more strategically integrated with the core business and the potential to both develop and document its share of the company's total value creation.

It was for these reasons that the DFM network in the spring of 2017 set up a digitization committee, which quickly concluded that FM is doubly affected by digitization:

'We must both see the opportunities and the challenges that digitalisation provides within the FM's field of work and we must understand the changes digitization creates in the core business. What happens to our core business can vary in severity, but for the vast majority of people, over a number of years, the transformation is so great that it also changes the success criteria for FM.'

Our work is based on the five classic FM fingers[1] but with an additional chapter on sustainability, rather than integrating it into the individual chapters.

The five classic FM fingers:
- The right buildings in the right places – building portfolio
- The right use of facilities and buildings – space management
- The right operation and maintenance
- The right organizational service
- The right management, organization and business model

DFM network's digitization committee consists of Kim Jacobsen (chairman), K Jacobsen Ltd., Trine Thorn, Nordea, Poul Ebbesen, Rambøll, Ulrik Mathisen, Tivoli, Mads Ubbe Beier, Compass Group, Nikolai Randal Petersen, RegionH, Mogens B. Andersen, DAB, and Svend Bie, DFM network.

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DFM Network's digitization project includes – in addition to this White Paper – both conferences, member meetings, and experience networking, all of which can be found online. The whole project is financially supported by Realdania.

1 The five classic FM fingers are described in the "Facilities Management Manual" by Per Anker Jensen

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Strategic management of structured digitalisation in FM

Introduction

During the last two to three decades, most parts of the FM business areas have experienced an increase in the use of Information Technology. Initially the digitalisation process was mainly driven by enthusiasts and 'first movers', who, on the operational and tactical levels, saw potentials in supporting specific FM work processes with the use of digital tools. Later, a layer of FM middle managers began supporting the digitalisation process, because they saw potentials for increasing efficiency and improving the output of FM work processes. Over the last decade, FM top managers and even core business top managers have seen strategic possibilities in digitalisation in FM. Top management has a specific focus on technologies generating management information for establishing future strategies. Although often only static management information is generated, because systems that can provide constantly updated management information are not established.

In parallel with the above described development, access to automatically collected data, e.g. with the use of sensors, has considerably improved. Many people in the FM

business are seeing future potential in using the large amount of data being collected to create additional value.

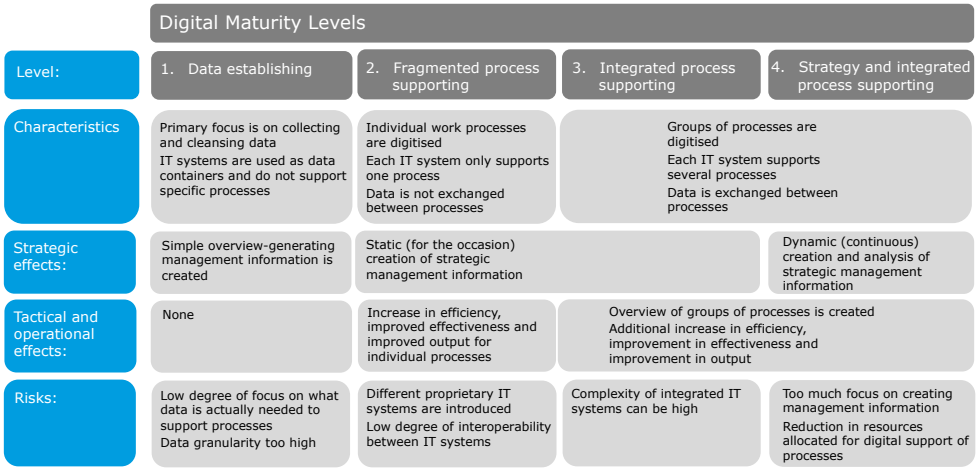
This chapter describes how digitalisation can be handled in a structured and value adding way, so that FM work processes and FM strategies can be supported in the best possible way. In addition, the different types of digital technologies that are used in FM are described. Finally, the fundamental considerations that the FM management should make, so that the digitalisation process can evolve in the best way possible, are explained. Initially the state of digitalisation in FM is described based on a proposed maturity model for digitalisation. The content in this chapter is based on the author's many years of experience with the implementation and use of IT in the FM business, and the author's research in this field.

Digital maturity levels

The digitalisation process in an FM organisation may be better understood when divided into the four steps, or levels, shown in Figure 1.

Most FM units in Denmark, in both public and private organisations, are on maturity level 1 or 2, which may deviate from the situation in other countries. Most municipalities, regions and government institutions in Denmark have, over the last two decades, tried to implement IT-systems on all maturity levels and for support of many different operational tasks, but the challenge has been larger than expected. The tendency now is that there is a focus on improving the digital maturity on the first level (data establishing). This is done due to an acknowledgement that the digitalisation process must be better governed, and that the digital basis must be structured and limited as much as possible. Attempts are also made to improve the digital maturity on the second level (fragmented process supporting) for specifically selected operational processes. Similar tendencies can be seen in the private sector, where the maturity level is more dependent on the core business area, as well as the external service providers, who often require the use of digital tools to support collaboration.

Figure 1. Digital maturity levels (columns) and their characteristics, their effects on the strategic, tactical and operational levels and, finally, their risks (rows).



In **Maturity level 1 (Data establishing)**, data for the digitalisation process is collected, cleansed and stored in different data containers, such as CAD, BIM, GIS and database systems. In particular, basic real estate property data and financial data are collected. Spreadsheets are often used to store data, which increases the risk of data redundancy. Granular or detailed data is often collected as well, which requires significant resources, and often there is a lack of focus on collecting data for support of specific work processes. At this maturity level, simple overview-generating management information can be created, such as lists or maps with information about the real estate portfolio or the different work processes.

Maturity level 2 (Fragmented process supporting) is characterised by isolated digitalisation of specific work processes. Often, IT systems (e.g. CAFM systems) are implemented to support specific operational work processes. In each IT system, proprietary file formats are often used, which complicates exchange of data between systems. This causes a low degree of interoperability. On this maturity level, occasionally and with a moderate effort, management information about specific operational work processes can be created. For the digitised operational processes, some increase in efficiency, improvement in effectiveness and improvement in output can be achieved.

Maturity level 3 (Integrated process supporting) is characterised by IT systems supporting groups of operational work processes, which are being implemented. Thereby, data can be better used across operational processes, which gives a high degree of interoperability. A basis for a coherent coordinating, planning and execution of different operational processes is created, which can create synergies between the processes. Further increases in efficiency, improvement in effectiveness and improvement in output can be achieved. The integrated IT systems (e.g. IWMS – Integrated Workplace Management Systems) are often complex, which can cause the implementation process to become quite resource-demanding.

Maturity level 4 (Strategic and integrated process supporting) differs from maturity level 3 in one important area, and that is when it comes to generating management information. In maturity level 4, management information is generated continuously. Often, investments are made in digital analysis tools, which can automatically generate standardised management information for strategic decision-making. At this maturity level, there is a risk that resources for continued improvements of digital support of operational processes are allocated to other purposes.

By using these **four digital maturity levels** to describe the degree of digitalisation of the FM organisation, a picture of the organisational maturity of the FM organisation is also created. Which management does not strive for digital maturity level 4, and thereby establish a permanent readiness for creating necessary management information, which can form the basis for strategic decisions?

IT strategic considerations

No matter the digital maturity level of your own FM organisation, you should, as an FM decision-maker, frequently ask yourself the following basic strategic IT questions:

1. Which FM processes should be supported digitally?
2. Which management information should be generated digitally?

The IT strategy should ensure that digitalisation supports work processes and ensure that organisational strategies are supported. Therefore, the two questions are crucial

for establishing an IT strategy for the FM organisation. Ways of clarifying the two questions are presented in the following section.

Clarifying which processes should be digitally supported

For each type of process (operational task), question 1 requires a deeper understanding of the current maturity level, as well as clarification of the potentials of moving up to a higher digital maturity level. Potentials mean a weighting between assessed effort (input) and yield. The effort is the expected investment in resources. Also, the expected time required must be considered. The yield can be assessed as increase in efficiency, improved effectiveness and output, and maybe most importantly, to what degree the organisational strategies are supported. The relationships between some of these yield-related dimensions are illustrated in Figure 8.

Often, digitalisation implies a movement away from autonomy (for instance, that similar tasks are performed differently among colleagues), and a movement toward uniformity (standardised work processes). Therefore, as a part of clarifying which processes should be digitally supported, a mapping of the present process activities is required. This mapping can show to what degree each of the operational processes is executed the same way in the organisation.

An important aspect is determining whether the specific operational task is expected to be handled by in-house employees or by external service providers. Often professional service providers have digitised their own work processes to maturity level 2 or 3. When engaging with service providers, collaboration between demand side and supply side is often supported by IT systems provided by the service provider. Therefore, when outsourcing service deliveries, it should be decided to what degree the digitalisation process can be left to the service provider. These issues are illustrated in Figure 5.

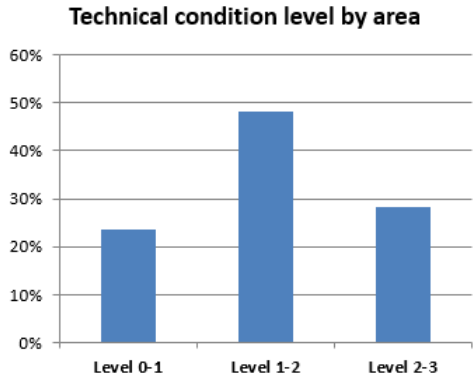
Clarifying which management information should be generated

Primarily, management information that can function as a basis for strategic decision-making should be generated. Within both FM and property portfolio manage-

ment (Real Estate), there is a need for information for strategic decision-making. As an example, organisations often demand information for establishing portfolio strategies. Another example can be a need for information for managing specific operational service deliveries. Often, accounting-related information is required, such as what the cost is for different operational tasks calculated as cost per square metre (cost/m2) or cost per full-time equivalent (cost/FTE). Also, there can be a need for information about the development of the condition of the property portfolio, or how users perceive the level of the services provided by the FM organisation. Digitalisation should ensure that strategic decisions can be made on an informed basis, that is, on information the digitalisation process ensures can be delivered. Strategic decision processes can, as an example, deal with the development of the property portfolio so that the objectives of the organisation can be reached.

Information that has value for management is characterised by being on an overall level compared to information that is valuable, when managing specific operational functions. Figure 2 shows examples of management information concerning conditions of facilities that are geographically spread. Such information can be based on data from IT systems used by the operational functions in the organisation.

Figure 2. Examples of data-based management information for strategic property decision-making

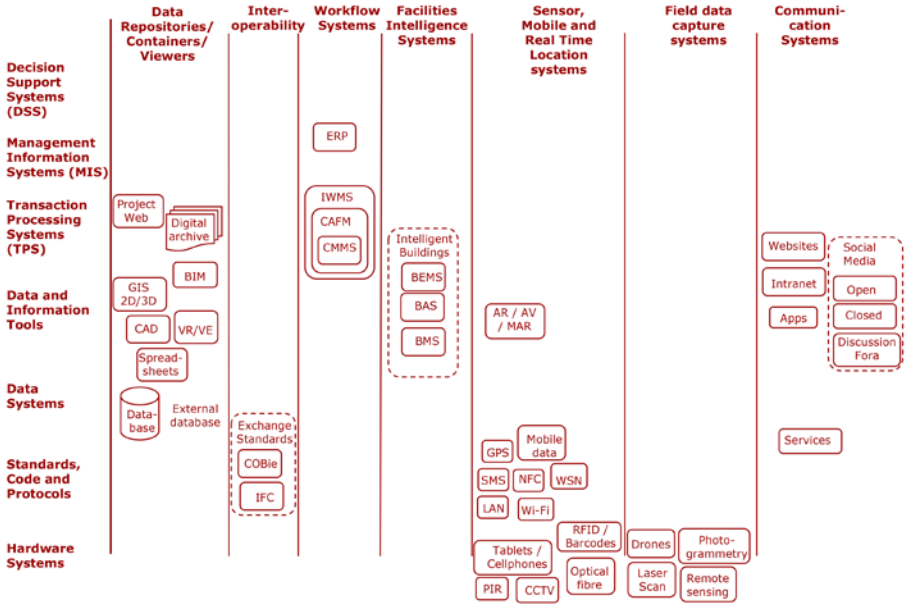


Technologies used in FM

Groups of technologies

A large variety of digital technologies are used for many different purposes in the FM and RE business area. In Figure 3, some of the most common of these technologies are grouped (columns) and ranked (vertical axis) according to the degree of information the technologies generate. The most information-generating technologies are found mainly at the top. Technologies for analysing data are mainly found in the middle. Finally, technologies used for creating, storing and exchanging data are found mainly at the bottom.

Figure 3. Groups of technologies (columns) used in FM and RE ranked according to information level (the most information-generating technologies are placed at the top)



Typology for technologies

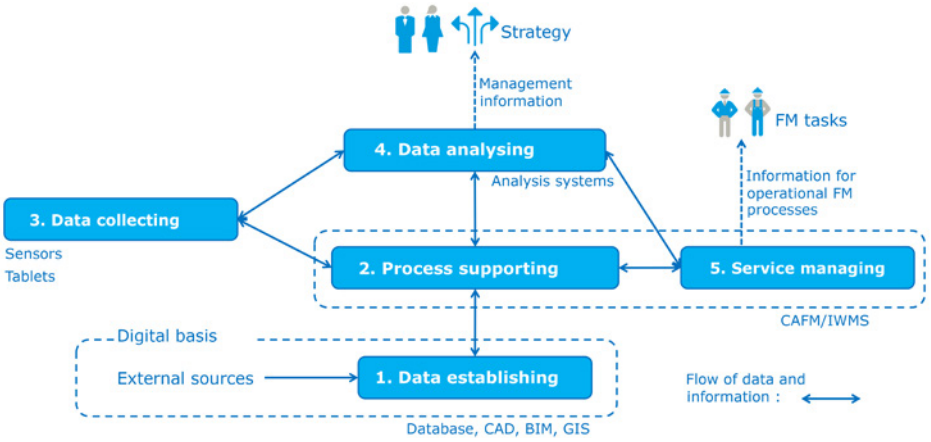
Rather than regarding digital technologies as specific pieces of software or hardware, as in Figure 3, technologies can be regarded as being divided into types based on use and purpose. Digital technologies used in FM can be divided into the five main types listed in Table 1.

Table 1. Proposed five main types of technologies based on use and purpose within FM

No.	Type name	Use and purpose
1	Data establishing	Technologies used to establish the digital basis that is the prerequisite for operating facilities using digital technologies
2	Process supporting	Technologies supporting specific operational-related work processes
3a	Use-data collecting	Technologies used to collect data about the use of facilities and for supporting the use of the facilities
3b	Building automation systems	Technologies used to monitor and control facilities
4	Data analysing	Technologies used to analyse collected data
5	Service managing	Technologies supporting service delivery relationships and management

These five (or six, if type 3 is split into 3a and 3b) technology types often overlap each other and, as illustrated in Figure 4 below, data is often exchanged between the technology types. Sensors used for collecting data about use of facilities belong, as a starting point, to type 3. Data from the sensors can be used in software that supports efforts to optimise a specific operational process. This software belongs to type 2 and can at the same time belong to type 5. This IT system, consisting of both sensors and software etc., thus includes more than one of the technology types. The flow of data and information between the five technology types is illustrated in Figure 4. In addition, the figure shows some of the software and hardware systems that typically belong to the different types of technology.

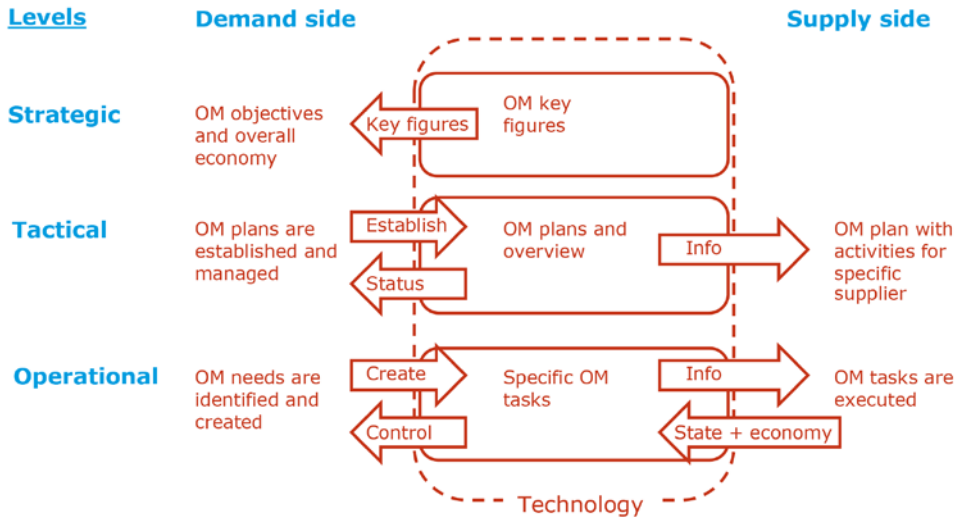
Figure 4. Flow of data and information between different types of technologies



The digital basis shown at the bottom of Figure 4 is collected by use of data establishing technologies (type 1) and can contain data from both external sources, such as official property data and utility data from utility companies, and data created internally in the FM organisation.

The service management technologies (Type 5) are suitable for supporting and strengthening the collaboration between the FM unit and the service providers, and for strengthening the collaboration between the FM unit and the users of the facilities. Figure 5 below shows how the demand side (left side) and the supply side (right side) can exchange data and information at all three levels (strategic, tactical and operational) by using technology. An example may be a CAFM system used for exchange of maintenance data between the operational level of an FM organisation (demand side) and a supplier of maintenance services (supply side). On the operational level, the supplier can use the system to report when a maintenance activity has been performed. On the tactical level, the person in charge of maintenance in the FM organisation (demand side) may use the system to plan and report to the supplier which maintenance activities are to be carried out the coming year. And finally, on the strategic level, management (demand side), based on maintenance data from previous years, can set up a maintenance strategy for the coming years.

Figure 5. Technology as a tool for collaboration between demand and supply side

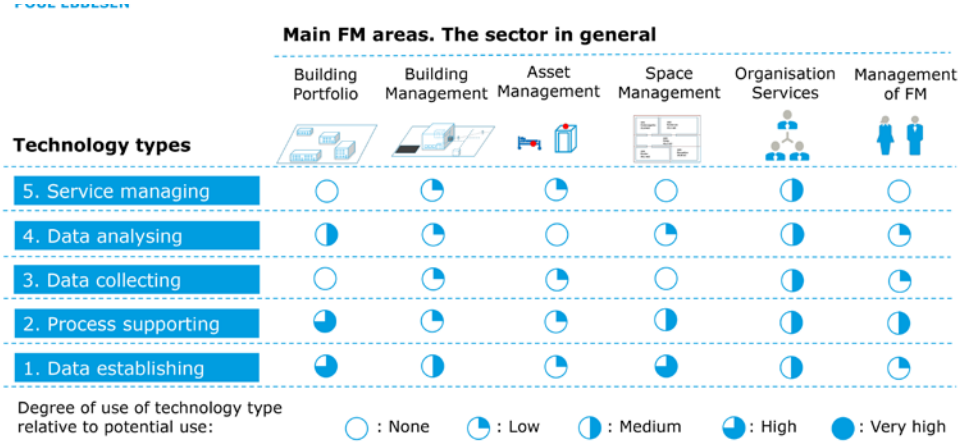


Use of technology types in main FM areas

Within the various areas/disciplines of FM and RE, the digitalisation process progresses at different speeds. Even within the same organisation, the degree of digitalisation can vary widely between FM areas. The difference is due, inter alia, to the FM areas' different framework conditions, management awareness, way of organisation and competence levels. In addition, the differences are due to the fact that the different digital technologies have been introduced at different times in the market and that they are not equally developed and tested.

Figure 6 below shows an assessment of the degree of use of the various technology types within the main FM areas; Building Portfolio (Real Estate), Building Management, Asset Management, Space Management, Organisation Services and Management of FM. The assessment does not reflect the situation in a specific company or organisation, but is an assessment of the Danish FM sector. The shown degree of technology type usage is relative to potential use.

Figure 6. Main FM areas and degree of use of different technology types



Building portfolio (Real Estate)

A significant part of the digital basis used for management of building portfolios, also called Real Estate, is made available by the state and municipalities as property and geodata. This explains the high degree of use of data etablishing technologies and process supporting technologies, often based on GIS. Analysis of property portfolios and information used for property strategies is also often based on moderately accessible publicly supplied property and geodata, which explains the moderate use of data analysing technologies in the area.

Building Management and Asset Management

Building management covers many operating tasks with often different digital basis. A special area of building management is the handling of inventory and other assets, often referred to as Asset Management. Building Management is often characterised by organisational silos, each using proprietary software systems and data formats. Within certain types of operational tasks, e.g. cleaning, error handling and maintenance, a digital basis has often been established, which both enables digital support of the operating task and enables analyses to be made that can generate management information. In some organisations, data-collecting technologies (type 3) such as sensor technology are used for delivery of data that can help streamlining operational tasks. Particularly within the asset management area, the use of labelling (e.g. with QR codes) is emerging and the use of sensor technology for locating and tracking

inventory and equipment is seen. Finally, some organisations have started to use CAFM systems to manage service deliveries such as maintenance of special equipment.

Space Management

Several years ago many FM organisations started their digitalisation process in the space management area, often using space management systems based on CAD. Despite the early start, these FM organisations often still struggle to establish a consistent and updated data basis, often due to constant building changes. For ad hoc use, analyses are sometimes performed and thereby force the FM organisation to momentarily update their digital basis.

Organisation Services

Servicing the organisation can, for example, include reception and postal and copy services. Central to organisational services is the user's perception of the service level. A distinction must be made between the decided or agreed service level, the actual service level and the user's perception of the service level. In the last decade, the use of digital technologies for gathering and analysing information about these service level dimensions has become commonplace in many companies. In addition, service deliveries are often managed by the use of digital tools.

Management of FM

Digital tools are used, in particular for planning and management of activities in the FM organisation. Management within the FM area is usually supported by the company's other support functions, including the finance function and the HR department. Often, the FM organisation's digital tools are not directly linked to the company's other digital tools, including the company's financial system and time-tracking system. This may cause uncertainty about the accuracy of resource data in the FM organisation, such as accounting data and time consumption data.

Fundamental digital considerations

Among other things, digitisation is about creating, storing, exchanging and using data by use of software and hardware in ways that generate usable information. Therefore,

as an FM decision-maker and as the person responsible for digitisation in an FM organisation, you should ask yourself the following fundamental questions:

1. Which data are required (which digital data basis must be established)?
2. Which digital technologies are required (what types of technologies must be implemented)?

These two questions can be best answered when the IT strategic questions, described earlier, have been answered. A clarification of the IT strategic questions will to some extent provide answers to the fundamental digital questions: which data and digital technologies you should use. The fundamental digital considerations are, of course, key to maturity level 1 "Data creating" (See Figure 1).

Clarification of which data is required

Establishment, storing and maintenance of the data basis (the digital foundation), is often the most resource-demanding part of digitisation. The exercise is, most of all, an exercise in limiting yourself. Only the most necessary data should be included. For example, is it necessary to store and maintain data on room level? Is it necessary to store information about all operational activities? Clarification of which data is required is mainly a question of which data structure best suits the FM organisation. Clarification of data structure is about which groups of data are required and about which relations must be established between these groups of data. The digital basis is illustrated in Figure 4 as both internal and external data sources.

Clarification of which digital technologies are required

A sensible choice of digital technologies depends, to a great extent, on the organisation's current digital maturity (see Figure 1). If the digital maturity is at level 1, it would often be most worthwhile to start by implement and routinise the use of data establishing technologies such as CAD, BIM and GIS, combined with a simple database for basic internal and external property data. Only when the use of these technologies becomes routine, and simple overview generating information can be created for the management, should one consider to implement process supporting technologies in the organisation (see Figure 4).

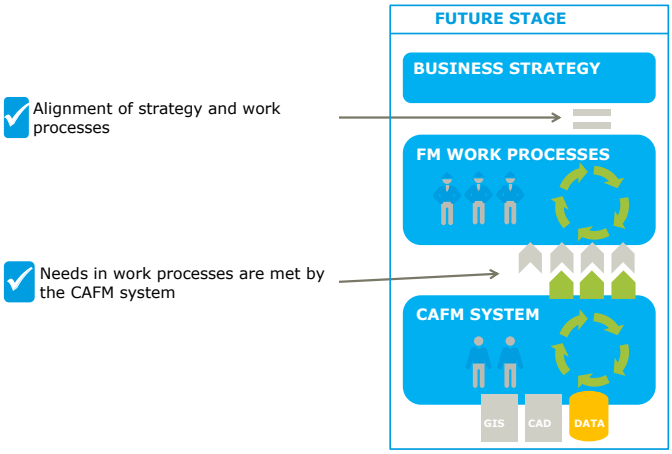
Value creation with digitisation

It can be argued that digitisation creates value when support of operational tasks is improved, management information is improved; and, of course, when productivity is improved and the effect of operational tasks is increased. Increased satisfaction among users of services also has value. Finally, strengthening cooperation e.g. between demand side and service providers is a value. The requirements for, and expectations to, the use of the digital technology should, however, be stipulated in the contractual basis between the parties.

Structure for technology supporting business processes

In fundamental terms, an information system, which is often based on one or more digital technologies, creates value when it supports one or more business processes. In a similar way, value is created when a business process is aligned with organisational strategies. This coherent structure or framework including information systems, e.g. a CAFM system, work processes, e.g. an FM work process and, finally, organisational strategies, is illustrated in Figure 7 as three connected layers. Note that an additional layer consisting of the core business work processes can be added between the FM work processes and the business strategy.

Figure 7. Information System – Business Process (IS-BP) framework for understanding how technology can support business processes and business strategy



Before a process supporting technology (bottom layer in Figure 7) is put into use, the desired work process (middle layer) should be mapped and the organisation adjusted to this process. One must be aware though that process supporting technology often dictates a specific work process. An alternative and tougher implementation strategy could be to force a specific work process through by simply introducing the technology.

Value parameters

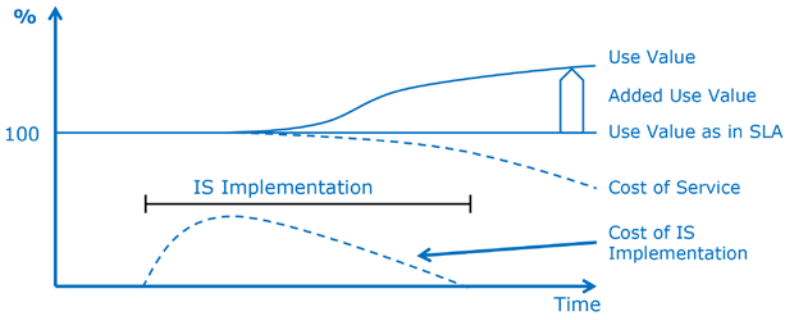
IT implementation can be justified with a business case with the calculation of Return on Investment (ROI), but when seen in isolation it only provides a one-sided picture of the effect and of the actual value added. What is the value, in the long term, of getting the investment back after a few years if, in the meantime, the FM work process is damaged; or if the FM work process is no longer aligned with the organisational strategy?

Let's look at an example where the management of a property investor has chosen a new strategy which implies that customers will be offered faster service by using smarter technological solutions. The objective is to better retain customers by increasing the customers' satisfaction with the service level. Thus, a strategic change has been chosen in the direction towards the use of smarter technology. On this basis, the OM department choose to introduce digital door locks and keys for the entire property portfolio. In this way, tenants of the property can have keys delivered quicker and have their keys and door locks reset faster.

In the example above, it may perhaps be difficult to demonstrate ROI, but as illustrated in Figure 8, in addition to actually supporting the new strategy, the investment can also increase the use value for the customers (which was the objective with the strategy). The investment may perhaps also result in a reduction in resources spent at the operational level on handling door locks and keys. In this way, more customers are satisfied and, on the operational level, resources are released for other purposes.

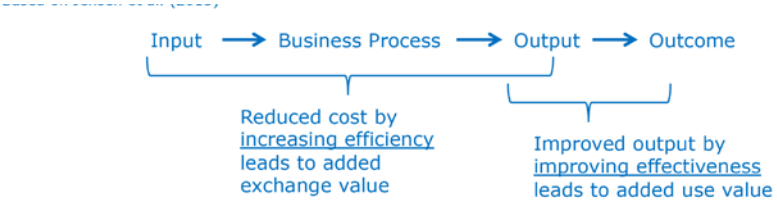
The resources spent on introducing the new locking systems, illustrated as the bulge-shaped curve at the bottom of Figure 8 must, of course, be offset against the achieved growth of value (achieved benefits).

Figure 8. Idealised development of use value and cost when investing in technology



Value created as a result of introducing digital tools can be better understood by using the process model shown in Figure 9. For example, it can be perceived as increased value if efficiency is increased, which means that a reduction in the use of resources has occurred without a simultaneous reduction in the volume of what is delivered. It can also be perceived as increased value if the effect of the output of the service is improved.

Figure 9. Process-related concepts and the value parameters of efficiency and effectiveness



If a growth in value, caused by IT implementation, is to be documented then it normally requires that the conditions before (current stage) and the conditions after (future stage) are monitored and reported. If, for example, a growth in value is expected in the form of more satisfied customers, then a survey among the customers before and after the introduction of the technology would be relevant. The survey questions must be the same before and after the introduction of the technology.

Interoperability

An essential value parameter is interoperability, which is basically about the possibility to exchange data between systems. Improved interoperability can be perceived as an improvement in efficiency. Not all digitisation processes, however, lead to improved interoperability. Interoperability is the basis for integrating IT systems.

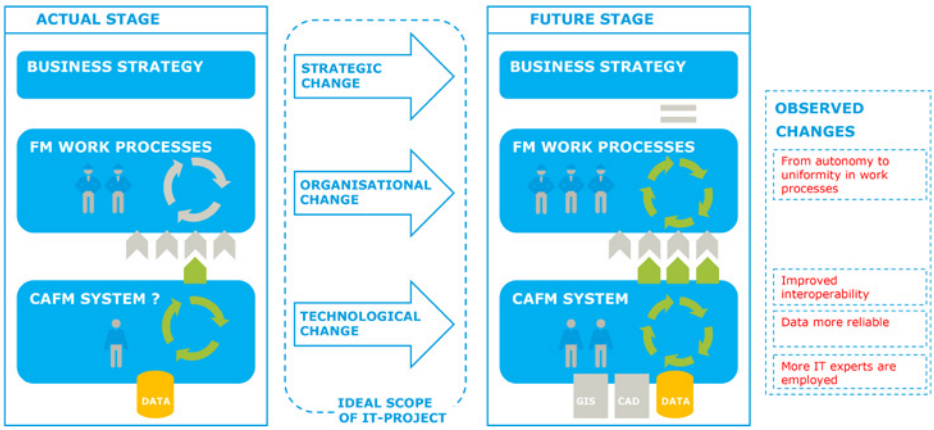
The digitalisation process

Changes occurring because of IT implementation

All digitisation (often called IT implementation) leads to changes in an organisation. Figure 10 shows how IT implementation can lead to strategic, organisational and technological changes.

Parts of the change in an IT implementation process can be contained in an IT project. Often, only the technological change is included in the IT project, but ideally, all change elements should be included in IT projects, the technological and organisational changes as a minimum. The scope and content of IT projects should be clarified before the actual IT project commences. In Figure 10 below, all parts are included in the scope, which, however, is rarely the case.

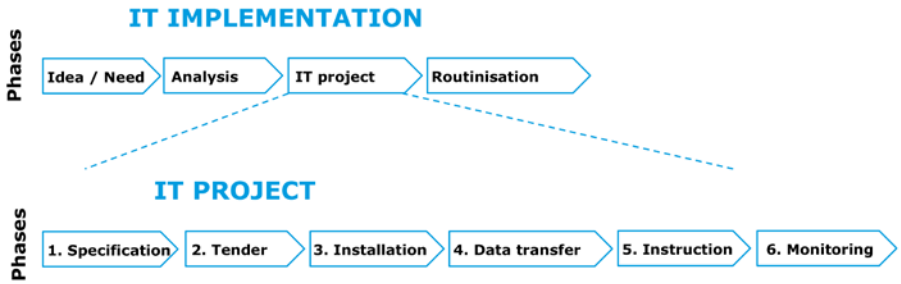
Figure 10. The IS-BS Framework used to illustrate the change process in IT implementation processes. Ideal scope of the IT project is also illustrated. Finally, some typical observed changes are shown.



Structured implementation

Implementation of technology can be planned and managed in many ways. If the IT implementation includes larger investments or greater changes in the organisation the IT implementation should be planned and managed relatively carefully. Figure 11 shows the typical phases in an IT implementation process. The top row of phases covers the entire process; starting with the idea and need being shaped and ending when the IT system has become routine in the organisation. The bottom row shows the phases that are often included in managed IT projects. An important phase, which is shown in the top row, is the analysis phase, where the possible added value, which the IT system can contribute to, is investigated. Note that phases that are included in the strategic and organisational changes (see Figure 10) are not included in Figure 11.

Figure 11. Typical phases in IT implementation and typical phases in an IT project



Digitisation should be managed, but one must be aware that digitisation is often driven ahead by different so-called 'drivers', which can be used advantageously. A driver for digitisation can be management's need for data-based management information. Other drivers are FM colleagues' desires to streamline planning, management and monitoring of operational tasks. A driver is also an increased demand for streamlining of service deliveries and demand for transparency in the service delivery. Finally, increased digital competencies among employees is, in itself, a driver. Drivers can be exploited and used to push digitalisation in the desired direction.

Competences and other resources

Introduction and use of digital tools requires special skills among employees intended to use the digital tools, but also among employees whose work processes are supported by the digital tools. In an FM organisation, where for example a BIM-based CAFM system has been introduced, a person with BIM skills should be employed. Alternatively, an external BIM consultant can be involved. If for instance the CAFM system is intended to support activities related to apartment moves, the employees who are responsible for the apartment moves should be trained in using the CAFM system.
In general, when introducing new technology, significant resources often have to be invested in establishing the basic data and in upgrading and training employees in the technology being introduced.

What the future holds

In the future digital technologies will undoubtedly have a great influence on the Real Estate and Facilities Management areas. Especially data collecting and data analysing technologies (see Figure 4) will be used and can potentially create value in the future. Many data collecting technologies are already in use in our buildings and cities, but data is not always collected and utilised. Several data analysing technologies are being developed, often with advanced algorithms that can handle and analyse large quantities of diverse data (often called Big Data). New technological solutions are continually being introduced; and some of them may become disruptive. Technologies that could become disruptive are GIS-based, BIM-like solutions that could change the way we use e.g. CAD and BIM today. No matter where the development leads us, new digital solutions can only create value, if we handle the implementation process in a structured way.

LAU MELCHIORSEN has more than 25 years' experience in the real estate industry, both in Denmark and internationally, through his work with properties in Eastern Europe and the Baltic countries. For the past 10 years, he has worked with companies and advised them in connection with optimisation of their properties and portfolios, domicile searches and locations, as well as international portfolio management and negotiations.

Location requirements and portfolio management in a digital age

To cut a long story short

Digitization changes portfolio management in several crucial ways:

The core business changes the business model and becomes digital. It appears more drastic for some than others, but almost all companies are affected by digitisation in their core business, which also changes what it means to have the right buildings in the right places.

Data and digital tools allow conscious strategic management of property portfolios, much in the same way as all other business areas. Therefore, the Executive Board expects property portfolio managers to have control over what the individual properties supply to the company in terms of both costs and the organisation's overall performance.

In the public sector, municipalities and regions have grown larger and developed professional FM organizations that have a general overview of the municipality or the region's needs.

On the investor side we see new, large players who would like to make buildings available to both public and private users; pension companies investing in property, the entrance of foreign investors, and the traditional real estate investors are consolidating and developing.

Property users have had many opportunities to find the 'business model' that suits them best. Both ownership and tenancy involve operational responsibility: decisions about what should be outsourced and what retained, and the nature of strategic cooperation with suppliers, tenants and landlords. This means that the benefit of having a professional, strategic approach to location requirements and portfolio management has grown.

Today, many companies retain a location for reasons such as maintaining a tradition or fear of selling at a loss, regardless of whether the property is no longer fit for purpose due to location or layout and thus does not support the company's performance. Therefore, it is crucial that the building portfolio be assessed holistically to include both costs and its ability to support the organization's productivity. Such an overview can only be created with both profound knowledge of the company's critical success factors and which solutions and alternatives the market can provide.

Localization

Historically, the location of companies was closely related to access to the basic elements required for production. In very early industrialization, companies were located close to either raw materials or their suppliers, but to keep pace with development, a number of companies in the local community were founded on the basis of a good idea. These companies were often established by a young inventor, who started in a workshop and gradually expanded the company.

As the need for labour in rural areas decreased, people moved to where the jobs were, which were generally where the factories sprung up, hence many cities have developed in step with local businesses. In Danish terms, Billund would not have been the same without Lego nor Sønderborg without Danfoss.

Traditionally, FM has focused on operating and maintaining existing capacity in optimal and efficient ways. The premise on which properties were run was never challenged, nor was whether existing levels remained the optimal solution in relation to current needs ever questioned.

As FM organizational competencies have often been governed by operations and maintenance, they tend to be focused on craft or engineering backgrounds. In step with the increasing focus on canteen and reception services, service personnel have also been employed, yet many places still lack financial or strategic understanding and insight into the business. Therefore, FM often finds it difficult to challenge organizational strategy and hence focuses solely on savings and increased efficiency.

However, technological and digital advances have meant that business development places far greater demands on the company's adaptability. Most of the most valuable companies in the world today were unheard of a generation ago. The average life expectancy of a business has become shorter – in turn, companies create much greater value in their short life span.

When building corporate domains and industrial buildings 100 years ago, it was commonplace to make the company name part of the building and the names can still be seen on buildings worthy of conservation. However, today company names are inscribed with signs that can be changed overnight, if employees and customers should wake up to a new merger or a move to a new setting that better supports the success of the business.

Therefore, it has become more important than ever for companies to continually adjust the property portfolio so that it supports, for example, recruitment and retention of key employees, productivity, innovation and collaboration.

Data and digitization

Property management requires access to relevant data across the organization.

HR should, for example, have an overview of both current and future staff needs, not just in terms of numbers, but also in relation to factors such as demographic patterns for future recruitment of the right skills. Finance / FM should have an overview of the overall economy and the total commitment regarding individual lease contracts. IT should have a strategy for future needs, and sales and marketing should have a strategy for individual markets and locations.

All of these elements should be linked to an understanding of how employees in the future should cooperate and work in the future workplace. (It will be FM's major challenge to integrate all these considerations into a comprehensive strategy, including a dynamic portfolio and location strategy.)

This will usually be an ongoing process and change over time, as it would be an incalculable economic and organizational task to replace all locations at once. There are often longer contractual terms of sale or sales costs with regard to property, as well as significant moving and furnishing costs.

FM is defined to cover 'people', 'places' and 'processes'. This tripartition can be the overall starting point for the data a FM manager should create in collaboration with functions such as HR, IT, and Finance, remembering that having a strategy for where you want to go is not enough. You also need to know where you are at the moment, otherwise you do not know whether the goals of the future lie 'to the north or to the south'.

	Current situation	Future needs
People (Employees)	Current employees Current competencies Where do the employees live?	Do we need more or less? Do we need other skills? Where do we find future employees and where are they prepared to work?
Processes	How do the core business processes look today and how are they supported by building facilities and services (FM)? What does proximity to customers, suppliers, co-operative partners, etc. mean?	Where are the core business processes going? How can we support future work processes? How will proximity to stakeholders and business networks change in the future?
Places (buildings and facilities)	Area Cost / square metre Cost / employee Costs in relation to competitors Condition Indoor climate Interior design / space management Which workflows are supported? (Individual / teams / cross-organizational)	Future area needs Future interior needs Future quality level (in relation to competitors) Future location needs

Data should be compared and reviewed in relation to markets and existing locations, taking into account the duration of leases, the investment framework, etc.

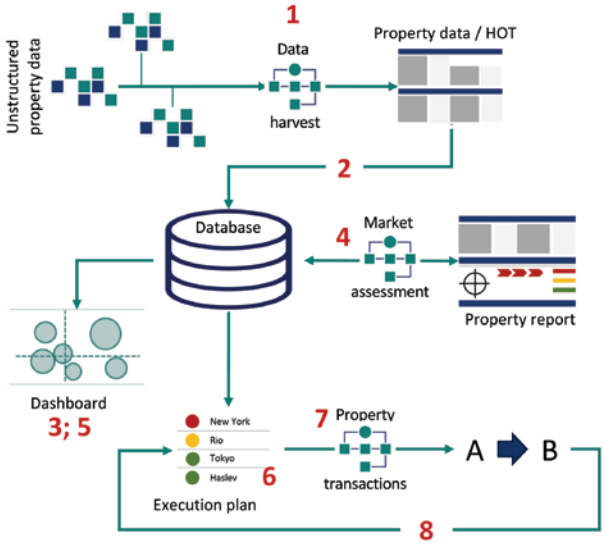
Conversely, the challenge is to focus on key figures in relation to the overall management. In some contexts, for example, knowing the costs of maintenance, energy consumption, canteen operation, etc., whereas these data can be disturbing in relation to the overview of rental costs and maturities.

Portfolio Management

As mentioned above, data is crucial to effective management of a property portfolio. Much of the data can be collected from the organization, while some often requires input from external professionals.

Data on the number of employees, turnover, and expectations for growth and organization should come from the local organization – possibly coordinated with the overall development and strategy. Conversely, data on an existing property or lease should be collected directly from the original documents using professionals, as data quality is often poor if reported by the local organization. These professionals will also be able to compare the lease agreement with market data and standards to provide a professional assessment of the property or lease, which is a key factor in assessing whether there is optimization potential.

Delivering portfolio transparency – process overview



1. Property data is collected using a data harvest sheet and sent to CRE.
2. Data is entered into the database
3. Upon completed collection ...
   - Data vetting
   - Establish baseline
   - Check compliance with policies and benchmarks
4. Market test all properties using JLL network. Property data is enriched with market feedback.
5. Segment portfolio (timing, size)
6. Develop execution plan
7. Execute transactions using the JLL network
8. Optimized properties circle back into database and execution pipeline

Based on the collected data, an overview of the portfolio should be created to show current key figures such as annual costs per employee and area per workplace. This would make it possible to assess whether the facilities support the company's strategy and core processes and, moreover, the opportunity to subsequently assess what is needed for buildings and facilities to meet future needs.

Owning and renting

In the 'old days', companies constructed buildings at their own cost, and thus they were part of the production apparatus to be maintained, expanded, and renewed in accordance with the company's needs.

This is still the case for companies with a large industrial production. It also makes good sense in cases where the property's primary function is to keep the production equipment dry and warm, since the production facility is the largest investment and expensive to re-purchase and / or move.

Conversely, companies with primarily light production processes or few offices tend to switch to renting. This also often applies to warehousing, distribution and logistics facilities as these are gradually standardized and can be quickly adapted to the procedures of other companies.

Previously, companies were required to calculate rent and lease obligations as part of the annual financial accounts but this was not included in the balance sheet. With the new IFRS 16 accounting rule, total lease obligations must be included in the balance sheet, which is why renting in itself does not improve the company's key figures.

In connection with owning properties, it is also important that the property's value is known, and there is a significant difference here between whether the property is still to be used by the company for a defined purpose, or if the company is in the process of finding new premises. Properties can function well, and hold value for the current owner, if they promote the overall productivity and efficiency of the business. This includes the question of whether the buildings support the strategic changes that all businesses undergo, albeit some faster than others.

If a building is to be assessed in relation to its value in the market, then it is important to have a realistic assessment of what changes, modernizations and renovations a new user would most likely require. Renovating is relatively costly compared to the cost of building new structures, which reduces the value of buildings that require major renovations or modernizations. On the other hand, it is extremely important that the properties have the right location, which again tends to raise the prices of existing properties.

Localization options

Many decisions on whether to remain in current premises or moving to new ones are historically based on coincidences and assumptions, without these being justified by facts or assessed in the context of relevant alternatives. Requirements for quality, size, and location should to a far greater extent be based on knowledge and data created in cooperation between HR and IT, and honouring the future wishes regarding 'People, Processes, and Places' rather than conjecture and emotions.

The optimal decision should be based on clear and transparent criteria and assessed on the basis of various alternative scenarios.

This still means that the criteria and their priorities should be a management decision, justified by an assessment of the current and future needs of the company. Moreover, the criteria and priorities should reflect the overall business strategy of the company, which requires an understanding of the various needs of customers and employees, in particular, and the influence of the surrounding environment.

As companies grow, there is an increased need to manage more locations nationally as well as internationally. These locations may be established with a view to various functions. Many companies today have centralized warehousing and distribution centres, sales offices, and research and development centres, data centres, etc.

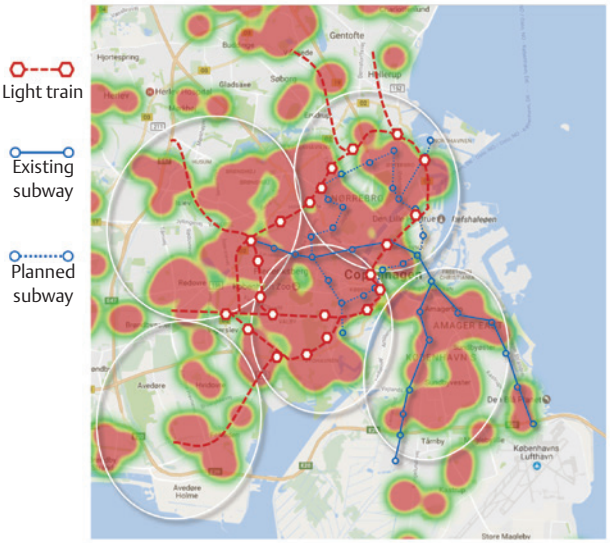
In the 'new economy', employees are the key resource, and a company's ability to retain and attract the right employees in the future will be crucial to its development.

Often, localization decisions are made based on the management's subjective preferences, so companies should pay close attention to the choice of location with regard to both being able to maintain existing employees and, to an even greater extent, being able to attract employees in the future.

A built-in resistance can often be experienced by existing employees, since in case of relocation there will always be someone who is put in a worse position than before. In addition, in most people there is an inherent scepticism towards change, due to the uncertainty of what is to come.

Traditionally, the starting point is usually based on the current employees and their distance to work, occasionally favouring the management, but other criteria such as proximity to customers, suppliers, partners and possibly educational institutions should also be weighted appropriately.

Digitization means that many companies have changed their business model to have online contact primarily with customers in the future. This applies, for example, to insurance companies that no longer place themselves in close proximity to customers, but to a much greater extent, place themselves where they believe they can attract the right employees.



Example of maps of existing employees and expectations onto future employees in relation to public transport.

The competition for new employees generally, means that factors such as have to be taken even further into account when recruiting new employees.

Therefore, it is also important to consider whether the organization is large enough to actually have its own office, or if it's preferable to rent existing office environments or office hotels.

In a market without a full overview of the future, it can be a great advantage to rent into an environment with shared service and flexible leases.

Criteria and weighting

It is of prime importance is to define the objective with regard to domicile considerations; separating the imperative criteria ('must have') from the important considerations ('nice to have'), a combination of which can be critical in an evaluation process.

The crucial issue is whether to ignore opportunities that do not meet the criteria or include and weight them in relation to others. The

requirement for a location near the airport for a city the size of Copenhagen, for example, can be achieved given that most of the city will be within reasonable reach but it is clear that Ørestad is closer to the airport than Lyngby.

Equally, the company could require employees to travel on business and desire proximity to the airport, also for the sake of international visitors. However, if the company is domiciled in North Zealand, proximity to the airport may well be at the expense of many employees' daily transport time.

Group	Weight	Criterion	Weight	Example	
Geography	25%	Amenities and surrounding area / "city life"	11,1%	25%	15,0%
		Employee commute	11,1%		15,0%
		Access to future employees	11,1%		20,0%
		Motorway access	11,1%		0,0%
		Proximity to airport	11,1%		10,0%
		Parking in the vicinity	11,1%		5,0%
		Proximity to partners and clients	11,1%		10,0%
		Proximity to education institutions	11,1%		0,0%
		Close to metro / s-strain / train stations	11,1%		25,0%
			100,0%		100,0%
Building and Leasehold	25%	External areas	9,1%	30%	5,0%
		Flexibility and scalability of leasehold areas	9,1%		15,0%
		Floor plan, space compliance, functionality	9,1%		20,0%
		Arrival	9,1%		5,0%
		Quality, image & identity	9,1%		10,0%
		Parking	9,1%		10,0%
		Bicycle parkering & changin rooms	9,1%		5,0%
		Other companies in the neighbourhood / on site	9,1%		0,0%
		Canteen	9,1%		10,0%
		Share meeting facilites	9,1%		5,0%
		Reception	9,1%		15,0%

Process

The purpose of a structured process is to ensure an implementation that is both transparent and logical in order to make the best choice. Conversely, it must also be ensured that the choice of domicile and interior design are a management decision, in which case some choices are made during the process.

Regardless of whether the priority and the choices are a democratic process or purely a management decision, the reasons should always be clearly defined so that the choices are transparent.

Even if all current employees live close to the existing domicile, for instance, this should not determine a company move. In this case, it could be that the weightings of visibility, proximity to customers, research or education by far exceed the consideration of the current employees.

Alt 3: Nielsensgade 3 - 1561 Copenhagen V						
DKK	Amount	Area		**2018**	**2019**	**2020**
Nielsensgade 3, Office		300		**390.000**	395.850	401.788
		0				
		0				
		0				
Nielsensgade 3, Basement		800		**520.000**	527.800	535.717
Nielsensgade 3, Car parking		113		**1.898.400**	1.926.876	1.955.779
TOTAL RENT			**33.316.786**	**2.808.400**	**2.850.526**	**2.893.284**
Service charges incl. heating				**210.000**	213.150	216.347
TOTAL ANNUAL COSTS				**3.018.400**	**3.063.676**	**3.109.631**
Rental discount	-702.100	3 months rent		**-702.100**		
Other discounts	0			**0**		
Relocation costs	4.581.500			**4.581.500**		
Tenant deliveries	0			**0**		
Re-instatement costs	1.000.000			**1.000.000**		
TOTAL COSTS			**40.687.472**	**7.897.800**	**3.063.676**	**3.109.631**
10-year Net present value			**31.288.947**	**7.897.800**	**2.876.691**	**2.741.635**
Savings compared to current lease, nominal			-1.971.212			
Savings compared to current lease, %			-6,7%			

Economy

Economic concerns regarding a new domicile cannot be disregarded so it is important to make the financial considerations clear throughout the process.

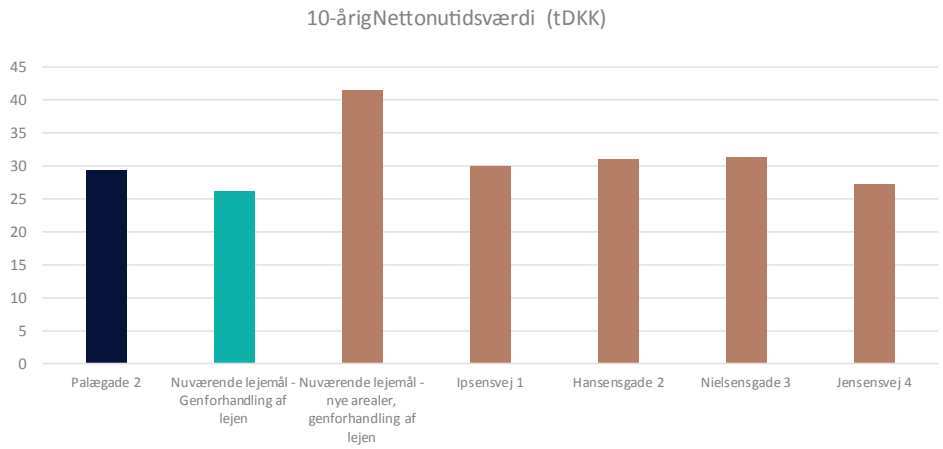
It is also important to relate the costs for construction, operation, and maintenance to the company's total costs.

Therefore, the business case implemented should compare the total economy of the various alternatives over the same time span to include all comparable operating costs and the necessary investments.

2021	2022	2023	2024	2025	2026	2027	2028	Nominal total
407.815	413.932	420.141	426.443	432.840	439.332	445.922	452.611	**4.626.672**
								0
								0
								0
543.753	551.909	560.188	568.590	577.119	585.776	594.563	603.481	**6.168.896**
1.985.116	2.014.893	2.045.116	2.075.793	2.106.930	2.138.534	2.170.612	2.203.171	**22.521.218**
2.936.683	**2.980.733**	**3.025.444**	**3.070.826**	**3.116.888**	**3.163.642**	**3.211.096**	**3.259.263**	**33.316.786**
219.592	222.886	226.230	229.623	233.067	236.563	240.112	243.714	**2.491.285**
3.156.276	**3.203.620**	**3.251.674**	**3.300.449**	**3.349.956**	**3.400.205**	**3.451.208**	**3.502.976**	**35.808.072**
								-702.100
								0
								4.581.500
								0
								1.000.000
3.156.276	**3.203.620**	**3.251.674**	**3.300.449**	**3.349.956**	**3.400.205**	**3.451.208**	**3.502.976**	**40.687.472**
2.612.920	**2.490.248**	**2.373.335**	**2.261.910**	**2.155.717**	**2.054.510**	**1.958.054**	**1.866.127**	**31.288.947**

If there are proprietary investments in buildings, the disposal value of the property at the end of the time span should also be taken into account.

The total cost for each alternative can then be compared and together with the quality assessment (scorecard) form an objective basis for the overall assessment and decisions.



Conclusion

An active management of the portfolio at the property or tenancy level requires that the property function be given new competencies and more responsibility in relation to the business. The existing competencies are often focused on building maintenance, operation, and service, but may be lacking in relation to finance, financing and business models.

The person in charge of portfolio management must be able to react proactively to the business strategy changes decided by the Executive Board. This means that each time the Executive Board agrees on a major or minor change in strategy – or has made plans for implementing the overall strategies – the portfolio manager must be able to inform them of how this affects the company's building portfolio and location. In other words, when the board of directors wants to take the company a certain direction, they'll know the consequences with regard to whether the right buildings are in the right places in the future, or not.

There are a number of products on the market designed for companies to support centralized management of the property portfolio, such as Planon and SAP. For many companies, however, it will be to shoot over the target, and much can be controlled with a spreadsheet, if one focuses on the key figures.

Sometimes, it is more important to get started and learn from the process than to try to devise the perfect solution, which can take a long time to build and implement.

GITTE ANDERSEN, SIGNAL powered by ISS. As the founder of SIGNAL Gitte has established SIGNAL's philosophy concerning the ways in which the physical framework can promote the way people collaborate, communicate and innovate – and use space as a tool for better performance and increased outcome! To create coherence between workplace design and service experience. Gitte Andersen has authored several books on the connection between space and performance (Space at Work, published by Akademisk Forlag, and Smart Square Meters, published by Praxis).

Buildings of the future

Scenography for experiences between people!

It sounds like the title of a B-movie when trend researchers talk about "The war of talent" being upon us but this is far from the case. It is just one of the many management terms used to articulate the Quintessential workplace reality of the contemporary workplace. Young employees entering the job market today have different expectations and requirements from those I had when I searched for my first job and asked for pay and job content. Today, the physical framework and the right working environment in themselves can be the reasons for choosing a workplace, as well as how the agile work is supported or if there is freedom to choose from diverse facilities. Perhaps most importantly: What are the experiences offered and serviced? Is there a strong culture, and are ethics and values on the agenda?

Whether health and work-life balance are among the company's concerns, or the ability to design work life around personal needs at a particular moment in life, companies are struggling to be specific on all parameters. Common to those who are at the forefront, however, is a new focus on the experiences that the workplace offers, and how they are curated or serviced in daily life. Only when this strategy is in place, comes

the talk about workplace design and how it, in terms of for instance technology, must support the overall experience strategy.

Digitization allows FM to play a central role in this changed focus, both in the preliminary collection of behavioural data about future employees and their needs, as well as data on measuring success. This is because along with this changed focus, there's an increasing need to document what was desired: success in increasing productivity, attracting and retaining employees and creating a healthier working life in balance. This requires data – pre and post measurements. In other words success is something that can be documented in the context of the management's overall strategies.

This will give FM the opportunity to withdraw from the one-sided cost focus and instead connect management strategies and values with people and experiences using on-time data on where the value is created.

To start with some data that might explain why a change of FM's focus is undergoing rapid change right now:

Data on employee focus:

- For 70% of young millennials, workplace is more important than pay (Accenture, 2016)!
- Millennials form the generation of 'gig' workers and will probably have 18-20 jobs throughout their working life. Their success criterion is not to be linked to a single employer, but focused on the fact that working life becomes a series of 'gigs', where they are as free as a bird to fly around in relation to job content, where they can make a difference and where the work makes sense! Millenniums want to be their own boss – they are freelancers / free agents who work flexibly and on a part-time basis, depending on other interests – and they want to be entrepreneurs.
- By 2020 up to 40% of the US workforce will be freelancers (Intuit, 2010).
- 47% of the workforce said that now is a good time to find a quality job, and more than half (51%) are already looking for new jobs. In the same survey, 53% said that work-life balance is very important in terms of job selection, and the same proportion said that they would change jobs if a new job offered better flexi-time (Gallup, 2017).
- 88% of millennials are looking for jobs that support networks and experiences that engage them (Landrum, 2018).
- Sickness absence due to stress is still a trend that is rising and costing society billions!

Data on the use of space and square meters:

- 10-20% of office space in larger cities is empty (Lokalebasen, 2018)
- Workstations at the individual offices are typically empty approx. 60% of the time (SIGNAL BENCHMARK, 2000-2018[1])
- SIGNAL Benchmark show that the more an organization collaborates, the less space it uses and the more work areas are shared, the less office space needed – more for less!
- Other data also shows that employees are more efficient, more innovative and more satisfied with their work when they collaborate (Deloitte, 2013).

Data on the top management's focus

- SIGNAL BENCHMARK shows that C-levels are preoccupied with pressure on costs along with employee attraction and retention, which often expresses itself in the following focus:
- Requirements for optimization of square metres and better use of the physical framework.
- Requirements for increased productivity, efficiency and performance but with an increased focus on outcome rather than output (75% of top management says there is a need to simplify work processes, that globalization and digitization have created overwhelmed employees, and new focus is needed on the core task).
- 50% percent of top management say the biggest challenge right now in relation to employees is to create meaningful work and to ensure the right job fit in order to ensure a longer retention in the job.
- New focus on innovation – 94% of top management says it is essential to develop and create the future organization (Deloitte, 2017), but only 56% say they have a plan for it (Deloitte, 2016).

The scene is set for a paradigm shift in FM

The above data paints a picture of an FM transformative process, if the physical framework is to live up to the many demands and wishes of all stakeholders. The days

1 SIGNAL BENCHMARK: Collecting quantitative and qualitative data on the connection between space and behavior from all SIGNAL projects within the private and public sector, throughout 18 years (SIGNAL BENCHMARK 2000-2018)

when a building's primary task was to protect against rain and wind and ensure a good physical indoor climate, so that drafts and bad air were eliminated are gone. Moreover it is taken for granted that workplaces have clean and ergonomically correct installations, which today are considered basic prerequisites. That's not to say that it's 'just' something that is easy to bring about, because it still requires focus and the right skills. However, it is considered by C-level as a prerequisite for 'the new talk' of what buildings are meant to provide!

Focus has moved up the food chain. Large global organizations are struggling to attract the most talented employees, and today buildings are seen as a tool to ensure better performance. Investments are made in buildings and workplace design to ensure that employees can deliver on productivity and efficiency. Retaining employees has become a strategic outcome that equals reducing operating costs, carbon footprint, increased productivity, and not least – as a new boost – to develop innovative practices to ensure the company's continued existence!

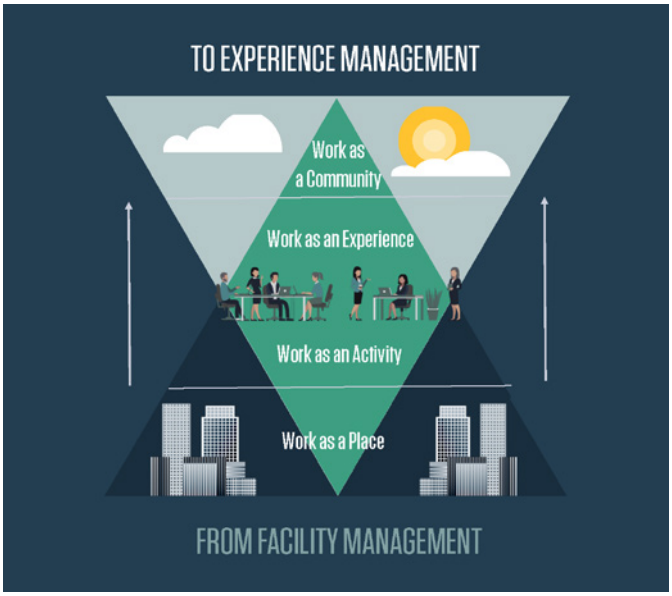
The buildings and workspaces that up until now have been offered to these employees have competed for everything from delicious design and furnishings, diet and health and relief in terms of daily tasks (dry cleaning, shopping, catering, etc.). Here, all the major organizations are world champions, and virtually the same is offered on the shelves everywhere.

Where today's buildings and workspaces make a crucial difference are as scenography and frameworks for experiences; not as a huge amusement park but with experiences that form the framework for building authentic communities with a focus on openness and closeness. They give a sense of belonging to where ordinary everyday life is celebrated, yet seasoned with experiences that go beyond the individual workplace and the tasks that take place there. The new communities are network communities that extend beyond the individual organization to the local community and to educational institutions and other business organizations in the immediate area. One could say that the buildings of the future must be able to form part of an ecosystem of networks and related experiences, where the individual building must be able to host and curate a wide range of experiences around the clock. Therefore, its availability should not be limited to regular 'office hours', whatever they might be in the future. There are global

organizations where office work is already set on three-shift changes that are typically trading and interacting in global markets with large time differences.

If buildings and their surroundings are to be included as a resource that the local community can also draw upon, then it is here that interaction with the local community takes place in connection with a wide range of activities: music events, food markets with local products and recipes, morning yoga, running clubs, common eating, lectures, etc. Reaching out to the local community and taking part in their experiences, also allows them to participate in some of the organization's events and venues.

In other words, the focus has been moved from Facility Management to Experience Management – or rather – to People Management.



From this it can be seen that the dialogue with C-level in the largest organizations has progressed from a talk about output to outcome. In other words, it is important that all the measures taken in the context of workplace design, facility service, experience service and everything that is offered to employees in the workplace now promote the organisation's overall outcome. As referred to earlier, these outcomes often manifest as very large agendas, such as increased retention of employees and reduction of costs

and carbon footprint, so it will also be equally important to be able to document that the measures that are offered also influence the big agendas.

This requires a range of new, important data documentation in which FM must begin to take a serious interest.

The difference between leading & lagging data!

Aside from the fact that data is the source of being able to document the value created, it also constitutes a shift from collecting lagging data to leading data.

Much FM data has historically been in the format of lagging data; not only on gross area and square metre occupation, but also in relation to existing buildings, which means that too much space may be poorly utilized already. This entails gleaning data on operating costs in buildings on which there is already a long lease contract so that optimization potential is limited.

When referring to leading data, it is on-time data that provides up-front knowledge about the connection between space and performance, an example of which could be:

To be able to measure and document that outcome is changed using pre- and post-measurements, so that data and evidence on the value creation generated with customers can start to be collected. This requires distinct measurement and data collection from the very traditional, quantitative data, such as gross areas, the number of employees, the number of employees eating in the canteen, footfall through the building entrance control, maintenance costs, etc.

Following on from this, employee satisfaction must be measured, not only for the benefit of employee retention because usually once an employee has decided to resign, the decision is irreversible, and then it is too late to change their mind. Therefore, it is important to spot signs of either satisfaction or dissatisfaction at an early stage to be able to respond quickly, possibly by adapting experiences and service offerings for the better.

It is often a large number of relationship-based measurements, or soft data, that cumulatively give a picture of employee satisfaction, for example. Similarly for outcomes such as increased productivity and efficiency, which can be measured using metrics such as reaction times in the organization, the extent of internal meetings and the time spent on them, the number of internal mails read each day, skype calls in lieu of travelling to meetings, and not least being able to benchmark these data with other organizations.

In other words, the individual FM departments are required to prepare a new practice for data documentation and evidence on outcome-based success criteria.

New skills around the table to deliver on strategic FM experience management

Matching customer requirements for future outcome and experience services with the workplace design that will achieve them requires a new focus: an interdisciplinary FM organization that creates coherence throughout the experience food chain.

Given that employees and experiences in the workplace have become the key to corporate success, increased collaboration between HR and FM / CRE functions is required to fully understand the needs of employees. However, these departments often operate independently yet make decisions that affect each other. For example, IT may have invested in expensive hardware for the workplace whilst HR simultaneously implements mobile work policies that limit the impact of this new equipment. Similarly, CRE / FM functions can extend the lease on the building, even if a move into new premises is planned.

This suggests the need for a Chief of Work Officer, who can help eliminate existing boundaries between departments and increase lateral transparency. Companies such as Airbnb, Ericsson and Decker Brands have created such roles and positions in the workplace as Chief Employee Experience Officer.

Therefore, Facility Managers who strive for and want to understand their new role in the future FM organization should focus on:

- An understanding of FM's changed mandate, mission and role.
- A rethinking of the FM structure and ensuring that there are enough specialists in the FM team.
- An upgrade that includes data-based technologies that enable a better understanding of employee and workplace experiences – focusing on data!
- A rethink of FM's capacity development.

The workplace is no longer seen as the epicentre of an organization but remains essential to create and support the culture that will deliver the overall strategy and improve performance.

To make it effective, the physical framework – combined with person-centred and curated service – must provide a holistic experience in the workplace, where end-users can be both productive and thriving. To succeed, organizations will need a more dedicated resource to orchestrate these value-creating activities to a greater extent, realized through creating new roles in the FM organization.

In collaboration with IT, CRE and HR, Facility Managers are in the unique position that they can function as facilitators; creating marginal increases in performance for each employee by creating an environment that allows people, the workplace and processes to converge and march hand in hand. This provides better business outcomes and ensures a strong competitive advantage.

The Facility Managers, who in a joint effort with HR, IT and CRE functions can balance as well as deliver on these requirements, will be the key to creating innovative and highly performing organizations with excellent employee and customer experiences!

It is important that FM is capable of offering advice that matches the strategic dialogue at C-level, not only within the operations department. This also requires that FM providers have competencies that can deliver on the establishment of experience strategies, not least on how these should be curated. These are competencies that go far beyond the fact that the building is clean, food quality is good and that the

temperature is constant. Rather it requires new positions such as Strategic Experience Designer or Event Manager, who are able to create networks and reach out to the local community and other local stakeholders.

However, it is not only in the strategic FM organization where new titles are required but also for the employees on a daily basis, who must deliver the new curated services and look different:

- Out with service uniforms and white coats and in with a cool and trendy dress code.
- Out with traditional receptionists and in with Hello Hosts, who provide service with a large YES in the forehead and proactively seek out the employee at eye level!
- Out with access cards to the fitness centre and in with Personal Fitness Coaches.
- Out with the invisible meeting room service worker and in with Meeting Hosts, who, in addition to being able to prepare for a meeting (room fit for purpose, tools fit for purpose, technology fit for purpose) can also facilitate a meeting, a brainstorm or a hackathon process.
- Out with long queues in the canteen and in with a number of food stands, where food is cooked to order, and paid for via mobile in order not to have to queue again at the till.

This probably requires multi-skilled people who deliver on many different experiences throughout the day, such as a DJ dance, a yoga workshop, a bike training, barista in the coffee shop, a tech nerd in the Tech Bar, etc.

Furthermore, to meet the challenge of furthering the organisation's strategic outcomes, FM must work much more across the disciplines than before. If experience service is to reflect the workplace / campus, then workplace design needs to be integrated into the overall ecosystem to span the value chain from strategic outcomes to solutions. For this to happen, the future FM organization must reflect the format of 'strategic advisory excellence centres', which embrace data and benchmarking, and connect C-level requirements with all FM strategic outcomes initiatives: from experience to service, from design to operation and maintenance, whilst simultaneously co-ordinating with HR, Communication and Technology. Moreover, this excellence centre must be able to document to management that it generates value.

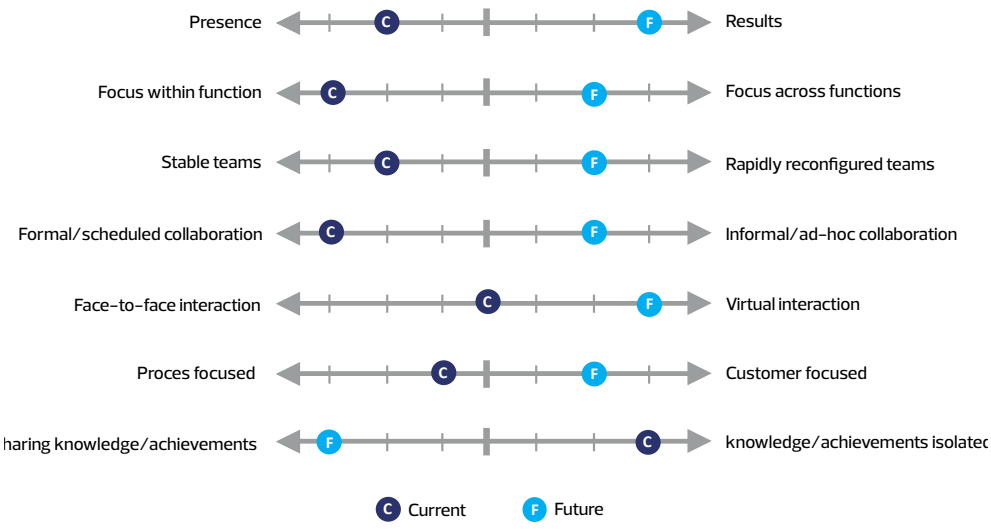
Therefore, the future of FM is about understanding the customer in new ways:

- The kind of employee / customer experience to promote.
- The strategic outcomes that customers focus on.
- The kind of journey the customer has in relation to change management, and in terms of the way they want to challenge employees to work in new ways.
- How data and technology can play an active role as a prerequisite for getting the room as 'enabler' to promote performance.

These questions should be answered in terms of data on behaviour and performance, knowledge about the use of buildings, as well as the building's role as an active 'enabler' to drive the many experiences during the day with individual opt-ins and deselections (development of campus apps, campus social media, etc.).

All this is something the big global organizations already expect a precocious FM provider to deliver on!

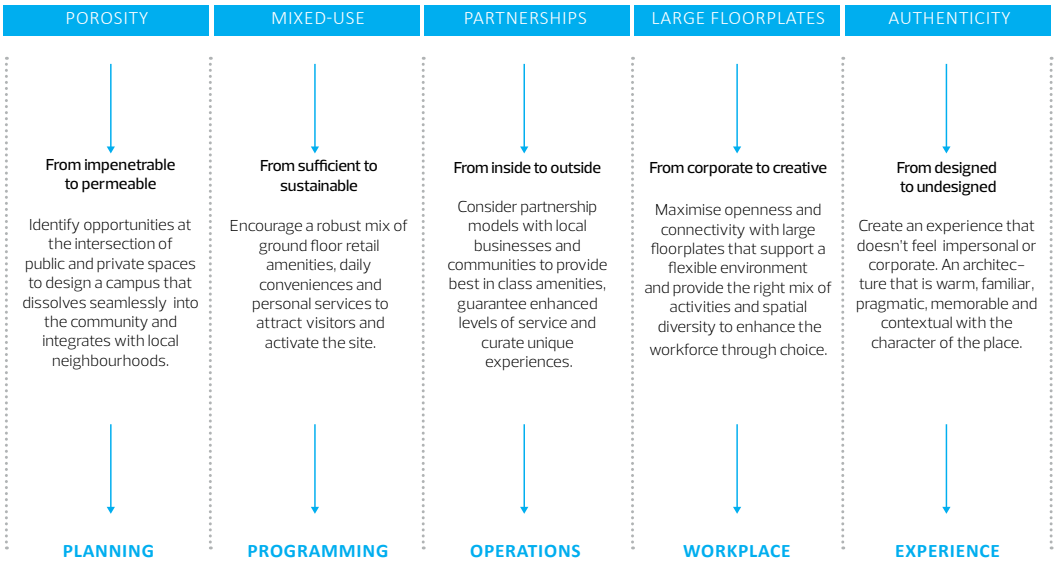
Visions for Future Workstyles



An example of the transformative journey a large global organization from the banking sector has embraced, taking a new focus on experience, service and workplace design.

Masterplan for General Experience Guidelines

The masterplan aims to create a set of experiences and choices that consistently provides inspiration, surprise and delight. The guiding principles below should constantly by referenced as they influence all aspects of the project.



An example of the focus that a large global organization from the banking sector has on its new campus (note that experience has its very own focus area). We are already in the process of experience management!

The ability to gaze into the crystal ball will be an important competence

Existing and important focal points of global organizations fighting for the same skilled employees are:

- Knowledge of users and future megatrends.
- The ability to spot trends and tendencies before anyone else in the market.
- Spending time and resources on gathering knowledge about what characterizes a 'great place to work' among the demographic making up the labour market today, as well future workers.

Leading data has already been discussed in this chapter but in order to generate it, requires competences beyond the traditional FM profile. These rely more on cultural-so-

ciological and anthropological traits that can uncover behavioural trends in different cultures, industries, and generations. Equally, it requires the analytical and technological expertise to develop new survey designs that uncover this data; not least derive megatrends from these data and where data documents the real value creation that is delivered to the customer. Furthermore, the architectural and design advice needs to ensure that the programming of space as well as its design interact with the other segments of the value chain, from strategic outcomes to solutions.

Trends & Tendencies for Future Work

Over the past 18 years, SIGNAL has conducted many user surveys, allowing insight into the trends and tendencies in the current labour market, both among those who are in the labour market now, as well as those who will enter the labour market in the near future. Currently, we can see the following trends:

- The search for meaning, from task to mission: How do I contribute to society, make a difference, create value? The focus has shifted away from being exclusively on job titles, wages and benefits.
- Cultural significance: employees look for organizations with strong cultural communities they can identify with and workplaces that offer a sense of belonging.
- Employees expect flexibility on their own terms, which can also change depending on their stage of life; taking a sabbatical, starting a family and hence desiring a part-time job, cultivating interests, or competing in sport at elite level.
- Employees are looking for organizations that promote and support creativity and innovation. In order to move away from employee control to facilitating innovation and outlandish creative ideas, the workplace must be able to support individual needs and satisfy personal preferences throughout the day.

Leading from this, we can also see that there are four major megatrends:

The ageless workplace

An 'ageless' working environment enables people to work as long as they want and are able to, which renders age irrelevant as a factor in an employee's ability to work in the sixty-plus age group. Research has shown that the over fifty's are generally better entrepreneurs: 70% of start-ups last for five years, while the figure is only 28% for the younger self-employed (Bridge, 2015). This leads to a new focus on:

- Ageless canteens as places of nutrition with a focus on foods rich in vitamins and minerals.
- Mental Training provided by employers to help older workers stave off dementia through regular activities that train the brain and keep them sharp.
- Wise networks to allows employers to utilize the long-term experience and knowledge of older employees by using them as part-time consultants who can impart knowledge and experience to the entire workforce.
- Wellness courses and programs to allow all ages to manage the challenges and stress of a busy work life.

The Mindful Workplace

A mindful, calm and attentive workplace that nurtures health and mind performance should make digital overload a thing of the past, so that employees no longer feel increasingly overwhelmed by the constant need to be online and accessible. This focuses on mental as well as physical health, allowing the mindful employee the flexibility to strike a balance between work and leisure and signifies:

- Disconnect: mindful employees are beginning to turn away from the busy, always-online, digital lifestyle.
- Regular breaks, which are important when finding new ways to increase productivity and involves new spaces and frames that bring nature into the workplace.
- Daydreaming to encourage employees to take breaks in order to promote problem solving and productivity, which involves a creative thought process over extended periods to find the right ideas.

The intuitive workplace

A workplace that keeps track of employees' working environment, mood, desires and needs to create an all-encompassing, intelligent and intuitive work environment. As data collection intensifies due to an increase in personal technology, this generates more information on how we work. Multi-channel marketing or data-driven, tailor-made solutions that give the individual employee a personal experience customised to their specific needs will emerge. Close-proximity services where habits can be tracked and measured, and location-based technology that bridges digital and physical interactions.

- Productive behavioural patterns gleaned from how employees use mobile devices and habits allow employers to deliver on the needs of each employee.
- Orchestrated work environment to analyse employee interaction information in the workplace facilitates the creation of new 'collision' points to promote new ideas, innovation and creativity.
- Big data offices allow organizations to develop big data plans using analytics and computers to identify hidden patterns that improve connectivity between space and behaviour to connect people with space and technology.
- Cognitive buildings means the properties will be 'smart' in the sense of being intelligent, using data provided through the fast-paced 'Internet of Things' solutions to give real-time, customised information on a range of services in the workplace. This could be to inform the employee about where there are activities relevant to them or exciting to participate in. Equally, to alert which spaces are occupied by colleagues, but ultimately it will allow for a better square metre utilization as it also gives visibility on which areas are NOT used during the course of the day.

  These varied new technologies are already changing the way we work so that more work can be performed virtually, which give greater mobility and freedom throughout a longer period during the day than the traditional nine-to-five. Between 2012 and 2016, the proportion of people working 'remotely' increased from 39 to 43% (Gallup, 2016) and the employees who do this also spend more time on it than before – which requires an increased focus on the agile workplace.

The collaborative workplace

We see a new focus on establishing a workplace that is cooperative, sociable and united in the way it performs. Increased access means that the modern employees will actively participate in at least five different ad hoc teams simultaneously; "The woman's time" one could call it. In an increasingly social, transparent and interdependent world, the traits traditionally considered to be masculine are no longer effective – we will see a new focus on:

- Employees who want a collaborative work environment that boasts creativity. They prefer hot-desking rather than the traditional, fixed structures.
- Employees want an open, transparent environment where they can share information mutually and safely.

- Social Media – Collaborative employees are aware of their online reputation while also being open to using equipment to track work habits to measure their performance.

Data to create coherence between the levels of Corporate, People and Facility Performance

New measurement methods need to be considered how value and success are qualified and documented, to measure the four trends listed earlier in this chapter, for example. Data must be gathered on what the users think about the workplace and service experiences they are offered to determine whether they promote their efficiency and overall satisfaction with the current workplace. Behavioural data becomes the new gold! Therefore, on-data permits immediate action to be taken on the data received, so that successive solutions deliver on C-level requirements for future strategic outcomes to ensure that the company star retains its brightness in the corporate sky.

Technology changes within FM

Technology development, digitization and automation will affect all business areas and the labour market. They allow for new and more effective ways to collaborate, they drive more flexible ways of working, and they contribute to a more efficient way of collecting data and transforming them into pragmatic insights that drive user performance.

Organizations use technology to:

1. Improve organizational structures by:
    a. Improving traditional business models and creating new ones
    b. Improving interoperability between networks
    c. Streamlining the organizational structure and processes

2. Increase the relevance of the product range by:
    a. Increasing the performance of product and service
    b. Enabling complementary products and service systems

3. Drive the end-user experience by:
   a. Creating services that enhance customer value
   b. Improving the satisfaction of end users with relevant and good experiences and touch points
   c. Driving customer engagement and brand value

Due to the cumulative effects of technology development and business operations, the technology will affect the workplace and employees. The next wave of automation will be borne by advances in several technological areas, with artificial intelligence as a common denominator. As artificial intelligence is constantly evolving and becoming more widespread, highly educated knowledge will be automated, and the Facility Manager's tasks will be fundamentally transformed.

It won't be boring! But the FM organizations must make their mark because this is the domain in which the big changes need to take place if they want to keep their seat at the corporate table tomorrow! I promise it will be fun!

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Digitalisation in building operations

Introduction

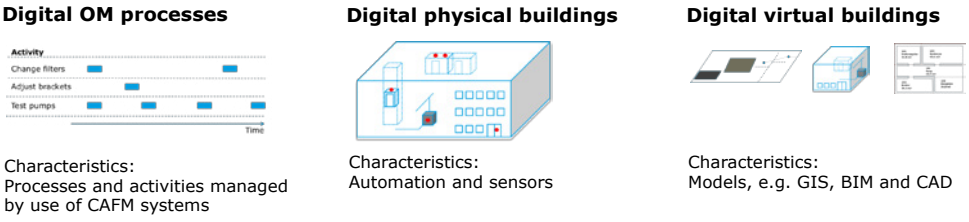
Many areas within building operations are being digitised. This process is changing the way operations are executed, thus a digitalisation process is taking place. The digitalisation process has been around for more than three decades and will probably continue many decades into the future. In this context and in this chapter, the term 'digitisation' covers the digital transformation from the use of analogue tools to use of digital technologies, tools and methods. The term 'digitalisation' covers the change accruing due to digitisation. The term 'digital' is used as an adjective and expresses that something is entirely or partly based on bits and bytes, e.g. a tool or a process.

Digital building operations is not a well-defined concept but can be perceived as consisting of three main parts: digital operations and management processes (digital OM processes), digital physical buildings and digital virtual buildings. This trisection of digital building operations is shown in Figure 1. Note that the three parts are independent, given that one part can exist independently and create value without the two other parts. The value of the latter part, the digital virtual buildings, is, however, somewhat limited if it is not used to support the first part, the digital OM processes.

What characterises digital OM processes is that data and documents with information relevant to the OM processes are stored digitally. Furthermore, management of the OM processes is supported by a digital planning and management system, e.g. a CAFM system.

Digital physical buildings are primarily characterised by digital indoor climate and utilities automation. For example, heating, cooling, ventilation and inflow of light can be controlled automatically. Furthermore, utility consumption can be digitally monitored, including monitoring the consumption of water, district heating, electricity and gas. Something relatively new is that digital physical buildings can also be characterised by digital monitoring and control of people's use of and behaviour in buildings. This monitoring of use and control of behaviour can be based on sensor technology, where sensors are placed in various places in the building and regularly send information about temperature, humidity, CO_2 level, presence of mobile phones, movement and vibrations to a central unit. Based on the gathered data, the use of the building can, for example, be mapped and the users' behaviour can be managed.

Figure 1. The three main parts in digital building operations



The digital virtual building is characterised by being a digital twin or representative of the building's geometry, often as a BIM or CAD model. Terrain and civil works can also be represented in the digital virtual building, often in GIS models. Parameters can be attached to the objects or entities in the models. Data which describe the objects/entities can be attached to these parameters. The digital virtual building is often used in CAFM systems to support specific digital OM processes. For example, CAD floor plans are often used in CAFM systems to support space management and vacating control.

In the following the three parts are presented separately and it is argued that digitalisation should be initiated one operation process at a time and in a prioritised sequence:

- Firstly, the operation process itself should be digitised
- then the physical building should be digitised if it gives value to the operation process
- and finally, it can be considered to support the digitised operation process with digital virtual versions of the building, however only if this gives value to the operation process

At the end of this chapter a suggestion is given as to how the concept, value, can be understood in this context.

Digital operation processes

Essentially, operation of buildings is about planning and managing the operation and maintenance (OM) related work processes and activities (OM processes). In recent years many OM organisations have introduced various IT systems to support their OM processes.

Digitalisation of OM processes is often difficult, may require many resources and can be very time-demanding. This is primarily because digitisation within this field generally requires major changes in the OM organisation itself and in the way in which the OM processes must be executed. Consequently, it is more an organisational challenge than a technical challenge to digitise operation processes.

Despite the major challenges, digitalisation of OM processes will probably continue many years into the future. This is often due to the expectations related to digitalisation; that digitalisation can streamline and standardise OM processes and can improve management information about the OM processes.

Characteristic of digitised OM processes is that the processes are planned and managed by using digital process-management tools (e.g. CAFM systems). For example, activities can be planned, ordered and reported completed in the system. Moreover, an overview in the form of plans and budgets can be established in the system and a

track record of executed activities can be created. Summaries of this information can create the basis for useful management information.

As mentioned above, digitalisation of OM processes does not require that the buildings are digitised with automation and sensors. In the same way, digitalisation of OM processes does not require virtual versions of the buildings in the form of, e.g. CAD or BIM models, or virtual versions of the outdoor terrain areas in the form of GIS maps/models.

It is only when digitisation of an OM process has been implemented and has become routine that it should be considered whether further value can be created by involving the use of the digital physical building (e.g. by gathering data from sensors) or by involving the use of digital virtual models of the building (e.g. by displaying rooms on CAD floor plans or by connecting OM activities to objects in the BIM model).

Digital physical buildings

In most modern buildings, the air-conditioning system, lighting, elevators, adjustment of blinds for inflow of light, access control systems, meeting booking, fire monitoring and much more are monitored and controlled automatically. This automation of buildings is a process that has been going on for many decades. New areas are regularly added to this digitisation process.

Behind every automation there is an OM process. For example, behind the automatic elevator, there is an OM process consisting of the management of a service agreement regarding service and maintenance of the elevator.

Automation does not take over the OM processes but becomes a part of the OM processes. Blinds that are adjusted automatically must still be serviced regularly, have parts replaced and repaired. Some automatic systems can send messages about errors that occur or about problems in the building element and can thus contribute to the OM process becoming more demand-driven rather than being managed at fixed intervals.

In many buildings, the existing automation systems and monitoring of utilities is not utilised optimally. Especially in organisations with many locations and buildings, an overall overview of indoor climate conditions and consumption of utilities is often not created. Therefore, the first sensible step would be to create an overview of which existing automation systems and utilities monitoring systems are installed and are in use in the portfolio of buildings. It is also essential to gather information about how the users of the buildings perceive those areas of the buildings that are controlled by using automation, e.g. how they perceive the climate in a building or inflow of light. Based on this overview, it is possible to assess whether the automation systems function optimally and whether central monitoring of e.g. water consumption or power consumption can be established. Finally, it can be considered whether it would be better to centralise OM of the automation systems and offer this to an external service provider.

Within many OM areas, experiments are being done using sensors and monitoring systems. An example is systems for localising and route planning in buildings.

Digital virtual buildings

Essential to establishing usable digital virtual building models are concepts such as classification, identification and coding. A room in a CAD floor plan can be classified as belonging to the class of passage areas/partition areas and the room can be identified as room number 107 on the first floor in building 14 based on the unique code 107.1.14. Similarly, a building element can be classified as belonging to the class of steel doors and be identified as being steel door number 18 of the type number 3 based on the code steeldoor_03_18.

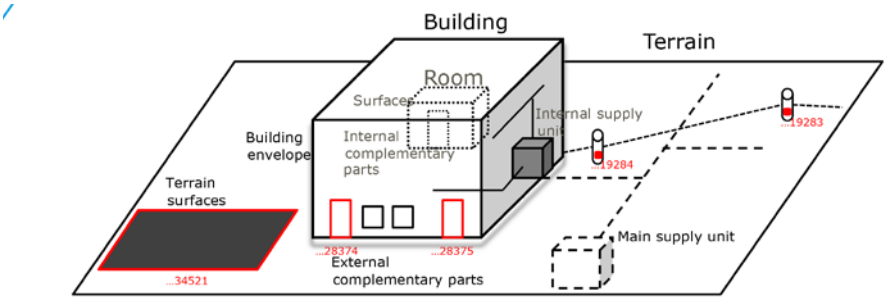
Coding enables locating objects in the models. As an example, all pumps of a specific type that must be serviced on a regular basis can be localised in the BIM model, provided these pumps are similarly coded. Therefore, coding of objects and the presens of objects in the model is far more important than level of detail and precision.

From an OM point of view, rooms and buildings must be coded, but equally important is the coding of all OM-demanding building elements. The OM-demanding building elements are only known if the OM process is well-organised, which is one of the

arguments for digitising the OM process first. Ironically, many OM-demanding building elements are often absent in the models. Especially parts that are included in system deliveries such as elevator and escalator systems, blind systems, façade systems and BMS systems, are often absent in BIM models.

Figure 2 below illustrates a combined GIS and BIM model where codes for the objects representing pumps in pump wells, external doors and a parking area, are shown. All these objects are relevant when seen from an operational perspective.

Figure 2. Example codes for building elements relevant to OM in a combined GIS and BIM model

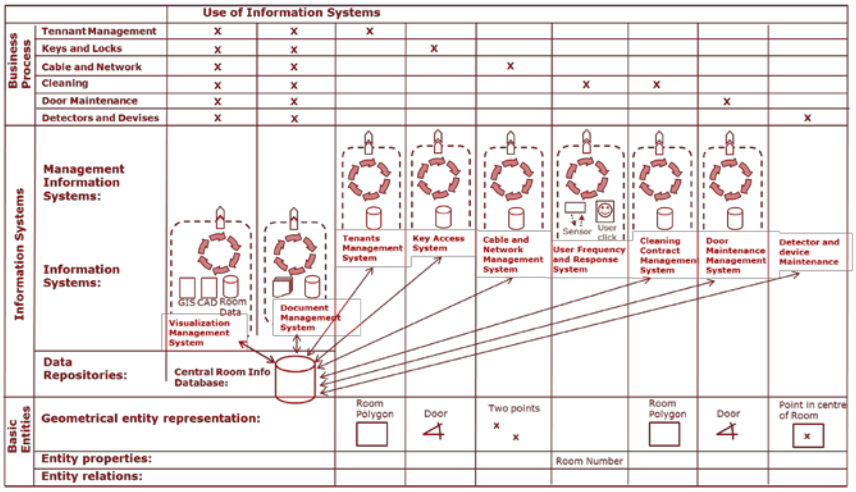


Digital coherence of OM processes, physical buildings and virtual buildings

The full value of digitisation is achieved through coherence. Coherence is, among other things, achieved through interoperability, which enables the exchange of data between the digital entities. Figure 3 shows an example of coherence between digital OM processes, digital physical building elements and the digital virtual building elements in an FM department in a specific company. The top rows show examples of some OM processes that are handled by the FM department. Each individual column in the figure represents an information system that supports one or more of the OM processes (shown with check marks in the top rows). The bottom rows show examples of representations of objects in the digital virtual building. The OM process, access control (Keys and Locks) is supported by the information systems' Visualisation Management System, Document Management System and Key Access System. The connection between the information systems is ensured by a shared room database shown at the

bottom to the left in the figure. Key Access System is represented in the digital virtual building with coded instances of the object, Door. An example of a connection to the digital physical building is seen in the column with the information system, User Frequency and Response System, which gather data from movement and thermal sensors and from user response panels.

Figure 3. An example of coherence between digital OM processes (e.g. keys and lock management), digital physical elements (e.g. electronic door locks) and digital virtual building elements (e.g. door objects)



For various organisational and technical reasons, you cannot expect that all digital systems in an organisation can be connected. The previously mentioned FM department also attends to several other OM processes, some of which are mentioned in Table 1, where the information systems that support these operation processes are specified. Some of these information systems are deliberately not connect, as the systems shown in Figure 3 are. This is because of security considerations, silo thinking or because it simply does not give added value, among other things.

Tabel 1. OM processes and the information systems supporting these processes in an FM department

FM Business Processes		Information System
Type	**FM area**	
Process Management	Cleaning	Use frequency and Response System
		Cleaning Database
		Cleaning Management Inspection System
	Maintenance	Maintenance System
		Mechanical Maintenance System
		Cable and Network Management
		Preventive Maintenance Management System
		Call Centre System for Error and Maintenance Management
	Access Control	Key Access and Lock System
	IT	IT Service Management System
	Fire Safety	Fire Safety Management System
	Construction	Building Project Notification System
	Real Estate	Real Estate Tenant Management System
	Economy	ERP
Data Management		Central Room Database
		CAD GIS-based Visualisation and Management System
		Document Management Systems

Potential value growth within the digital main areas

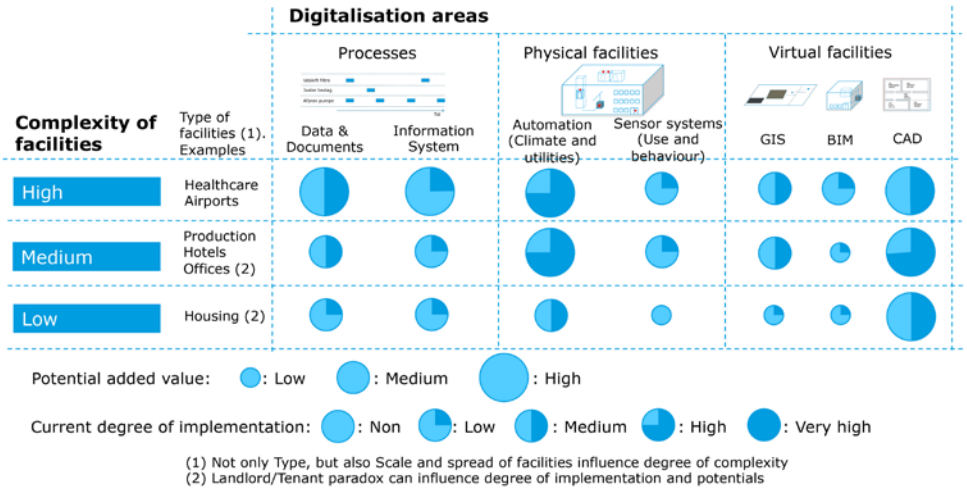
Where does it give the organisation added value to use resources on further digitalisation in the building operation area? This is a question many FM managers often ask themselves. Help for the clarification of this key question may perhaps be found in Figure 4. In the figure, the author's assessment is shown of the potential value growth from digitalisation within the three main areas: digital processes, digital physical buildings and digital virtual buildings. Each main area is sub-divided. Thus, the digital process is divided into, partly, data and documents and, partly, information systems. The digital physical building is divided into automation and sensor systems respective-

ly. Finally, the digital virtual building is divided into the model types; GIS, BIM and CAD. For each main area (column) the potential value growth is shown as low, medium or high. Also, the extent of the current implementation, divided into low, medium and high and very high, is shown. The assessments are made for three levels of complexity of the buildings. Note that not only complexity plays a role, but also the property portfolio's size and spreading. In addition, be aware of the tenant/owner paradox, i.e. that the owner and tenant may have vastly different interests.

It can give added value to an organisation to digitalise areas with a high potential and a low degree of implementation. Thus, it can often give great value to a FM department at a hospital (complex buildings) to digitise an OM process, which entails getting data and documents regarding the OM process structured and introduced into a CAFM system. On the other hand, there is perhaps no big gain in further digitalisation of the automation of the climate and utilities area. Finally, the same hospital should subsequently establish CAD-based digital virtual buildings, e.g. in the form of CAD floor plans. These CAD models can support certain digitised operation processes.

Figure 4. Potential value growth and degree of implementation of the three main parts in digital building operations

Value concepts

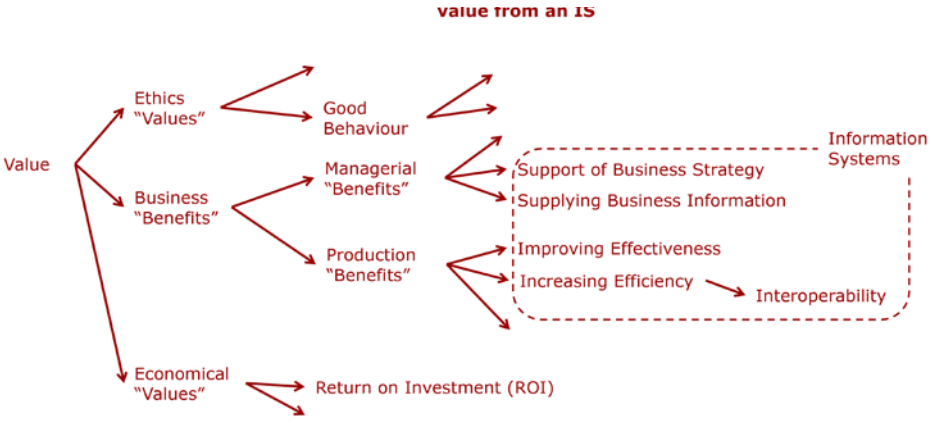


The concept, value, can have many meanings and be used in many different contexts. In this chapter alone the concept is used several times. Therefore, the following provides a brief introduction to the value concept, seen in a business and digitalisation context within the FM area.

An attempt has been made in Figure 5 to illustrate the meaning of the concept, value, depending on the context in which it is seen. In ethics one can find some value definitions and understandings. For example, that we should be kind to each other. Within the business area you can divide value according to what, offhand, has value for management (managerial benefits) and what is of value for production (production benefits).

An information system may give managerial benefit/value because the system can support the business strategy or can provide management information. Within production (including production of FM services), information systems can often contribute to increasing productivity and to improving the effect. An example of how an information system can directly increase the effect of a production apparatus is when the interoperability (ability to exchange data between systems) is increased.

Figure 5. Value tree with selected value concepts and dimensions. Information systems are often used to support value dimensions shown within the stippled frame



Value dimensions in the previously mentioned context can be regarded as:

1. Increased productivity (same result with fewer resources)
2. Improved effect (better result with the same resources)
3. Support of selected strategy objectives (initiatives that help selected strategy objectives on their way and which do not necessarily increase productivity or effect, except for the effect that the strategy objective is supported)
4. Improved management information (gives management better opportunity to think strategically and long-term, but does not necessarily increase productivity or improve the effect, and does not necessarily support strategy objectives that have already been decided)

Support for the company's objectives to appear green and sustainable can be regarded as belonging to the value dimension, type 3, above. Establishing a thoroughly prepared digital basis, which makes analyses of e.g. the property's condition or possible space distribution, can belong to value dimension type 4. Finally, the introduction of an IT system for the planning and management of operation and maintenance can, in certain cases, improve the effect (type 2) of operation and maintenance.

TRINE THORN, Nordea Denmark. Trine uses her background from People, Marketing and FM to create an attractive workplace. By creating coherence between the company's culture, business and physical space, a unique Workplace Experience is created that accelerates employee performance. Trine uses, among other things, the tools that create good customer experiences, to create good employee experiences – Colleague Centricity. Trine is a member of the Advisory Board for "Tomorrow's Meetings" and a member of the DFM Networking Digitization Committee.

Future Facility Manager

Creating culture in a digitized world

Summary

What responsibility should the future Facility Manager take when digitizing challenges the company that you are a part of? Should one continue to focus solely on optimizing its operations, or are there other ways of creating added value for the company and helping to ensure the company's survival and progress? How can you be visionary and business driven? And should you still be a support function or a more integrated part of the business?

Digitization contributes to companies' business models being disrupted. Companies are trying to find a new foothold and redefine themselves to survive. Their products, processes, services and organization are reconsidered. One of the consequences is that the company needs to attract a new kind of employee.

Businesses need to create a completely different workplace. A workplace that accommodates the new ways of working is much more flexible, digital and agile, so it follows business development. At the same time, the workplace must meet the employees'

demands to an attractive workplace. The companies are competing for the same employees, as companies across industries seek the same competencies to handle the great pressure of digitalization. They want to create a workplace that addresses the ways in which employees handle the digitization, not only in their work life but also in their daily lives. The companies want to create a unique corporate culture.

The Facility Manager of the future must therefore be a community creator, who creates the culture for the company and thus encourages cohesion. When the companies undergo major changes due to digitization, there is a need for someone to create the framework for breaking down the silos and creating lateral networks. This increases productivity and momentum.

We must move from being a service provider to creating a corporate culture through unique experiences, putting colleagues in the center – Colleague Centricity. So it is not only business results that you as an employee are proud of, but also the culture that the company has and the community you are a part of. Thus, we create the necessary added value for the company.

The Facility Manager must expand his vision of the workplace to not only include the physical space, the physical building. The workplace physics is digital, it is on the phone / PC so it follows the employee all the time. It will be the future Facility Manager's task to embrace the company's culture all the way to the individual employee, when the employee is on holiday and during the employee's transport. It's no longer called Work Life Balance but Work Life Integration. A community must be created that links employees across the company and strengthens the loyalty of the company. The facility management organization must be ready to service this 24/7 and create unique experiences. We are hence undergo a change from Facility Managers to community creators.

This chapter opens windows on the nature of future employees. We shall take a closer look at the ways in which digitization affects the employees' demands and wishes regarding their workplace and the service it offers. There will be examples of how you work in a structured approach with colleague experiences and thus help to create the company's culture – the future community. The chapter will offer various ideas on how to change from being a Facility Manager to a community creator.

It is an exciting journey, and it has just begun.

Future employees make demands on facility management

Digitization has increased the competition for the specific type of employee. No matter which industry you are in, you want employees with the same skills and profiles. A good example of this is banks, which previously mainly employed co-workers with a financial background. Now, the main focus is on hiring data – analysts, programmers, physicists, management consultants and the like, all of whom can help the financial sector embrace the digitization and meet the wishes of the customers. Customers rarely come physically to the bank. Instead they want to serve themselves in online banking, pay with MobilePay, invest via their online banking and only in specific cases do they want help from bank advisors. The financial sector therefore suddenly competes with pharmaceutical companies, web agencies, consulting firms and companies like Just Eat and Airbnb for the same employees. Digitization has made it even more necessary to stand out as a workplace.

Digitization means that the companies' business model changes much faster than before, and that on an ongoing basis new employees must be recruited to bring other competences and new insights to the company. The need for the number of employees is thus changeable. You need to create a scalable organization. Projects will start and they will run briefly. Projects work across time zones with groups of employees around the world who do not physically meet. The companies will hire employees on temporary contracts to create the scalable organization.

This will create new types of employees. Employees who are employed a few months with each company, and who thus experience very different corporate cultures. These employees want to be offered all the best from each company and expect to get it all. They are impatient and want to move forward. They want to experience something.

They want to go for businesses that they think are interesting and purpose-driven. Companies that want to change the world and who take social responsibility seriously. The employees are not loyal to the companies, but loyal to themselves and their own values.

At the same time, the companies will also consist of employees who have been long in the company. They are far more loyal. They will of course be inspired by the new employees and gradually want the same level of service, the same interior design, etc.

All this places great demands on facility management. You must be ready to create scalable buildings, and digital solutions that can support work activities across countries, including services that work 24/7 and meet requirements of the very different employee groups. It is therefore important to find the digital tools that can support facility management in delivering the above effectively and thereby increasing the productivity of the companies.

Companies must create a culture that is unique and can win the competition for the coveted employees. Facility management must take the lead in this task and ensure that the facility management organization also reflects the path the company is taking. Facility management must show that one understands the needs for swift change.

So even though companies for decades have been talking about being the attractive workplace that has the ability to retain and attract the right employees, this competition parameter has not diminished with the digitization – on the contrary. Digitization requires people with both business understanding and digital skills.

As a Facility Manager, it is important to understand the employees of the future and respectfully take care of the current employees. Because it is the company's task to embrace it all.

Trends in society shape the requirements for service at workplaces

The world is changing. In the workplace the employees expect to find a reflection of the changes that occur in society. So when everything goes faster, you expect the same pace of the services provided by the facility management organization.

Some of the main trends in the external world are:
Individualization
High speed
24/7
Convenience
Transparency
Involvement
Sustainability
Community
Health

Products become more individualized – customers participate in the design process, so the product will be very special to you. You expect that when you order a pair of shoes at night, they will be delivered the next afternoon. You expect that you can chat with your bank in Denmark when you are in Hong Kong and cannot get your credit card to function. You expect to get ready meals delivered to your doorstep. You expect to be able to compare the prices of services in portals that quickly guide you to the right choice for you. You expect that all mail is delivered electronically. That your books and newspapers are available electronically and that you acquire knowledge through TED talks or podcasts. When you sit in the car, keep yourself updated with your friends by giving them a call. You talk to your family across the ground via Skype so you can still see them and share experiences with them in real-time. You watch TV when you want, and choose the series and programs you want. You expect the supermarket to know you and send you a proposal for next week's food plan, which is based on the purchasing pattern you have had last month. You expect the coffee shop to know you always drink Americano with a little bit of hot milk. You pay for items with your phone.

When you have a problem, you post it on portals where everyone can comment and help you solve the task. If you need proof reading of a book, then you post it in the evening, and the next morning there will be feedback from people in other parts of the world who want to help you. The same goes for the companies. Previously, the companies kept the challenges in-house, now they are released to the public so that others can help solve them. You co-create and give credit to those who have come up with the best solution. So previously, you had a lot of co-workers employed. Now you

upload challenges on the web and get them solved by experts, the company would otherwise never have interacted with.

The digitization has radically changed the tools you formally used to solve your tasks at home and at work. Moreover, the timespace compression brought about by digitisation has increased the speed at which information has become accessible for data collection and intelligent use. The comprehensive global digitization will inevitably change our behavior and expectations.

With digitalization, many things become easier, but at the same time, many experience that they are pushed by the speed, as they have to keep up with the clock. The working day is fluid. It is no longer about Work Life Balance, but about Work Life Integration. You try to create a connection in a day when work and private life flow between each other. You want it all and find it difficult to make choices. Therefore the employees to a greater extent expect that the workplaces help them with practical issues.

These trends place great demands on the facility management organization. It is expected that we know our colleagues' individual needs and meet them, and preferably before they even think about them. They expect to get help 24/7 and preferably via an APP. They take for granted that we have systems that send them a notification when we see that they have not been in the canteen and ask them if we should put food aside for them. They appreciate that the canteen becomes a food court where you are inspired to try new dishes and that the premises are open when it suits you. To this type of employee it is second nature that we involve colleagues in our thoughts so that they can help create the solutions. That we find out how we can use all the data we have on the employees of the company so that it creates value for the individual. That we offer services that you previously managed outside the workplace, but suddenly can get solved at work, e.g. a dentist, a hairdresser and a dietician. At the same time, one expects that a rebuilding of the physical workplace will only take a few days, that you have influence on the interior design and that it can be redone during the day so that it supports our very different ways of working. That we also offer services that you can use when you are not working on the company premises.

We need to help employees and companies to create health in the workplaces by integrating various types of health interventions. Because when everything happens very fast and can be solved easily and effectively, many become worried about their health. They can see that a hectic life draws on their resources. They realise that they are not getting enough sleep, not get enough exercise and eat unhealthy food. Therefore, "extreme" sports like cycling in the Alps or the exact opposite: walk the Camino. We need to help our employees choose the healthy lifestyle. We must offer solutions that they can use during the day. It can be a room for a power nap, a vegetarian corner in the canteen and healthy lunch boxes for their children that they can take home. We must send notifications that they must move when we can see through sensors that they have been sitting for a long time.

When everything becomes as effective and customised to who you are, more people crave experiences, storytelling, attentive presence and spending time with other people. When you go to a restaurant, you do not want a la carte, you want the restaurant to create an experience and determine the menu. One does not sit at one's own table but at long tables mixing with others to get to know them. The experience is shared along the way on social media, and you give feedback immediately, even when you are dissatisfied, so the whole world knows it. It must be something special. We want experiences that move us and give us something new, something we can relate to others.

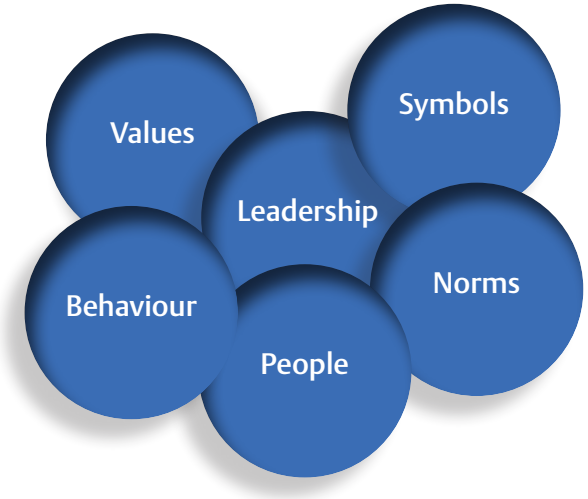
This requires new cognitive approaches in facility management. We should not focus on the individual service; we must raise our eyes and see the larger connections and in a broader perspective. We must look at how we create value for the individual and thus the company. We must create experiences at the workplace that you want to relate to friends and family; thus, we help the employees to tell stories about the workplace and thereby lift the company's reputation. We need to be better at telling what we do and creating stories about it.

The workplace of the future must have a strong corporate culture

Companies embracing the major changes that digitalization brings about in the organisation and amongst its employees need to create a strong corporate culture. The

culture should reflect the individual company, so that it differs from others and can be attractive to future employees. A culture that can be felt both in the company's external image as well as internally, when you become part of the company.

The company culture is created by:



- The symbols are the physical things. The buildings, the furniture, the location and how we organize the business.
- Values are set by management. What will it be known for?
- Behavior and norms are the way we carry on in the business. How do we work together? How do we communicate with each other and how do we relate when we do not work?
- Management, how is the company's People Policy? How do we manage our employees? How do we develop our employees?

Most importantly, the culture is created by the people who work in the company, but they are strongly influenced by all the elements described above.

The facility management organization has the responsibility and opportunity to drive the creation of the company's culture. With the physical framework and the services, we offer, we can show what the company wants to stand for. We can break down silos

and create greater cohesion. We thus support the major changes that digitalization brings to the company. We help to create a unique community.

From workplace to community

Today, employees work everywhere. They do not have a permanent place where they belong. They can work from a café, in the train, in the bus, while waiting for the children in the sports hall, on the sofa at home, in hotels and at the company. Everything is possible by virtue of the new technology. So, it is for the company to create an experience of working for the company, no matter where you are. Because it will continue to be important, as a company, to create an employee loyalty – an affiliation. It will be important to make sure that the employees want to do something special for the company and do not rush to move on to work for competitors. So, companies need to expand their "space" and they must embrace the workplace in a far greater perspective. So, when an employee chooses to work from a holiday apartment in Thailand, there will be services, artifacts and symbols that ensure that the employee feels that she has now "checked in" in the company. The same is true when working on the road or in the public space. The culture is created on the phone, the iPad, etc.

It's about creating communities. Communities where you meet because you want to because you have something in common that extends beyond solving a task. You are not just there to work as you do in a traditional workplace. You are there because you want each other, have more common values and common interests. You are there because you can help each other improve your performance and lift each other to a higher level. It is a formal network that is governed by the same interests.

From workplace to community

From service to collegial experiences in the future workplace

When workplaces and employees change, it is important that the service offered in the workplaces adapts and helps to create the desired corporate culture. Hence we must look at the management and the creation of future service in a new way. The future service is based on the culture that the company has and its potential for development. Therefore, some service is right for one company, while another company needs a different concept. It is important that your strategy reflects your communication in terms of what you want to create.

Traditionally, many workplaces have distributed their services into service lines – be it cleaning, technical maintenance, handymen, reception, canteen, and guard service. Each service line optimizes its domain and ensures that optimum service of the desired quality is delivered. There is limited use of resources across service lines. The company and employees will basically get the service they traditionally expect.

More and more companies are moving towards an integrated service, where you choose to look at all services as a single service. This means that you can use the resources across the organisation and optimize the company's economy. This will provide a better service experience for the employees in the sense that for instance the cleaning staff changes a faulty light bulb, so the co-workers do not have to order a handyman for that purpose.

In both cases, the services are considered specific deliveries. The approaches have an inside out focus. The service organization looks at the best way to deliver the service, i.e. there is no focus on the employees in the company, but on how to optimize the service organization, so you get more value for money. This does not mean that you do not focus on quality. You also listen to the company employees via user panels, but the focus remains on the individual service. This can be controlled with an input- or output-based focus and can of course also be controlled via employee satisfaction surveys, where the satisfaction with the individual services is mapped.

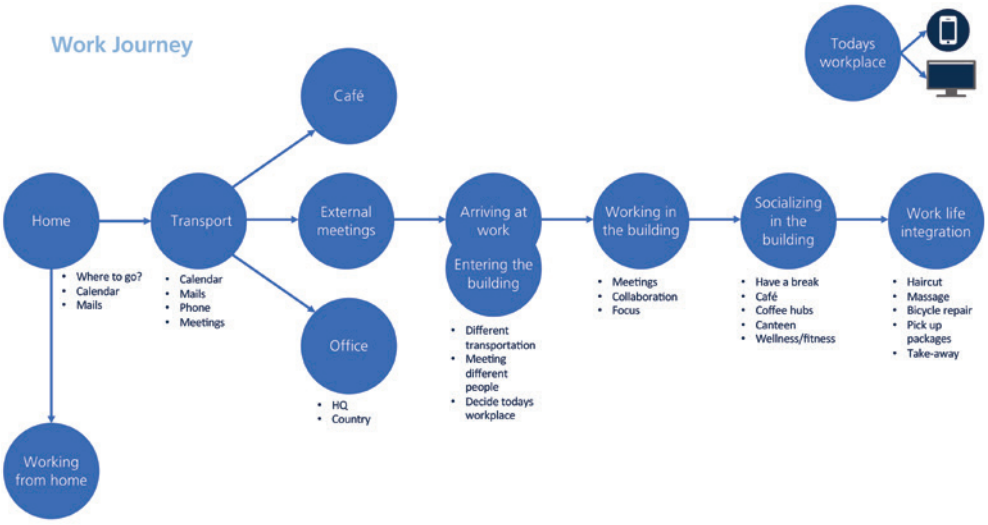
Instead of focusing on the service and its delivery, one can choose to look at the kind of experience the company wants for its employees – colleague centricity. Thus, the focus and method of achieving employee satisfaction changes. The service delivery itself becomes just a part of the experience and may need to be performed differently to be experienced in another way. This gives you the same mindset that many of the companies have in their business models, where the focus is now on customer centricity – customer experiences.

Facility management must use the same method that the company applies to integrate customer experiences. Here, the company maps all its contact points with the customers before, during and after the customer's purchase. The company ensures that customers get a good experience at every single point of contact, but also that the experiences are connected. It therefore makes sense if the same mindset applies to the employees of the company. Thus, what happens externally to the customers suddenly gains credibility, because the same process occurs internally in the company. It becomes easier for employees to focus on and provide a good customer experience, when they have practised it themselves during a working day.

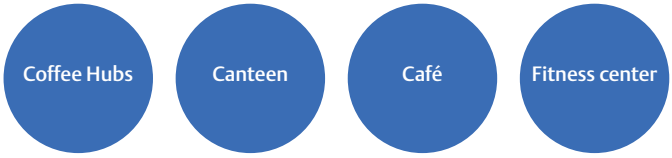
Work-journey – A journey through your working day

To get started working with good colleague centricity, you start by mapping the employees' working day. You map out which "contact areas" the employees have during a working day. In connection with the greater digitization, the working day has changed. The working day starts for many employees already when they wake up. They take their phone and check their mails. Therefore, the work-journey must also

start there. The Facility Manager must therefore understand that responsibility starts much earlier. A typical work-journey could look like this:



In order to be able to work more specifically with the work-journey and be able to initiate measures, it is necessary to break it down into touch points. An example of how to break down socializing in the building into multiple touch points could be:



Once you have done this, you must make clear what experience the company wants to create in the different touch points in order to build the culture. You have to ask yourself the following questions:

1. What experience does the company want when employees “Socialize”?
   E.g.:
   - The company wants employees to meet informally in order to get to know each other better so that they can cooperate better. There must be opportunities to meet across the organization so that silos are broken down

2. What parts of the brand and values do the company want to be visible?
   E.g.:
   - Cooperation
   - Sustainability

3. What expectations do the employees have to "Socializing"?
   E.g.:
   - I would like to relax a bit before the next task. I would like to do this alone or with colleagues.
   - I'm hungry
   - I need to smoke
   - I want a better work-life integration

4. How will the company use the touch point "canteen"?
   E.g.:
   - Healthy organic food that provides energy for the rest of the day
   - Local focus on the food we use in the kitchen
   - Presentation of the food to make healthy choices
   - Informal dining environments, that create a different sensibility. Environments that can also be used outside the canteen's opening hours
   - Food that you can take home as a snack before leisure activities
   - Etc.

By using this method, you structure your development of experiences and ensure that they support the company's culture without becoming incoherent services.

The virtual workplace – work is done everywhere at all times

In the old industrial society, you worked most efficiently at your usual workstation, where you had the right equipment and routinely optimised your work processes. But with the digitization, the technical possibilities to work from anywhere and at all times are so good that it has become an open question, where the employee can make the most of his working day. The daily work journey will, for more and more people, be a

mix of solo work and interaction with customers and colleagues that you meet physically at the usual workplace, and interaction with customers and colleagues that you meet digitally at the virtual workplace.

For the Facility Manager, this means that the work field is expanded from the physical to the virtual workplace. This requires knowledge of both work processes and a conceptual approach that can accommodate that the "workplace" is not a place, but a function. Advising and/or taking responsibility for both the technical opportunities and the advantages and disadvantages associated with the traditional and the virtual workplaces respectively, requires new professionalism. And for most people it will require a closer cooperation with IT and HR.

The think tank "Meetings of Tomorrow" has worked out the advantages and disadvantages of the digital-virtual meeting versus the physical meeting. The think tank's work is primarily aimed at "meetings", but can largely be transferred to all kinds of team collaboration at the workplace and between workplaces. The think tank can thus provide a framework for activities and processes that a company can advantageously construct. In this framework employees can meet physically, and activities can be placed in a digital collaboration forum. The same logic can also be used to determine where departments and functions should be placed, so that they can easily meet physically, and which departments and functions can co-operate more on a digital basis. As a Facility Manager we should take responsibility for the "meeting", regardless of whether it is physical or digital.

A key concept for meetings, whether physical or digital, is "trust". An effective interaction at a workplace requires that there is trust between the people involved. If there is confidence, the collaboration can take place both digitally and physically, and you may even add that when confidence is high, it can overcome inappropriate frameworks.

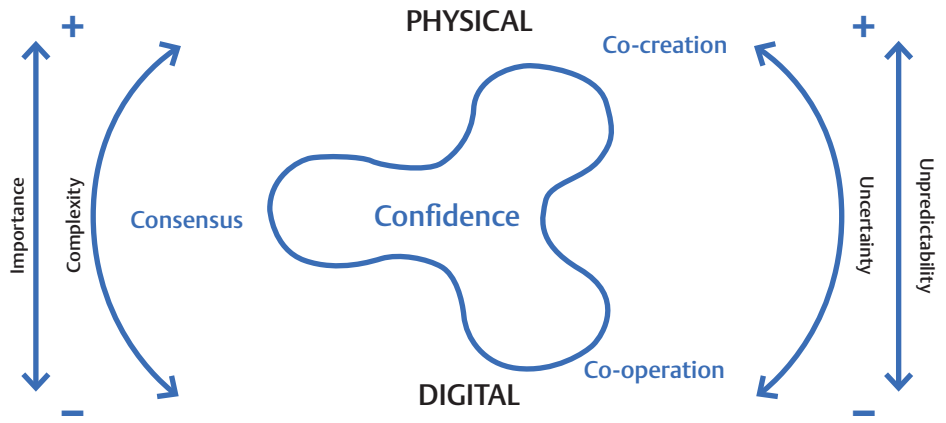
Next, it is important to distinguish between different types of meetings, since the meetings may have different purposes:
You want to create something together – **Co-creation**
You want to inform each other – **Co-operation**
You want to agree – **Consensus**

Where two or more are to create something that neither of them can create alone, it seems the physical encounter could be beneficial.

If two or more just need to inform each other about how far one has progressed in a delivery or a project – and where the cooperation hence is an operation – it seems that the digital interaction is sufficient.

Many meetings and conversations in a company aim to clarify whether we share the same views on a given issue. It can be anything from the big picture to an academic assessment of a specific problem. Whether such brainstorming can occur digitally or requires a physical meeting depends on the situation and on the following points to be considered:

- **Digital tools**. The better and the more convenient the technical platforms are, the more such issues can be transferred to the digital meeting.
- **Speed**. Speedy communication will be much faster to establish digitally, unless the relevant group and its interactions are located very close together.
- **Complexity**. The more complex the issues that need collaboration, the more advantageous the physical meeting would seem to be.
- **Relationship and trust**. Physical meetings are more important to support relationship building. This Is essential when you do not know each other, e.g. when the project starts up.
- **Uncertainty / unpredictability**. The more unpredictable a workflow is and the more uncertainty there is about the framework, the greater the likelihood that a physical meeting will be the best approach.
- **Resources and costs**. The more physically dispersed the companies are, the more costly the physical meeting becomes. Like in all other areas, the focus is on balancing value and cost. When the future FM must facilitate both the physical and the virtual company, he must hence have a good understanding of both.



Source: Morgendagensmoeder.dk

The work mode options today can be divided into five main categories:

1. The traditional workplace
2. Work from home
3. Work from public places
4. Co-working
5. Collaboration across locations

The traditional workplace

The traditional workplace is usually our point of departure, so it will not be in focus in this section. But studies of the importance of the workplace in constructing a productive organisation with a strong corporate culture and efficient processes are linked to the classic physical workplace.

Working from home

Giving employees the opportunity to work from home can create a better balance in the employee's life. The employee saves transport back and forth. The time saved can benefit both the company and the employee. However, if working from home becomes predominant, it can also isolate the employee from the community. As Facility Managers, we must hence support the companies in getting the employees to enter the physical workplace or create a virtual workplace, where they meet their colleagues. The work that most people do to some degree involves interaction with colleagues,

and the experience of "a physical proximity" matters in terms of how effective that interaction becomes. Just imagine if the Facility Manager could create an experience of the company's culture on the PC.

When you look at how the concept of the workplace develops, there is a need to develop a management and control apparatus that can also accommodate the concept that work can be done in "all possible places". This goes hand-in-hand with the fact that companies to a still greater extent are organized according to projects and increasingly work across departments and across companies.

The homebased workplace deserves to be a natural part of the activity-based choices that one has as an employee. But on the other hand, there is hardly any reason to expect an exponential rise in the number of homebased workplaces.

Work from public places

In most places across the globe cafés, trains, and airplanes have internet connection, and hence you can work from most public places in the same way as from home. There are virtually the same advantages and disadvantages as in the home workplace. Cafés are particularly interesting for employees who have meetings outside the workplace and away from home.

An increasing part of the work is carried out by project employees and advisors with a looser connection to the company. These employees tend to change jobs frequently and may also need to work partly from public places.

So how can the Facility Manager help these employees create an affiliation to the company?

Co-working

The co-working concept encourages people from different companies to connect in office or work communities. For some the point is to reduce the rent, while others want to work in a proactive environment, where it is possible to get inspiration. There is a growing tendency for large companies to deliberately encourage co-work modes for e.g. development purposes. Moreover, co-working creates flexibility so that employees

get as good a framework as possible, regardless of whether they need a working day in Hamburg or Horsens.

All the benefits associated with the super-sharp, carefully prepared traditional workplace can in some situations only be a disadvantage. If the work we initiate has the purpose of either producing or developing something completely new, then it may be necessary to rethink where the work can best take place. As a Facility Manager, you must usually pay attention to whether the work processes that you need to facilitate are within the usual range or are of a more specific nature, and whether you for this purpose may have to rethink what the right facilitation or curating should be.

Co-working raises questions of security that need to be addressed. This applies to IT security, but also to the selection of companies you want to co-work with.

Collaboration across locations, departments, and companies

The interaction across national borders and destinations is constantly growing. Digitization today allows for a dynamic interaction between people in different countries and continents. The organization must always choose whether the costly physical meeting is needed across destinations, or whether the much smaller resource-intensive virtual workplace or digital meeting is sufficient. For example, the research-based companies will often have developmental co-operation with universities and researchers who may be on another continent. There are very large resources in facilitating this work, enabling a large part of the interaction to take place virtually. An increasing number of companies will need to formulate policies for what kinds of work is to be done in the traditional analogous workplace, and what solutions should be created in the virtual workplace. Such policies should balance both cost, complexity and uncertainty.

Control and measurement of colleague centricity

When you start looking at experiences instead of at service deliveries, it also means that you have to change the parameters you measure. For now, it will be interesting to measure the satisfaction with the experience of the work-journey, and not the satisfaction with a single service. It is not a single service that affects the outcome; it is the whole experience of the working day.

As a Facility Manager, you must expand the horizon and be aware of the fact that you provide an interaction between service, physical and mental working environment, digital tools, etc. You are responsible for these domains, which to the employee create a coherent experience of the work journey.

However, as a Facility Manager one must not only look at the satisfaction with the work journey to see if one creates value for the company. You also need to look at companies' image analysis and look at analyses regarding how attractive the company is as a workplace. You must also keep an eye on the extent to which the colleagues share experiences on social media in order to see whether your facility management organization helps to create the good stories about the workplace.

The Facility Manager works systematically to secure a continuous experience that creates the culture the company wants. Now, the focus is no longer solely on providing service, but also on the means by which to create experiences that shape the company culture. In these ways we create value for the company by attracting the desired employees in a digitized world.

The Facility Manager of the future has become a community creator in a digitized world!

ANDERS MUSSMANN, EY. Anders has several years of experience in project management and change management within facility management in private companies in Denmark and abroad, as well as in state and municipality contexts. His primary focus areas are work on optimization, streamlining, analysis, and strategy development within REFM, as well as designing and developing outsourcing concepts, business models, supply materials, and incentive structures within REFM.

Organizing in a digital age

Abstract

When you ask yourself the question whether FM is appropriately organized for a digital age, then one should first and foremost consider: How does the organization, of which FM is a part, work and what does it do for its customers? Any FM organization should relate to the questions - why are we in the world, what value do we add to our organization, what is our justification, how do changes in our environment affect the demands on us? When you begin to work on such issues in a structured way, the focus changes from being operational to becoming more strategic - and when an organization works strategically, real value is gradually added to the core business - employees, products, and customers. In order to become an integrated strategic part of the business, FM must be organized in such a way that the function is geared to play along with the other functions - vertically in the organization as well as horizontally between other internal departments.

This also applies to Digitization, Analytics and Cyber (DAC) within FM - and perhaps more than ever before. Digitization and Big Data require that data can be used across

the board, and therefore digitization will contribute to breaking down silo thinking and standardizing business systems across economics, logistics, HR and FM. Changes are not new - digitization is not new either. The new thing is that the speed at which changes occur constantly increases, which adds to the requirements for being able to change.

The consequence of the changes is that the organization of FM internally and in relation to suppliers must fit in with an overall strategy for all support functions. FM is no longer an external device, but a function that interacts for better or worse with other business areas. Domains that were previously analogous are now digitized and disappear from the catalogue of familiar tasks. Conversely, the development also means that new work tasks and processes arise that may not necessarily fit into a traditional silo / department in a company. New tasks and processes may require cross-sectional co-operation and change in order to be implemented, and they could thereby become decisive factors in the organization.

In the following chapters, we will start by looking at how the organization of facility management has developed over the last 15-20 years. This is to understand which mechanisms have affected the organization. Then we will look at what trends and technologies are in the market today, while also making an assessment of whether these will affect the organization in the future. In conclusion, we will make a bid for a future model of the organisation of facility management.

Introduction: The historical development of the FM organization

Approximately 20 years ago the concept of facility management accelerated in Denmark, when a number of suppliers started a vertical integration of services. They identified a market for additional sales to their existing customers. At the same time, the companies were working to professionalize and consolidate the responsibility for delivering indirect services and optimizing processes in the usual functionalist organization.

The result was that service areas anchored in different places in the organization were reorganized, as they were not considered relevant within the framework of the services the organizations were to deliver. The core business was thus more streamlined, which meant that typical facility management services that had been decentralized were now reorganized into an increasingly focused unit.

As a result, the service areas became more visible because the management now had a more consolidated overview of what services they had, the costs, the contracts and the suppliers. At the same time, it became apparent that there was a big difference between what one paid for the same service, and that service levels were not uniform. Moreover, there were differences in the number of suppliers and the time spent internally to manage the area.

This organizations' internal push for productivity improvements, and the vendors' desire to integrate horizontally in order to offer more services to their customers thus became drivers in the organisational change of the facility management domain.

The typical results of the reorganization of the facility management area could hence be categorized as follows:

- Reduction of suppliers, which among other things can lead to lower TCO, greater transparency, etc.
- Reduction of management attention (focus on the core business)
- Standardization across sites, countries and regions
- Flexibility through better options for scaling up and down
- Increased delivery quality
- Cost reductions

The changes resulted in a need for new ways to organize, and there was a demand for new competencies. Management of the FM area thus went from being very operational - daily operation, dialogue with external craftsmen, etc. to include a number of other competences.

Management - included leadership of managers, and often remote leadership of managers located in other locations in a regional or global set-up.

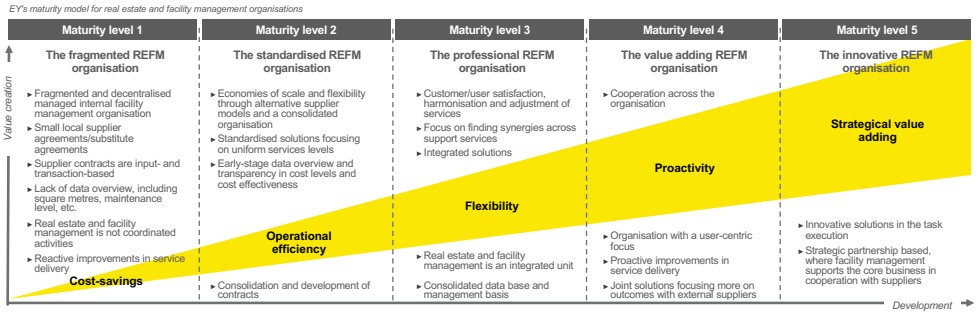
Negotiation - the consolidation involved extensive and often complex contracts that had to be negotiated with a professional counterpart.

Sourcing - involved definition of scopes across services, commercial models and contracts of varying complexity and diversity.

Internal competencies e.g. cleaning and canteen domains were outsourced to suppliers, whereby the remaining task changed from being operational to becoming more tactical, developing, and controlling - often in collaboration with other internal organizations, e.g. procurement.

The figure below shows the typical development that takes place in the maturation of facility management from a decentralized, fragmented organization with no data overview to a partnership level with a focus on value creation.

Figure 1 - Development in maturity levels and characteristics



Source: EY

In recent years, the market has become increasingly professional and mature. Various delivery models have been implemented from a single service strategy, bundled to a fully integrated facility management solution. Key focus areas for development have been the following three questions:

1. Outsourcing or in-house?
2. Scope (geography and services)?
3. Single service, bundled or IFM?

For many years there has been a focus on delivery strategies and on how the FM departments are able to contribute to realizing ongoing, and often significant, savings and ensure efficient solutions. These days there is much more focus on choosing the right solutions for the whole organization. Thus a broad shift is taking place from primarily measuring quantitative parameters to, for example, also considering qualitative KPIs, flexibility, proactivity, and adaptability.

In terms of the organization of the facility management area, this has meant that there is a greater degree of lateral thinking across all levels. This applies to both strategic, tactical, operational levels, and stresses that each FM department must thus contain a broader field of competence in order not only to ensure support for, but also positive impact on the core business.

In order to realize these qualitative gains, there is an increased emphasis on rethinking the existing management models, which primarily took into account the above questions. Now, they have a wider scope and contain several focus areas. These focus areas can be divided into three primary layers:

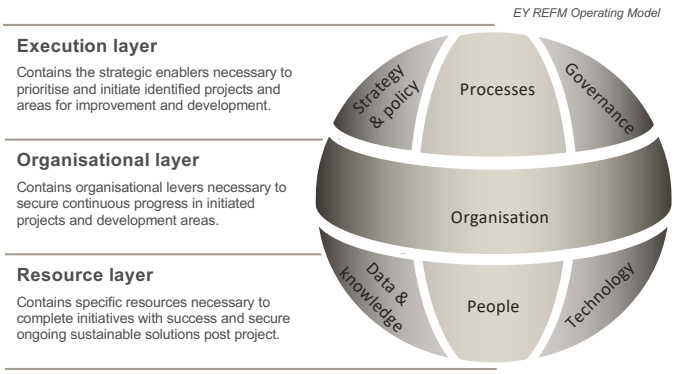
- The execution team, which establishes a strategic link with the core business and sets targets. Future processes are then mapped and goals are broken down into performance targets and KPIs.
- Roles, responsibilities, and mandates are established in the organizational team, including the degree of centralization and the choice of sourcing model.
- Data needs, technological support and existing as well as lacking competencies are identified in the resource team.

The FM department has thus to a greater extent begun to act in more strategic ways, but will continue to address the above questions on sourcing, scope, and geography. A specific selection of the sourcing degree remains important to the future organization, as the choice affects the size of the remaining organization. If you want to have professional insight and develop services yourself, you need to make a decision on the composition of your own organization. This will lead to a greater need for larger internal organization in tandem with investments in the organisation and ongoing upgrading and development.

Finally, a decision must be made on whether the organisation desires an IFM solution. In this model the intention is that there should be as few areas as possible left to be covered / handled. Alternatively, there could be a single service model, where the organisation itself typically is in charge of considerably more functions, including administration, coordination, development and IT systems.

In recent years, the development has in other words gone in a direction where the facility management organization understands the strategic framework in which it works - not just providing services that satisfy the users, but services that support the company's strategic needs. The consequence is that skills and organization in facility management once again change from a more tactical to a strategic focus, where users and customers are central.

Figure 2 - EY's control model for REFM



What trends will develop in the years to come?

The fact that facility management will in the future have greater strategic importance also means that the key factors that companies today use as starting points for strategic and organizational transformations are to a greater extent adapted to the overall goals and values that the company prioritises. This applies to the facility management organizations that understand that it is not exclusively their own facility management budget that needs to be optimized.

This means that an isolated focus on optimizing land, savings, and consolidation of suppliers alone will not contribute with sufficient value to the business. Instead, there is a growing recognition of the fact that the company, in order to achieve sufficient results in further development, needs to challenge the established structures in the functions. Thus, a broadly based support system is developed, which can contribute with appreciable value creation in the form of, for example, reduction of sick leave or increased employee productivity. This will also contribute to direct optimization of a significant proportion of the organization's total cost base.

Employees are a scarce resource - attracting and retaining talent

One of the most important key factors in the current development concerns attempts to attract and retain talent. We live longer, and as a result we stay longer in the labour market. This means that for the first time, the workplace must be able to include four generations at a time, which places immense demands on the company, the surroundings and the buildings, including user experience and digital solutions.

For further inspiration on how the buildings support the framework of the future, see chapter 2 by Gitte Andersen, Signal.

For further insights into the development of employee centricity in a digital age, see chapter 3 by Trine Thorn, Nordea.

New models are needed to facilitate value creation

New business models provide the foundation for the development of the factors mentioned below, be it within energy efficiency, asset and facility management, smart buildings and smart cities. The development of new business models needs to address the exponentially increasing technological developments we have seen in recent years.

This is done to provide the best support for the new technologies, thereby maximizing value creation for users and customers - basically the foundation of any facility management organization.

The greatest impact is therefore expected to occur within user-centered and outcome-based service solutions, where, as described above, the user's satisfaction and experience are in focus. This is facilitated by new cooperative models for partnership and loyalty-based economic contract structures. By using these new models, businesses and organizations can support the core business in the best possible way and, if all goes well, also influence several key elements such as efficiency or sickness absence in a positive direction.

The users are included as quality targets for the deliveries

It is especially in relation to the servicing of users and customers that the development within facility management graduates from being a support function to a much more comprehensive service, acting as a supplier of supporting solutions that ensure a better experience in and around the workplace. User satisfaction is hence an ultimate quality target, where any external supplier is measured and remunerated according to the ability to deliver quality at the right price. This is part and parcel of the acknowledgement that facility management is here to support the core business and that users are a key element in this momentum.

In this context, it is also the tendency that facility management collaborates and coordinates with other support functions (especially IT and HR) to ensure a good, smooth user-centric experience.

Productivity overrides efficiency as the primary goal of the employee

There is currently a general shift from looking at efficiency as a benchmark for value creation to a greater focus on resource utilization with the highest possible return. This can be in relation to reducing stress and sick leave, higher general employee satisfaction, etc.

It is no longer sufficient to look at how much can be achieved, but instead the focus should be on whether what is produced provides sufficient value for the individual and for the company in general. More time is now spent assessing whether the task's final value could be optimized in relation to the work effort of the execution.

From annual budget considerations to total lifetime costs

From having previously focused on pure cost reductions, recent years have seen a shift to consider the need for major adjustments of, for example, use of the building mass based on a total life-time principle or a total cost principle, TCO. The shift is still developing in Denmark, and companies, public and private, continue to operate and maintain the buildings based on short-term budget considerations. One change, however, is that the focus is now more on prioritized risk assessments. Thus, the focus is more on spending the occasionally limited budgets on the highest priorities instead of just doing quick fixes.

Sustainability and the environment should market the company in the surrounding world

Sustainability is a key element in the shift from initially looking at the cost and efficiency considerations to focus on the value-creating productivity of the business. This applies to sustainability in a broad sense, as companies have become far more environmentally conscious in terms of production and footprint, increasingly focused on the employees' physical welfare, and much more focused on the use of environmentally friendly products across the business.

A consequence of the shift is that companies and organizations now increasingly use their positive results to brand the company in terms of e.g. the environmental impact. This also contributes to making the company attractive to both investors and employees.

The company's data and brand must be protected

Brand protection is a necessity now more than ever. It is a completely natural development for companies and organizations to use their brand to attract capital to a greater extent. Since this has become a much more strategic tool, brands have become more vulnerable to negative publicity. As a consequence of negative news being spread extremely rapidly through social media, protection of the company's brand and identity becomes increasingly important.

The same development is seen in the context of data protection, but to a much higher degree. Data protection is now a fundamental element that companies must take seriously and actively embrace.

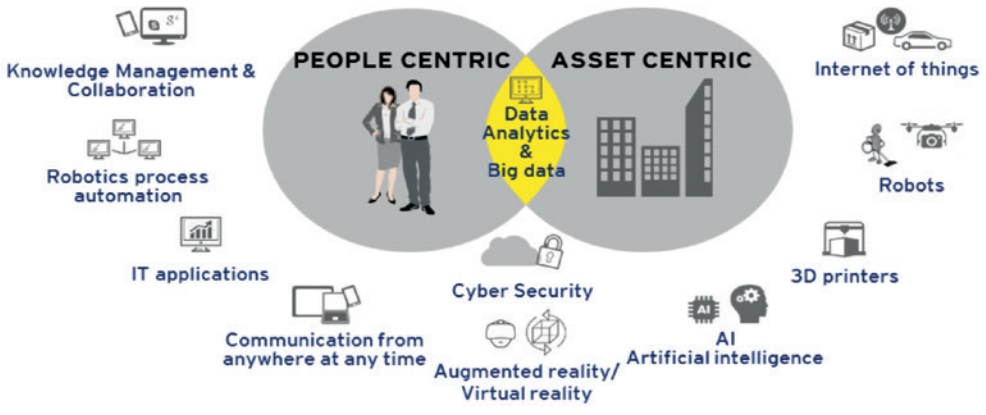
The Digital Agenda: Digital, Analytics and Cyber (DAC)

Digital solutions create both opportunities and challenges in facility management

In the course of the next few years our workplaces will undergo drastic transformations, driven by changes in employee demographics, new technological devices and new ways of working. The convergence of these trends creates a unique opportunity for rethinking organizational strategies within facility management. It is now time to create a new generation of organization and workplace, which are value-creating and supportive of the core business.

The figure below illustrates how the digitization, analytics and cyber technologies can be centred around either the employees or the physical assets. The various technologies each contribute their unique features and innovative solutions, which with the right strategy and implementation can enable facility management to support the core business and thereby create value. This can, for example, help to adapt service deliveries, implement process optimization, increase employee engagement, facilitate management reporting and follow-up requirements, ensure better utilization of square meters and new communication channels, CO^2 reduction and better control of the company's assets.

Figure 3 - Technologies that can be used in the REFM domain



Source: EY

One of the key elements we consider as having great potential for impacting the driving trends (discussed above in section 3) is knowledge management. The reason is that knowledge management to a very high degree is cross-sectional and can thus have effects in several areas.

Knowledge management

Quite a few organizations experience knowledge management (KMC) as a challenge, and they therefore seek to integrate it into facility management solutions. This is done with a strong focus on the users' needs, often addressing communication opportunities as an important factor in the ability to cooperate and work efficiently. The right digital solutions help solve the challenges.

By providing easy access to various communication channels, which are always available wherever the employee might be, you support the organization in the creation of a flexible and efficient core business.

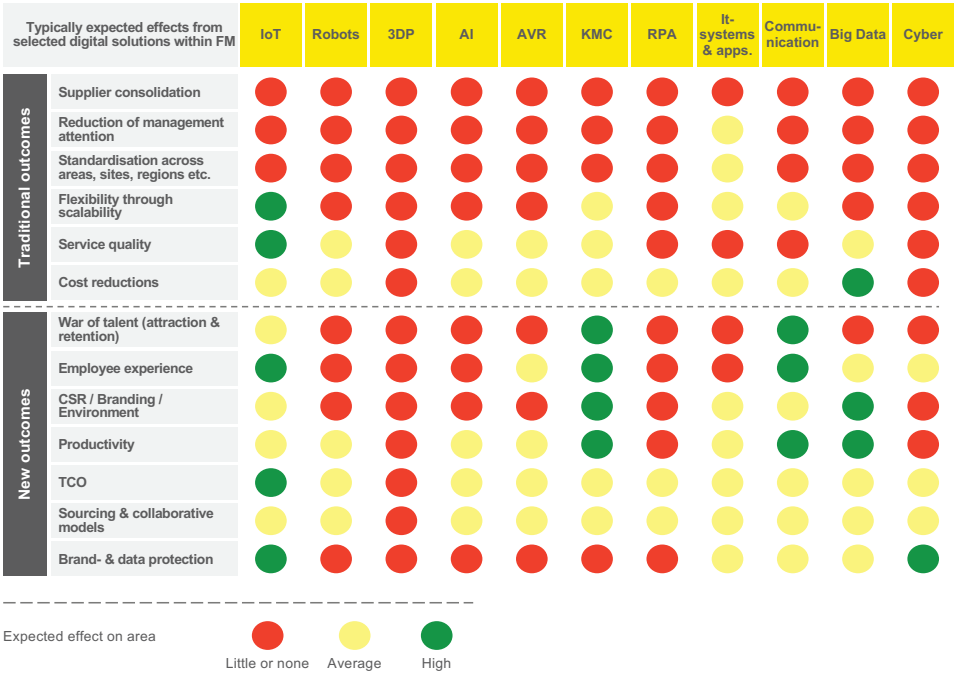
To give an example, 91% of the participants in a study conducted by EY in 2017 feel that REFM has an obligation to contribute to the development of knowledge management and collaboration within the organization.

Increased focus on flexibility and agile work abilities blurs the boundaries between work and home. Software that supports a collaborative culture should enable people to work seamlessly across platforms, devices, and locations.

Effect of new technologies

The figure below shows an indicative correlation and effect between typical key factors (outcomes) for facility management and the new digital solutions.

Figure 4 - Possible effect of the new technologies on the typical desired FM benefits



Source: EY

The assessment is that IoT, KMC, Big Data, and communication anywhere and anytime has the potential to have the greatest impact on the typical desired outcomes of a facility management organization.

By way of example, IoT could be a driving force combined with CSR and a strategy that facility management must represent an organization that focuses on environment and sustainability through energy-saving initiatives. IoT can also act as a driver for organizing facility management after a TCO and an intelligent asset management thinking with risk management and life cycle perspective (cradle to grave principle) in the centre.

KMC, which supports learning, knowledge sharing and collaboration, will contribute to increased productivity, lower costs, a mobile workforce, and create a culture of innovation supported by employee engagement.

General challenges of the digital solutions

When implementing digital solutions, there are continuously new central challenges and issues to address. Discussions on the handling and security of sensitive data using sensors, what data collection leads to, and what systems should actively measure and collect data? How should investment needs be prioritized in relation to other critical areas of the organization? Moreover, new technology often leads to high expectations from users, which can be difficult to handle and honour. Hacker attacks and IT crashes are a major risk factor. One should therefore add digitization as an element in the company's facility management strategy and prepare it jointly with IT.

Cyber: in terms of transformation using digital solutions as levers, a well-developed strategy and competence building within cyber security is essential for brand and data protection. Facility management is often a gatekeeper for the building and its employees. For example, 2017 studies conducted by the EY for a number of Nordic organizations, show that:

33% find it unlikely they would be able to detect targeted and complex attacks

74% consider careless employees as the primary entry for cyber attacks

56% say that the lack of the right expert reviews in the digital area challenges data security and its value to the organization

It is therefore important that there is a cross-sectional collaboration between IT and FM. In addition, it is crucial that there is a clear structure and process for controlling the service providers using the network. This requires an overview and monitoring of what information they have access to, how it is used, and that they themselves have the right security measures in place.

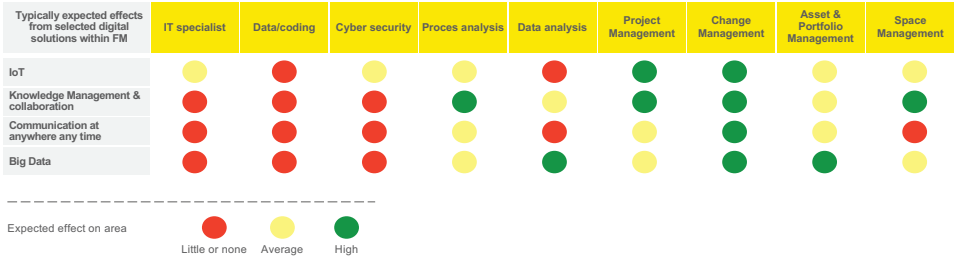
What effect will trends and new technologies have on skills and organization?

As stated in chapter 4, the assessment was that it is primarily IOT, Knowledge Management, Big Data, and communication anywhere any time that contains the potential to have the greatest impact of the new digital technologies.

The interesting aspect is whether we should expect this potential to have an impact on how facility management units organize themselves, and not least whether this entails a need for new competencies and capabilities. In order to generate the desired best business outcomes achieved with the implementation of the new digital technologies, facility management organizations would need to employ other types of employees and change the typical facility management organization into a consolidated portfolio of services and a centralized delivery device

Figure 4 shows an assessment of which professional competencies can be expected to be needed in connection with four selected technologies, as well as an assessment of the extent to which they will be relevant to a facility management department.

Figure 5 - Possible effect of technologies on the need for professional competencies



Source: EY

Our assessment is that for the IT specialist domain there will be a low need for own competencies. The reason for this is that the competencies, all things being equal, will be present within the company already, and it will not be rational to build up their own competencies. In addition, the needs will increasingly be covered by suppliers who will not only offer products, but solutions that can be implemented directly. However, it is

to be expected that the ongoing general IT competency building that occurs among the employees will generally be evident and able to enter into valuable collaborations.

Another area of competence is analysis capabilities. Here we see a clear need for process and data analysts who can analyze, map and understand processes internally within the organizations. It is to be expected that, based on very large amounts of data points from different IOTs, a need will arise to be able to consolidate, analyze and make decisions based on the data generated. Whether this capacity is going to lie internally or with solutions providers is still unclear. As it stands today, there are few suppliers that provide complete systems with the collection of consolidated data and algorithms able to analyze and optimize. However, it is to be expected that the market for delivering added value will go towards not only delivering a device but total solutions or stand-alone solutions that can be integrated with existing systems. For example, today the product Microsoft 365 has a built-in analysis tool, “Workplace Analytics” that can be activated directly and used as a solution to analyze and optimize the way workspace is applied.

A competency area that we expect will be in more demand is project and change management. All technologies will require a great need for management, planning, implementation and follow-up - traditional project management. But more importantly, it will require change management skills. User involvement, communication, education, management buy-in, stakeholder management and continuous retention will be consistently required competencies for all four technologies. It will be a completely different task to understand and operate on all levels of the organisation and not just in the background, which many facility management departments have done so far.

It is thus to be expected that there will be a need for new or additional skills and likely competences that will not typically be found in a facility management department. An assessment of make or buy and critical mass will have to be made, where some are likely to align with suppliers and advisors instead of hiring permanent staff. More mature facility management organizations will obviously bear the responsibility across the entire property portfolio, which is why they are expected to supplement with competencies in strategic portfolio management as well as space management. Real estate (RE) and facility management (FM) will increasingly give greater overall value to the organizations.

In terms of where the new technologies will influence the organizations' desired results, the assessment is that it will primarily affect the newer effects such as: productivity, total cost of ownership, sourcing / collaboration models and, as before, general cost reductions. In order to deliver these results, facility management organizations are expected to include the same specialists as in the rest of the organizations: controllers, HR partners, HQSE resources (Health, Quality, Security, Environment).

We believe that the primary drivers in terms of how to be organized will continue to be the decision as to whether to have in-house / outsourced, single service / bundled / IFM and scope in the form of services and geography. There is also no evidence that value is created by decentralizing facility management. One should therefore, with the new technologies and trends, ask the question of whether to dispose of some more operational competencies in order to focus the forces elsewhere - or whether synergies can be achieved with the existing organization. Will your own old operating organization be a disabler when you try to focus differently? Can facility management units work with the "old" operational resources, or will it be necessary to focus resources and management power on more tactical / strategic value-creating initiatives, including portfolio management, asset management, and space management?

Another perspective is whether the current organization is a barrier to new initiatives. Who, for example, is responsible for initiating and running an ABW project? Is it IT because there is a lot of technology involved, it is HR because it concerns employees and how we work together, or is it facility management because FM is responsible for work space? This is not clear in most companies; the challenges only become clear when projects become cross-organizational.

Our assessment is that the organizations ready to embrace change in the future will organize more according to processes than in terms of traditional departments responsible for sub-tasks in a process. We see this trend, for example, with the establishment of GBS units - Global Business Services - where many of an organization's support functions will be united in the same organizational unit, but organised with an eye to the overall processes in the organization.

The next generation of shared services and outsourcing

More than two decades ago companies began using shared service centres and outsourcing to improve the effectiveness of their support functions. It was typically finance that paved the way, followed by IT. The intention was to move routine and transactional tasks to specialists dedicated to handling the tasks at lower costs. This freed up resources and time in the rest of the business to focus and service the company's external customers. Shared services are internal solutions, while outsourcing providers offer the external choice.

Over the last 20 years, both shared service centers and outsourcing solutions have become more sophisticated. Companies have used offshoring of tasks to e.g. India and the Philippines and benefited from new technologies such as software robots for automation of processes and digital self-service solutions for chat robots.

The results have been impressive, and companies have been able to generate higher quality at lower cost in their support functions. Many companies are now ready for the next generation of shared services and outsourcing, and have begun to implement a multifunctional approach to their support solutions. Typically, this is handled by developing a single, unified organization that is able to control the company's processes end-to-end across functions - many large companies call the organization Global Business Service.

The model of and approach to a Global Business Service organization varies significantly - it varies according to the degree of integration between functions, whether there are few or several delivery centers, whether outsourcing or shared services (or a hybrid of the two) are used. Governance, and the ways in which roles and responsibilities are distributed are also significant factors. However, the model and the approach to GBS tend to share the same primary driving force. Cost savings are thus still a key goal, but today this is also supplemented by benefits such as scaling, standardization, process efficiency, and new attractive career paths for the organization's employees.

Journey towards Global Business Services

The journey towards global, multifunctional service centres is often an evolution rather than a revolution for most businesses. This does not mean that companies cannot

move quickly, if there is a desire and an ambition to do so, or that the exact same procedures must be followed every time. Rather, it is a realization that virtually all businesses can be categorized within one of four maturity levels.

Level 1: The normal approach

In this model, the companies have separate units that provide shared services for individual functions, such as purchasing or finance. The separate units have relatively limited contact with each other, and the managers typically report each to their respective managers, e.g. the purchasing director or the finance director.

But even in these separate units, there are often additional divisions between teams that serve different sub-functions, and this is especially true if services are provided across multiple locations. It is considered difficult at this level to handle processes that are cross-functional by nature, because of the structural division between the units.

Level 2: Towards a multifunctional approach

In this model, companies have begun to integrate their shared service units, but exclusively on a regional basis. The units combine two or more functions in several locations around the world. The heads of these units each refer to a Head of Shared Services who is responsible for performance monitoring and service management across regions.

The regional units are more able to drive integration between functional areas by drawing synergies from infrastructure, technology and location. However, these regional units still tend to operate individually with integration into other regions, often focused on single identified weaknesses in the existing set-up.

Level 3: Globalization

In this model, two or more shared service features are unified across all regions at a global level under a single Global Business Services Manager. The Global Business Services unit offers a streamlined concept for internal customers and works with a supply network of global process owners. All functions operate under a single service management framework.

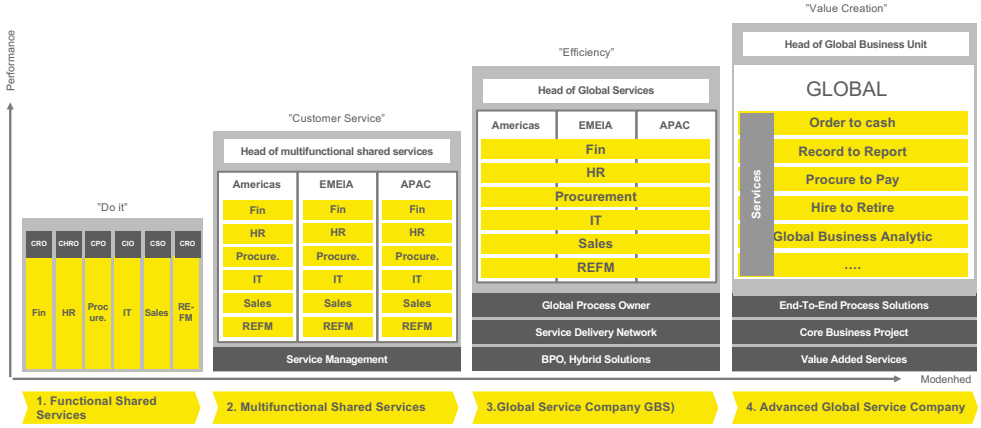
A Global Business Services unit will typically be set up with regional centres to adjust to the differences in time zones and languages of internal customers.

Level 4: Advanced multifunctionality

This model represents - compared to what we see at the moment - the destination of evolution towards Global Business Services. At present, only a small handful of the largest Danish companies have successfully reached this stage of integrating their shared services.

This level shares many of the same characteristics as Level 3, having a single shared service organization operating from regional and global service centres. On the other hand, the unit is no longer organized around the features being serviced, but instead focuses on end products. This model enables full integration of end-to-end processes across the entire organization. At this level, the unit is managed by a single Head of Global Business Services reporting directly to the Executive Board.

Figure 6 - Development of maturity in the Global Business Service organization



Source: EY

The Value of Global Business Services

Our experience shows that four basic factors provide the foundation of success in today's competitive global economy - and the trend towards a multifunctional approach and Global Business Services supports each of these factors:

- The customer focus - organizations have detailed knowledge of their customers and their geographical markets and use this knowledge to be innovative and create growth. Global business services are a key factor in this momentum via for instance data analytics or indirectly by releasing resources that focus on the strategic agenda.
- Operational flexibility - organizations respond quickly and intelligently to changes and new market trends. Global business services are a key factor in delivering this flexibility and scalability
- Cost Effectiveness - the organizations understand what drives cost and value and how they are optimized. Global Business Services organization employees are now focusing on both cost and value optimisation.
- Confidence from stakeholders - organizations engage a growing number of stakeholders and create the trust that is essential internally and externally. The integration of for instance the HR or REFM organization into Global Business Services can help accelerate this development.

There are thus many good strategic reasons for moving towards the next generation of shared services and outsourcing. It's a long journey and requires solid investment, but the benefits typically exceed those, so it's time to take the next step.

KIRSTEN RAMSKOV GALAMBA, DTU Campus Service. Kirsten has worked with sustainability and social change since the end of the 1990s, gaining experience from public as well as private companies. She is particularly concerned with what one can do from a facilities management position to contribute to a sustainable social adjustment, while at the same time raising job satisfaction and equipping the organization to work more on long-term strategic goals. Kirsten is currently responsible for group strategic initiatives in working environment, preparedness and sustainability at DTU's campus areas.

Digitization as a lever for sustainable FM

Within the last decade, an increasing number of companies and public institutions have joined forces in the momentum to create a sustainable transformation of society. This is due, among other things, to the fact that high credibility in terms of sustainability is by many considered a prerequisite for being competitive regarding the favours of consumers (companies) or attracting companies and taxpayers to municipalities and regions. Another reason might be that enthusiasts among employees and management have the personal attitude that it is important to care for our globe and hence want to make an extra effort. In addition, it is a well-known fact that an explicit focus on reducing resource consumption is good business - regardless of the branding value.

International agreements such as the UN's 17 Sustainable Development Goals (Figure 1) and, among other things, the EU's Circular Economy package[1] are the framework for this decade's sustainability strategies, and the FM organizations have good opportunities to contribute positively to the development of the organizations' sustainability accounts.

1 For more information, see the European Commission's website "Conversion to Circular Economy" (https://ec.europa.eu/commission)

Figure 1: Overview of the UN's 17 Global Goals. The Global Goals are often referred to as SDG - Sustainable Development Goals and are increasingly being used by many organizations as a benchmark in the sustainability domain.

(Source: sustainabledevelopment.un.org).

The UN Global Goals are the result of many years of international efforts to put sustainability on the agenda. Most refer to the Rome Club's Limits to Growth (1972) as the first significant bid for the need for (more) sustainable development. The UN Report Our Common Future, became the direct basis for the subsequent global agreement, Agenda 21. In 1987 the Brundtland Commission, on the basis of this UN report, presented an agenda for the 21st century, signed by world leaders at the UNCED UN Conference in 1992. From 1992 to the ratification of the UN Global Goals in 2015 the most important milestones have been the many COP meetings, where targets have been set for the planet's climate (e.g. COP 15 in Copenhagen).

The Global Goals are an extension of the UN's Millennium Development Goals and are thus more actionable in their design than previous global agreements on sustainable development. The simple, graphic mediation makes the goals much more popular in terms of distribution than previous global agreements - supported by significant weather events across the globe. Meanwhile, there has been a shift in focus, so it

becomes clearer that we must all act - and not just to save third world countries. In Denmark, the government has drawn up an action plan for the UN's Global Goals[2], followed by a report on status in 2018[3]. Of course, the Government's evaluation of its own practice is challenged by the country's NGOs, which add the overall message that the current thinking is short-term and that we need long-term significant goals in the domains of the environment, climate, economy, and social sustainability.[4]

After this introduction, we shall move on to take a closer look at facilities management. As an Facilities Manager, there is potential to contribute directly to several of the Global Goals through initiatives for e.g.: a good and healthy indoor climate (no. 3), a sensible management of water resources (no. 6), conversion to renewable energy (no. 7), development and maintenance of infrastructure (no. 9), contribution to the development of sustainable cities (no. 11), sustainable consumption and production (no. 12), CO^2 reduction and climate adaptation (no. 13), limiting hazardous emission substances in the environment (nos. 14 and 15). World Goal 17 points out that these ambitious Global Goals can only be achieved if we (also) cooperate across local and national divisions in strategic development partnerships.

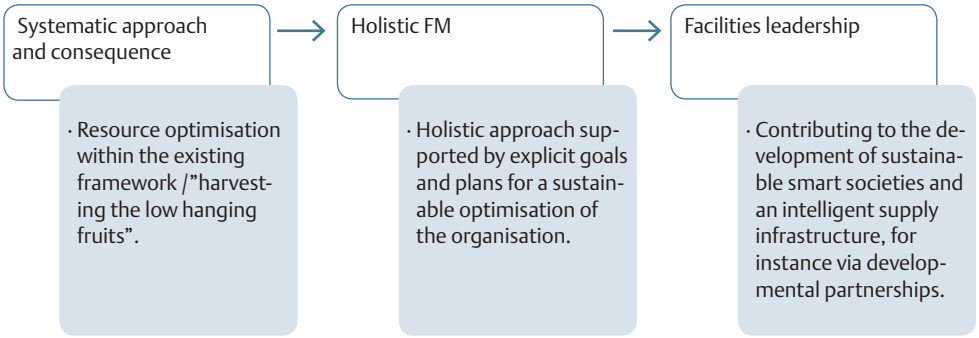
There is often a connection between the organization's maturity and the way in which sustainability is implemented, as organizations with great strategic capacity are better able to embrace societal leadership. Conversely, a decision to make a difference in the sustainability domain can also be used as a lever to bring the FM organization to a more strategic level. This is because dedicated efforts for sustainability require systematics, overview and planning, as well as an orientation towards the surrounding society in the context of the task solution - all keywords for the skilled FM organization that takes leadership seriously. It is important to note here at the outset in this chapter that all FM organizations can and must make an effort for sustainability, no matter how "mature" the organization is in this field (Figure 2).

2 Action Plan for the UN Global Goals - Denmark's follow-up to the UN's Global Goals for sustainable development. The Danish government, March 2017.

3 Progress report on the Action Plan for Implementing the Global Goals. The Danish Ministry of Finance, June 2018.

4 Shadow report on Denmark's implementation of the Global Goals. The 92-Group – the Sustainable Development Forum, June 2018

Figure 2: All FM organizations can and must contribute to sustainability, whether they are newcomers or take part in societal leadership.



The concept of sustainability can thus contribute to the discussion in very effective ways in the effort to bring the facility manager into a strategic dialogue with the organisation's top management, as the FM unit can offer concrete results in relation to a broader sustainability agenda. However, it is important to be aware that there is no "real" solution. Each public or private organization must, for example, on the basis of the UN's Global Goals, make decisions as to where it can best assume responsibility for contributing to sustainable social development.

In order to establish a baseline of the effort, a few suggestions are outlined here as to the nature of an unsustainable society. This is not meant to be a moralizing speech, but an explanation as to why it is important to work with sustainability - and why it will be a fundamental future prerequisite for driving and developing society and business.

The diagnosis is not so good, because the current societal consumption of resources by far exceeds the planet's ability to "deliver". This raises the need for the conversion of energy consumption into renewable energy sources, increased recycling of non-renewable materials, as well as a balanced consumption of renewable resources, so that they can be used within the limits that the planet's ecosystems can produce long term. At the same time, there is a major challenge associated with the use of environmentally-hazardous (toxic) substances in connection with agriculture and the production of goods that can lead to air and drinking water pollution, accumulation of toxic sub-

stances in nature - and ultimately affect animals, and human health and fertility. At the same time, there is an increased social inequality in many places on the planet, human rights are challenged, and not everyone has access to education. The number of people living in extreme poverty has halved since 1990, and there has also been a positive development in terms of eradicating hunger and malnutrition (goals 1 and 2). But even in these domains, there is still a long way to go before the goals are reached.

However, the extensive digitization of society has opened up new forms of sustainability measures such as sharing economy as a strategy for resource efficiency, data platforms as the focal point for trading in and recycling of resources and digital marking as a tracking tool. The idea of open data and free access to digital documentation and exchange platforms potentially contributes to the democratization of knowledge and the strengthening of fact-based learning and thus to the creation of increased insight and equality globally. On a slightly smaller scale, digitization of data can create a more nuanced basis for decision-making and getting a better overview, while also contributing to optimizing workflows from a holistic and sustainable perspective.

If orchestrated openly and with a view to a more comprehensive societal capacity building, all of the above can contribute to formulating and realizing ambitious strategies for sustainability. An ambitious strategy for sustainability can in principle contain objectives within all Global Goals, with particular focus on the goals outlined initially. In addition, the strategy may include objectives on how and with whom the organization wishes to enter into partnership (Objective 17).

Since this White Paper deals with the importance of digitization within FM, the following will focus on three main areas, all of which are undergoing change as a result of digitization.

- Resource efficiency and circular economy.
- Intelligent energy supply and consumption.
- Smart cities and intelligent / cognitive buildings.

5 For more information, see the annual National Human Development Report published by the UN.

The justification for focusing on these three themes in this chapter is that they are frequently discussed in Danish and international dialogues regarding sustainable social change in a digitized society. The omission of reflections on, among other things, health promotion and working life in this chapter is not an indication that we are less concerned about these issues!

By way of conclusion, a critical perspective will be given on digitization in a sustainability perspective. Moreover, I shall comment on aspects of the organization's work that can become operative in terms of building up organizational capacity to address sustainability concepts beyond CO^2 reductions and signature projects.

Resource efficiency and circular economy

Resource efficiency has long been on the agenda, highlighting among other things a response to rising production prices and demands from consumers and organizations to care for the environment and resources as part of a global sustainability strategy. As purchasing / consumption of materials and waste management are in on the agendas of all FM organizations, this section focuses on what digitization can mean to the FM person's efforts to increase resource efficiency and contribute to circular economy.

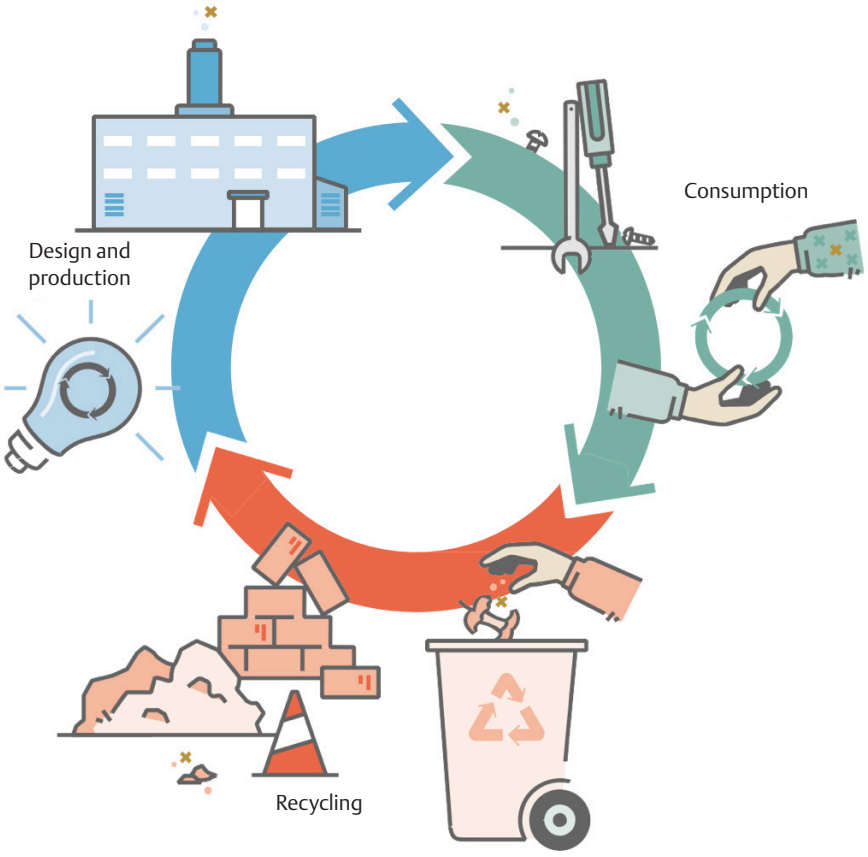
Within the last decade, concepts such as Cradle2Cradle (C2C) and Circular Economy (CE) have gained ground in many people's vocabularies as principles to safeguard the planet's resources for future generations.

Circular economy and Cradle2Cradle are two concepts that speak on the same logical premise: that materials must be manufactured, used and disposed of in a way that maintains the materials in a closed circuit (Figure 3). The concept of circular economy is based on the vision of breaking with the linear "use and discard culture" and thereby future-proofing the opportunities of production and consumption in a society with increasing prosperity.

The principle of circular economy is not new. It is mainly based on common sense. Previous generations were good at reusing old items to manufacture new ones, and what could not be recycled directly was transformed into materials that could be reused for

other purposes. The reasons were in many cases a concrete lack of raw materials and supplies.

Figure 3: Principle outline of the elements of the circular economy in an FM perspective.



Source: Advisory Board for Circular Economy - Recommendations to the Government. June 2017. Ministry of the Environment and Food of Denmark.

The new technologies have now made it possible to extract virgin resources with much greater efficiency and to transport and trade raw materials across the globe. At the same time, the amounts of waste have increased exponentially resulting in consequences for the entire globe. What was a good strategy for decades, with increasing

population, increased consumption and resulting increased amounts of waste, has become a visible and overwhelming problem. There is a need to learn from the ancient virtues and modes of production.

However, this is not an uncomplicated venture in a product range, made up of composite materials, assembled in blended products and building components, which make the individual parts inseparable upon disposal.

Digitization can potentially support mapping of the materials' pathway from raw material to recyclable and replaceable elements in well-designed products. It will raise awareness of resource optimization as well as circular recycling and economic flow in several ways, which have (or will) directly or indirectly affect the FM's everyday life, work life and roles in the production chain.

Particularly in the contexts of construction and the handover of buildings to the users, there has been a focus on digitization as a way of ensuring a basis for future maintenance and operation. In connection with the description of requirements specifications for a building, it may therefore be beneficial to set requirements for knowledge of the possibility of a potential later selective replacement of building components with a short life, as well as knowledge of the proportion of the materials that are recycled and / or reusable.

In addition, this will help to develop the industry in a sustainable direction if, in connection with the purchase of construction products, there are always requirements for 'sustainability documentation' such as content and potential evaporation of chemical substances, recyclability, acoustic qualities (surface material), production conditions (child labour / working environment in production unit), transport (distance / means of transport) etc. Digitization makes it easier to search information throughout the world, and as more producers become better at declaring construction products, it will also be easier to choose the right products.

For those who choose to build and do maintenance with recycled materials, there are a wide range of digital platforms for disseminating offers to sell and buy recycled building materials, organized and local, national and international waste and resource

exchanges. This enables construction work, based on recycled materials, and enhances the opportunity to sell usable materials from buildings undergoing demolition. At the same time, digital labelling and tracking of materials can be carried out, which again supports supplier chain management, durability declarations, and thus contributes to creating greater credibility for products in an otherwise relatively non-transparent global market.

The above is a reflection on the opportunities that digitalisation opens up in the contexts of designing and constructing buildings and facilities that contribute to a more circular and sustainable society. It is, however, essential that the individual FM organization makes clear what capacities each building should have in a slightly larger perspective, so that consideration for the environment will be balanced with other requirements such as functionality, a healthy and safe working environment for the users, as well as flexibility and future protection. There are several recognized standards for sustainable construction that the FM professional can benefit from - directly or as inspiration - to help balance the many considerations to be taken (DGNB / BREEAM / ...).

In relation to operations and services, digitization has meant that much more detailed workflow and resource flow analyses are carried out today, which can support decisions in relation to possible adjustments in workflows. In practice, this can contribute to a more enjoyable working life for the service provider, while at the same time controlling purchasing, use, recycling and sorting for recycling.

Intelligent energy supply and consumption

It is difficult to imagine an FM sustainability plan, where no energy consumption and / or CO^2 emission targets are set. In the following, I shall give a very brief presentation of the strategic framework for development of intelligent and sustainable energy supply and consumption in order to be able to make recommendations concerning possible FM strategies and initiatives.

There are ambitious targets for reducing CO^2 emissions in the EU[6] and Denmark[7]. Achieving the goals requires, among other things, a switch to the production of electricity, based on fossil-free energy sources such as solar, wind, and hydropower, as well as optimizing the energy consumption. One challenge is that energy production varies with wind and weather, which makes it difficult to guarantee supply security, especially in peak situations.

Good cooperation is already established in the Nordic countries in relation to the exchange of energy across national borders. This is one of several prerequisites for being able to switch to fossil-free, as energy production, based on different sources, can complement each other and thus in the long term contribute to high supply security and thus a greater social resilience (robustness).

However, work is also being done to find solutions within the field of energy storage, so that the energy supply becomes less dependent on present-day production. In this connection, the vision is that electric cars and other electrical appliances with charging capacity can function as a buffer in the electricity grid, by drawing power from the units to the grid in peak loads. There are also forces that work for a specific type of houses to be made into energy-producing units that contribute energy directly to the electricity grid.[8]

All of these visions are based on the fact that digitization enables a 1: 1 present-day management of energy production and consumption. Admittedly, there is still some way to go, partly because there are a large number of regulatory and technical barriers that must be overcome.

However, FM organizations can play a significant role in the transition by putting pressure on users to develop sustainable behaviour and on decision makers to clear away barriers, participate in pilot projects, make buildings available for research and

6 https://europa.eu/european-union/topics/energy_da

7 For more information, see the website of the Danish Ministry of Energy, Utilities and Climate.

8 Smart Energy - barriers and solutions catalogue, Rambøll

development, and manage distribution and control of energy in own buildings (CTS / smart grid / ...). In practice, it requires the targeted management of energy control, the establishment of clear success criteria in terms of goals and justified priorities, the programming and calibration of the CTS, and the capacity to analyse data.

Analysis of data must constitute the basis for learning and planning of the organization's forward-looking efforts. In this context it is important that the organizational and financial frameworks are clear to everyone who contributes.

It is the recommendation of this chapter that, at a strategic level, the organisation sets ambitious targets for partly switching to fossil-free energy sources (e.g. 70% fossil-free energy in 20xx) and partly by reducing energy consumption (e.g. reducing 60% according to reference year / 4% per year) - and that progress is measured via annual green accounts. Establishing ambitious, management-approved targets seems very motivating to the effort, especially when at the end of each year the result must be presented in the green accounts.

It is moreover recommended that the work on energy savings be systematised on the basis of an energy management principle, where there is always a focus on learning. The combination of ambitious goals, concrete action plans and follow-up through detailed green accounting are good prerequisites for learning and change.

The individual FM department can (and should) take care of and integrate the above issues into a baseline that must ensure a credible brand for the individual organization. However, there is a need for development at a larger, international scale in order to establish a framework for meta-governance (overall management) and cross-sectoral management of the necessary change and innovation processes. This initiative is processed via a large number of international collaborative projects, supported by, among other sources, EU funds, which aim to support conversion to fossil-free energy supply. FM organizations are often invited to join this type of collaboration as a "case", since development should always have a concrete starting point. And here FM can contribute directly with data as well as with knowledge and experience.

Smart cities and intelligent / cognitive buildings

On a slightly larger scale FMs also contribute to the development of smart cities. Many larger cities develop strategies for smart and sustainable communities. At building and infrastructure levels we focus on intelligent or cognitive buildings and facilities with a high degree of automation and the possibility of optimizing resource consumption. All this is within the FM's field of responsibility and is important to the daily dialogues with users, citizens, decision-makers and suppliers.

This section briefly presents aspects of the influence of digitalisation on the development and operation of cities and buildings. The section reflects that the trend towards "smart cities" is at a very early stage. The vision of cities, supported by digital control, offers space for high quality of life, while using resources over and over. This is precisely that - a vision. But while the vision comes to life in small domains around the world's cities, work is done to build the digital infrastructure that will enable the transition. Hopefully, this article will stimulate curiosity in terms of knowing more about "smart" - and wanting to develop a corner of the smart city yourself from an FM perspective.

In Denmark the Smart City concept is mainly developed along the lines of an environmental and climate-oriented direction. There is a focus on the potential for linking urban resource flow, thereby increasing resource recycling and increasing the efficiency of the way resources are spent. However, the most advanced development in the Danish use of technology is, for example, to minimize search time in connection with parking, nudge for proper waste sorting via intelligent waste containers, and support the transition between more flexible means of transport, such as share cars/ bicycles and the ways these can be combined in complementary modes with e.g. self-propelled buses.

This is based on the idea of the "Internet of Things" - a concept inscribed in the vision that the city's elements, all equipped with digital sensors, are linked via the Internet in order to allow real-time management of the city's flow of vital resources. (energy / materials /...), while the city's users are constantly informed about current cultural offerings, air quality, transport options, etc. In practice, one can say that the city is constantly "surveying" what is happening and returning information to the users in order to ensure the best possible experience.

In connection with the development and operation of the building portfolio and the associated green areas, public property centres / FM departments have a special responsibility for conceptualising public properties in a larger, urban context in an exemplary manner. This is a task involving a high degree of complexity, as each building, space and green areas can / must provide the community with as high a degree of value as possible. Some municipalities are working on the idea of digital platforms as a kind of management of indoor and outdoor spaces belonging to public buildings outside the normal use time. A concentration of activities in the same building will contribute to more resource-efficient utilization of the areas (in terms of light / heat / ventilation), while there will also be a basis for social meetings among the local community's associations and joint activities.

The vision of the smart city is parallel to the concept of intelligent / cognitive buildings. The FM industry has long worked on digitization of the building construction, digital resource management and digital support for space management. The industry has thus gained valuable experience regarding the importance of working with compatible systems, quality assurance of data, and a wide range of other important focus areas. Translating the FM industry's experience with smart buildings into cities and regions, it is obvious that there is a great future challenge associated with ensuring standards that allow data flow and resource management across the board.

The challenge involved is to ensure a synergy of cross-border strategies between organizations, cities, regions and countries. The responsibility for such a venture lies primarily with public authorities at all levels. One point of departure could be that each authority prepares clear strategies and plans as to how we best ensure a sustainable (circular) resource flow, as well as proactive ways in which the digitalisation can facilitate this development.

FM departments can contribute by working purposefully to develop an evaluation and learning culture, focusing on translating data from the monitoring of buildings, consumption, user behaviour, etc. to knowledge. This knowledge can be the basis for the design of the future buildings and, perhaps more importantly, for planning new workflows and routines in the work of operating and maintaining the existing building stock.

In this section I recommend that experiences from the development of own buildings and workflows are integrated in cross-geographical and cross-professional dialogues in order to help create tomorrow's sustainable, smart cities and / or local communities. This initiative should occur partly in the context of the development of common digital standards, partly in order to ensure a link between digital control and flow of physical resources.

Perspectives

Working with sustainability is about taking a stand. FMs should actively consider how to organize tomorrow's society - and then take action. We must make decisions and set norms and standards regarding the extent to which we will accept environmental risks, and what quality of nature and life we want - both locally and globally.

There are many ideas as to how the future digital society will look - from beautiful, green, and digitally supported sustainable communities to a dystopian future, where people are monitored and disempowered by digital implants and total automation on an increasingly polluted planet.

The choices that are currently made in the design, building, furnishing, operation and maintenance of buildings and outdoor spaces are of importance to tomorrow's society and to future generations. These decisions will have an impact on the well-being of human beings. We will be affected by being exposed to windows that open and close in seemingly random ways, light that goes off when sitting a little too quiet, and blinds that roll down just as you sit and enjoy the view with a cup of coffee. There is a balance between self-management and external management - between local sustainability and the global climate.

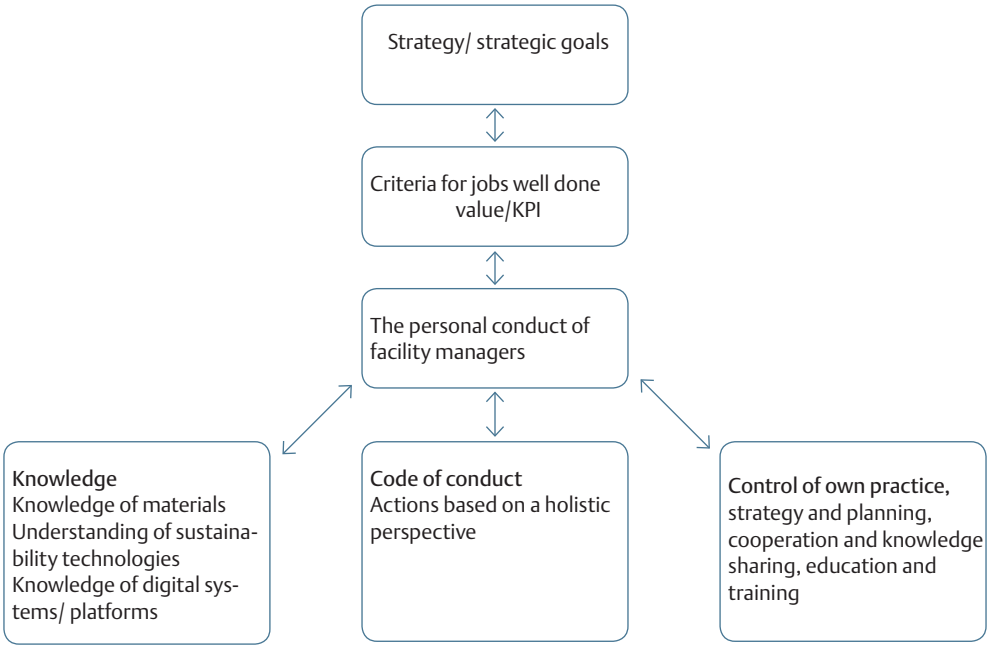
There is a need for an increased awareness of environmental and climate potentials in the digitization of products, buildings, workflows and society. The potential energy savings that can be achieved by introducing new technologies are overtaken by increasing energy consumption, because there are so many more electrical appliances in use (the rebound effect). At the same time, the amount of poorly designed electronic waste that is unsuitable for recycling is on the rise, as electronics are increasingly integrated into more products (Internet of Things).

The FM professional can make a huge difference here by paying attention to the criteria for the acquisition and disposal of the digital devices. Once the product is phased out, recycled or forwarded as raw material for new products and functionalities, the digital devices must be detachable from the product of which they are an integrated valuable part.

Regardless of how the local, social and global strategies point to the creation of a sustainable future, there is a need for conscious FM strategies, concrete sustainability goals, good planning, action, follow-up and space for professionally founded learning as well as the development of conscious and competent behaviour.

It requires organizational and managerial capacity to implement cogent best practices appropriately at the right time and place. The figure below presents a bid for essential assumptions that must be present in the FM organization in order to be able to work strategically and long-term and thus contribute equally to fulfilling the organisation's overall strategy (Figure 4).

Figure 4:



An overall organizational capacity must be built up so that the individual FMs can do the right thing at the right time and place in terms of contributing to the development and implementation of the company's sustainability strategy. Organizational capacity consists in principle of a large number of factors as outlined in the figure (Source: PhD dissertation v. Kirsten Ramskov Galamba. The dissertation can be seen on dfm-net.dk).

The top management is, of course, responsible for selecting / approving strategic goals and ensuring that management and employees in the organization know the criteria for well-executed work. However, the individual Facilities Manager has the opportunity to embrace leadership by proactively bidding on these goals or entering into a qualifying dialogue with the top management, so that the goals are selected on an informed basis.

There can be a difference in the balance between explicit, measurable goals and implicit, culture-based goals from organization to organization. In the context of the resource agenda, it can be a strength to set measurable goals. However, it is important to keep in mind that there must be room for developing new, alternative solutions to the societal challenges, which are best framed by a more value-based management, where focus is on developing practice from an holistic perspective.

In addition to a clearly communicated strategy, which is reflected in the organisation's code of conduct, it is a prerequisite that the right knowledge is present and that employees and management have the opportunity to prioritize time for strategic development, collaboration across the board, as well as the daily, practical tasks. This is a challenge, especially in operation organizations, where everyday life is often defined by urgent tasks.

However, time for reflection on one's own practice in a well-informed holistic perspective is the most important prerequisite for the FM organization to be able to commit itself to becoming a proactive player in the organisation's strategic efforts for sustainability. I call it Facilities Leadership for a sustainable society.

9 See article in FM Update # December 20, 2013 pp. 22-23

What responsibility should future Facility Managers assume, when digitization challenges the company they work for? Should you continue to focus solely on optimizing operations or are there other ways to create added value for the company and thereby ensuring the company's survival and progress? How can you simultaneously be visionary and business driven? Moreover, should the Facility Manager continue to be a support function or aim to be a more integrated part of the business?

In this book each of our six experts unfold their ideas on how corporations can focus more on people and less on traditional workplace structures, while making the most of the digitization of FM:

- How to handle digitization in a structured and value-creating way
- A description of the technologies you can use to your advantage
- The basic considerations of FM management
- Suggestions for clarifications of the digitization process
- Real-time examples of how digitization can be addressed

"Core businesses change their business models and go digital. To some it looks more drastic than to others, but the core business aspects of almost all companies are influenced by digitization. This scenario changes the significance of having the right buildings in the right places".
Lau Melchiorsen, author of chapter 1

"It almost sounds like the title of a B movie when trend researchers describe a situation where 'the war of talent' is a fact of life. This scenario is unlikely and should be perceived as just one among many management terms used to articulate the wonderful workplace reality we are a part of ".
Gitte Andersen, author of chapter 2