BEST PRACTICE FOR A SUCCESSFUL CAFM IMPLEMENTATION
CAFM EXPERIENCES FROM GERMANY, AUSTRIA AND SWITZERLAND

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ABSTRACT
Since the 1990s Computer Aided Facility Management (CAFM) has provided efficient IT tools for the illustration, evaluation and control of Facility Management structures and processes. During these years numerous software systems with various systematic approaches, functions and varying degrees of success have been established on the market. Despite the multitude of suppliers and users in different branches of industrial sectors there is still insecurity concerning the procedures and achievable effects. This is closely related to the lack of well documented, transparent and successful case studies. This paper presents the first comparative analysis of the CAFM sectors in Germany, Austria and Switzerland. Due to the geographical location of the project partners the entire German speaking area could be covered and thus the results of the analysis reflect the state of the art of CAFM implementation and use in the German speaking area. This study of successful CAFM projects in companies and public institutions should make the know-how and practical experience available publicly. It presents current trends and technologies and provides recommendations for successful CAFM implementation.

KEYWORDS: Facility Management, CAFM Best Practice, Case Studies, Strategy

BACKGROUND
After salary and wages, expenditures for facility and real estate represent the largest part of the operating expenses for a company, and any improvement of cost effectiveness results in a significant overall saving of costs (Finlay, 1998). Over the past years, the adoption of information and communication technologies (ICT) has affected property management (Thompson, 2005). Since the 1990s Computer Aided Facility Management (CAFM) has been providing efficient IT tools for the mapping, evaluation and controlling of Facility Management structures and processes. Since then numerous software systems with various systematic approaches, functions and varying degrees of success have been established on the market. Despite the multitude of suppliers and users in the different branches of trade, there is still uncertainty concerning the procedures and achievable effects. This is closely related to the lack of well documented, transparent and successful case studies. In addition, little is known about how CAFM is implemented successfully and the factors leading to success. From an economic point of view, it is very important to support the process of implementation in order to avoid wrong decisions and unnecessary investments. Implementation strategies and formulae for success are especially of great interest.

INTRODUCTION
Information technology (IT) delivers tools and methods which allow control over the enormous complexity of FM processes. Without IT support the challenging goals of FM cannot be reached or can only be achieved insufficiently. IT not only functions as a unifying
Computer Aided Facility Management (CAFM) with additional help from the latest electronic data processing (EDP) and information technology represents the support and realization of the Facility Management Concept throughout the entire life cycle of a real estate property. CAFM represents the application of computer systems, including hard- and software, to support FM functions efficiently. CAFM software systems are tools which back up the specific processes of FM and the persons directly or indirectly involved in those processes. Thereby all relevant data for the life cycle of facilities are captured, used and analyzed electronically. In addition, the CAFM software has to provide a number of primary functions (GEFMA 2002) to fully meet the requirements of FM entirety. From time to time, FM has been equated with a CAFM software. This point of view ignores the extensive and integrating approach of FM. However, it is correct that nowadays FM without IT support and software systems cannot be carried out efficiently, even if it is still in the early stages of development. The great diversity as well as the complexity of the different FM processes and -tasks is responsible for that.

In many cases, during the introduction of FM, the hope of resolving all FM problems just by implementing a CAFM software is mistakenly assumed. If the necessary preliminary enquiries, planning as well as strategic decisions are missing and the involvement of the personnel and management concerned is lacking, then the implementation of FM is doomed to failure. In addition, the software becomes an expensive investment. FM is developing in various European countries. Certain historical and cultural circumstances, organizations and business areas have been the basis for different views and approaches. In general, all organizations, whether public or private, use buildings, assets and services (facility services) to support their primary activities. By coordinating these assets and services, by using management skills and by handling many changes in the organization's environment, Facility Management influences its ability to act proactively and to meet all its requirements. This is done also in order to optimize the costs and performance of assets and services. “FM is an integrated process to support and improve the effectiveness of the primary activities of an organization by the management and delivery of agreed support services for the appropriate environment that is needed to achieve its changing objectives” (prEN 15221-1, 2006).

The concept of FM was not new when the term “Facility Management” was introduced in the USA in 1979, as the management of large facilities or properties for a profit had already been practiced before. The definition used by the International Facility Management Association (IFMA) is: “Facility management is a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology” (IFMA, 2007a). Facility Management contains the concepts of cost-effectiveness, productivity improvement, efficiency and the employees’ workplace quality (IMFA, 2007b).

**PURPOSE OF THE SURVEY**

For the first time, the paper introduces a comparative survey of the CAFM field in Germany, Austria and Switzerland [see May, et. al. 2007]. The survey of successful CAFM projects in companies and public institutions is supposed to bring know-how and practical experiences to
public attention. Current trends and technologies as well as advice and practical instructions will be presented to facilitate a successful implementation of CAFM. The article is directed at users, software manufacturers, partners of implementation, advisors, service providers, students and lecturers as well as decision-makers in Computer Aided Facility Management.

RESEARCH METHODOLOGY

The project was implemented by the University of Applied Sciences, Berlin and the University of Applied Sciences, Kufstein in cooperation with IC Information Company and Reality Consult GmbH. It was supported by the Competence Centre Facility Management of the University of Applied Sciences, Berlin and the Tyrolean Science Funds. The German-speaking region could almost completely be covered in the survey, because of the geographical locations of the project partners. Therefore, the results of the survey reflect the current level of research of CAFM implementation as well as CAFM utilization in the German-speaking area.

The survey was conducted by detailed interviews following exactly the same structure:

- General data related to the organisation (private or public), i.e. description of core business
- Data related to real estate / property
- FM objectives and policy
- Initial situation
- The CAFM project
- Lessons learned and evaluation.

This structure is consequently used in describing the various case studies.

STRATEGIES FOR THE INTRODUCTION OF CAFM

The successful introduction of a CAFM system comprises more than the procurement of software. It entails an extremely complex process which normally concerns the whole organization of a company or a public institution [May 2006]. It is about a process, beginning with a concept and ending with the implementation, which has to be organized and run as a complex project. Naturally, the choice of a strategy for the introduction of FM depends on several factors like the existing budget, the available time frame, the extensiveness of the project and finally the existing know how of the company and the project planner. If and when external know-how has to be consulted depends on the factors described above. Since, in most cases, the introductive companies have only very limited practical experience with the implementation of a CAFM system, it should be attempted to integrate the know-how through an external partner.

The integration of a CAFM software into the company’s IT structure is of great importance. While doing that, data transmission and data handling has to be taken into consideration. In particular data collection and data maintenance require a lot of effort and resources. Besides this fact, the strategy for the introduction of CAFM is confronted with the same tasks as other operational information systems. That means that on the one hand the concerns of the informational infrastructure have to be considered, and on the other hand the illustration of the facility processes has to be done as smoothly as possible. Therefore, the strategy of the
implementation of CAFM systems should tend to take into consideration prevailing structural and technical conditions which are the company’s informational function and of the FM department’s functional needs.

**FACTOR OF SUCCESS: DATA COLLECTION AND DATA MAINTENANCE**

Since the data collection generally appears as the biggest cost block, representing more than 50% of costs during the implementation and the operating phase, this area has to be treated with sensitivity. Further big cost blocks can be summarized as procurement costs of the system (software, hardware) as well as the costs of project work (advice, training, customizing). Data collection and data maintenance usually cause higher costs than the needed soft- and hardware as well as the training of the employees (Nävy 2006, May 2006).

The commencement and/or the production of drawings as well as the recording of the alphanumeric data under consideration of the data base belong to the phase of data collection. The filling of the CAFM system with data is a time-consuming and labour-intensive process. Whereby, not only the data entry, but also finding and providing the data, represent a lot of expenditure. The necessary expenditure depends on the intensity of handling (e.g. while searching for data), the examination of quality and topicality, the update, the revised collection, the input of data and the conversion from other systems as well as the handing over to the CAFM system.

The collection’s expenditure of the continuation of data essentially depends on the detail of the desired data. During the first collection, the facts shows that especially the depth of information can be chosen in order that on the one hand the request of use can be fulfilled, and on the other hand regular data care can be guaranteed. Striving for an overly high accuracy in data care is uneconomical, as it results in excessively high labour-intensive expenditure. The negative impact would be that data are neglected, costs rise and consequently a system exists which supports Facility Management insufficiently.

**FACTOR OF SUCCESS: STEP BY STEP INTRODUCTION/ PROJECT MANAGEMENT**

As not only different groups of persons, but also processes of a company are affected by the introduction of CAFM systems, the introduction involves a highly complex and extensive undertaking. As a consequence, a successful introduction requires good project management and managerial commitment as well as the integration of all areas of a company. Basically, it can be said that during the CAFM introduction concept the following questions should be answered:

- Which processes should be supported?
- Which building-related information is necessary?
- What is the necessary level of detail for the required information?
- What kind of reports and evaluations have to be produced?
- Which department is interested in the use of a CAFM system?
- What kind of informational infrastructure prevails in the company?
Especially the last question has great influence on the relation between costs and usage as well as on the resources for data collection and data care. Experience has shown that a step-by-step introduction, which makes it possible to calculate in steps, has the advantage of achieving success and use with little effort in over a relatively short period of time. In addition, the quickly achieved success and use have an accelerating effect on further project phases.

**FACTOR OF SUCCESS: ECONOMIC EFFICIENCY**

The proof of the economic efficiency of a CAFM project is one of the key factors to success. If you cannot show that the investment in this technology will pay back, it is hard to gain support from the top management. The economic benefits of using CAFM systems is a hot topic. This is mainly due to the fact that quantitative effects (figures) related to CAFM cannot always be presented and proven very easily. Many of the advantages visible are rather of a qualitative nature. Usually, the cost originating from a certain FM process is not known in detail. This makes it difficult or even impossible to compare the situation with and without CAFM support.

However, to get a reliable view on the financial benefit of CAFM we need to know the (internal and external) cost and benefits quantitatively. Unfortunately, there are hardly ready-to-use models for deriving the return on investment (see May et. al 2007). Consequently, GEFMA’s working group on CAFM developed an ROI model for CAFM use in a company (see Hohmann et al. 2001, May 2002). The approach taken can be applied to other software systems as well. Initial point of the model are the so-called ROI drivers.

Hereby, we mean the impact of IT support on fundamental FM factors and processes. The following factors were identified to be the most important ones:

<table>
<thead>
<tr>
<th>1. maintenance</th>
<th>9. integration (IT, processes, organisation, ...)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. cleaning</td>
<td>10. service desk</td>
</tr>
<tr>
<td>3. space utilisation efficiency</td>
<td>11. security and key management</td>
</tr>
<tr>
<td>4. occupancy (empty space) management</td>
<td>12. contract management</td>
</tr>
<tr>
<td>5. Corporate Identity (CI) contribution for the company</td>
<td>13. procurement and outsourcing</td>
</tr>
<tr>
<td>6. standardisation</td>
<td>14. service charge settlement</td>
</tr>
<tr>
<td>7. transparency</td>
<td>15. sales support</td>
</tr>
<tr>
<td>8. relocation / move</td>
<td>16. energy and environmental management</td>
</tr>
</tbody>
</table>

Now the size of the achievable return on investment (ROI)

\[
\text{ROI} = \frac{\text{Output}}{\text{Input}} = \frac{(\text{Income} - \text{Cost})}{\text{Capital Invested}}
\]
can be depicted in a diagram over time (see Figure 1).

ROI drivers have an impact on income (A), cost (B) and assets (C) related to the real estate of a company. The size of the bubbles indicates the economic potential of the respective process/factor. Small bubbles mean low potential and big ones a high potential.

Usually, we require support from a CAFM system especially for those processes/factors having a comparable high ROI. The model can now assist the facility manager in estimating the economic efficiency of using a CAFM system for certain FM functions. Processes located in the upper right quadrant of the diagram are those with a high ROI achievable in a short time.

Further research intends to verify the model by investigating examples from different application fields. This will also discover possible deviations of the model for different areas (e.g. hospitals, office buildings).

In the current case study this model was applied and the ROI drivers investigated. It turned out that the most important drivers in the case studies were: transparency, maintenance, cleaning, space utilization and standardization.
RESISTANCE DURING INTRODUCTION

Most of the time, the introduction of a CAFM system causes extensive changes or adaptations of the company’s processes, and therefore, concerns a large number of employees. If the members of staff are informed insufficiently or if they are not integrated, resistance has to be expected. In principle, it should be taken into account that resistance against changes in processes is a natural reaction, because changes or reforms always cause fear and insecurity. With the help of an open and targeted informational policy as well as an active integration of the persons affected, the critical phases could be reconciled in a shorter period. It is to be recommended that by speedily achieving “Quick Wins” the persons affected can already gain individual advantages out of the system. Consequently, resistance is minimized and acceptance increases rapidly. In many introduction processes, the company’s management, however, refuses to collaborate with the affected employees with the argument that this would require too many resources and would be too costly).

ANALYSIS OF THE ECONOMIC EFFICIENCY OF CAFM

On the basis of case studies (see May et. al 2007) it can be clearly recognized that the CAFM of the analyzed companies was economical. Furthermore, apart from this clear and comprehensible efficiency of usage, further usage can be generated indirectly. That can occur through improvements of the data quality, by company wide availability of the relevant information or through the possibility that data can be analyzed individually. Thus, also during the strategic planning of Real Estate and Facility Management, indirect benefits will be achieved. For the last two years the discussion during consultations with organizations, which establish integration and processes supporting CAFM, has shifted from the question of how large the return on investment is, to the question of how quickly efficiency can be generated and what measurements have to be taken in order to improve the productivity of the affected organizational units. The general question of the economic efficiency of CAFM is not at the centre of attention anymore, but the speed of achieving the efficiency of usage comes to the fore. Now, during the realization of restructuring projects and organizational changes, the factor “time to market” also became an important indicator in the overall context in the area of secondary processes. During all these change projects IT support comes first.

In the near future there will have to be a special focus on the subject of system change. As a result of the ongoing consolidation of the CAFM provider market and on the increased focus of the systems on processes rather than on inventory data as well as on the integration of CAFM systems into the company’s ERP landscape, a lot of implemented stand-alone systems from the 90s will be replaced. Thereby, the reusability of data from the old systems will turn out as a critical factor of success. If the achieved benefit should not be ruined by the data’s incompatibility, the standardization of CAFM data materials under content and technical criteria must receive high attention while considering the introduction or the change of the systems. While examining the economic efficiency of CAFM systems from a FM service provider’s perspective, it becomes apparent that they mostly have similar demands on IT support in Facility Management compared to the self-interested consumer. However, the necessity of integration into the company-wide ERP system has much more significance. The trend of many service providers to simply use a CAFM system, which was chosen or already provided by the customer, does not dissolve their complex assignments which include, but are not limited to the evidence of achievement and calculation requirements. Solutions, which
integrate processes of the target group - customers, the service providers and the subcontractors - and display them regardless of their location on several levels, will capture a remarkable position for this target group in the future.

These approaches are strengthened by requirements of national and international Real Estate Portfolio owners who are independent of individually detailed on-site-solutions and who formulate a central and location-independent need for index information from the portfolio-administration. This demand can only be fulfilled by web-based portal solutions which are fully integrated in ERP- and CAFM systems. For the target group, which consists of service providers, the economic efficiency of IT investments plays a significant role. This is due to its portal solutions attractiveness for gaining customers and its ability to fulfil the requests of international customers for information management.

RECOMMENDATIONS FOR A SUCCESSFUL CAFM IMPLEMENTATION

From the experiences of the case studies a couple of recommendations can be derived. They can be used as a simplified check list for the company’s CAFM implementation. The introduction of a CAFM system requires the utilization of methods of change and project management. The people in charge of the realization have to be equipped with adequate competences and responsibilities. The maximum support of the project by the management and the adequate qualification of the affected employees is of great importance. During the phase of the CAFM implementation following key success factors can be found continuously:

- Efficient data collection and data maintenance
- Projective procedure – step-by-step introduction
- Integration of the decision makers and the affected employees.

Table 1: Recommendations for a successful CAFM implementation

- In the beginning all affected personnel including the management should be involved. This eliminates a lot of resistance against changing processes,
- Participation of a group of people on important project decisions,
- Professional project marketing. Not only the FM department, but also the employees of all other organizational units have to be convinced of the advantages and user potential,
- During the realization of the project clear goals and milestones have to be defined; thereby, success can be verified and presented to the corporate management,
- Determination of the application areas in which CAFM is highly beneficial,
- Formulation of a sufficiently detailed requirement specification including tasks and obligations,
- Clarification of the data basis,
- Selection of the correct collection of data and technology of data maintenance,
- Definition of a pilot project which delivers measurable results in a short period of time,
- The project should stand on an integrated basis. Often, the purchase of CAFM software is considered as the end of the CAFM project. A CAFM project consists of the preparation of the project, the identification of basic principles, the process of system selection, the data collection and data transfer as well as project controlling,
- Development of an overall budget. During software projects, the training and introduction of employees is often an underestimated cost factor,
- Never equate the cheapest contractor with the best contractor,
The software should always be adjusted to the operating activities,
- Put a lot of emphasis on the usability of the software. Users are often impressed by the awesome functionality of the systems,
- Test the comfort of usability,
- Examination of projects reference of the software contractor,
- If necessary, involvement of external support (consultants).

The results of the research project have been extensively presented in a book entitled: Computer Aided Facility Management im deutschsprachigen Raum, CAFM-Praxiserfahrungen aus Deutschland, Österreich und der Schweiz (May et al. 2007). In the following, an evaluating matrix will be shown as an example.

Table 2: Example of analysis from the survey

<table>
<thead>
<tr>
<th>Data of the company</th>
<th>Experiences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name:</strong> xyz</td>
<td>• Clear goals and a clearly defined project framework prove to be very helpful.</td>
</tr>
<tr>
<td><strong>Type of organization:</strong> public</td>
<td>• The involvement and commitment of the management is a basic requirement for the success of a CAFM project. In this situation, a project leader belonging to the management is a very important factor.</td>
</tr>
<tr>
<td><strong># real estate properties:</strong> 2,700</td>
<td>• The internal and external marketing of the project is a determining factor, but it is often disregarded. The marketing includes a transparent information policy for persons both inside and outside the company. Through active involvement, in addition to a transparent marketing policy, the persons affected become participants.</td>
</tr>
<tr>
<td><strong>NUA:</strong> 2,200,000 m²</td>
<td>• The collective procurement of the CAFM software and the capacity of data collection and data maintenance can develop towards an interesting model in the area of CAFM. Thereby, the risk of the initiator decreases.</td>
</tr>
<tr>
<td><strong>Duration:</strong> 2002-2005</td>
<td>• Different IT systems with reference to FM are already in operation.</td>
</tr>
<tr>
<td><strong>Software used:</strong> SAP</td>
<td>• The heterogeneous landscape of data causes problems. For this purpose, the connection between ERP systems to a CAFM software is missing.</td>
</tr>
</tbody>
</table>

**CONCLUSION**

The main conditions for successful CAFM implementations are faultless project management and well prepared coordination with the company’s processes and the resulting user prospects. An essential criteria for success is the integration of the affected employees during the decision making process. An introduction strategy turns out to be advantageous when it starts step-by-step with those project intervals that verify the benefits of CAFM. An accompanying project marketing strengthens the acceptance within the company. Additionally, it contributes essentially to the success of the project.
Subsequently, an analysed example of a CAFM project will be presented. In addition, it will be summarized in reference to the success potential during the introduction. It should be kept in mind that the introduction of a CAFM system in particular supports and improves the FM processes. This requires a systematic analysis of those processes during the implementation phase. Our research shows that the maximum saving potential lies in the improvement of processes and their integration. Those potential savings could be intensified by IT operations.

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