Implementation of CAFM for Effective Economic Evaluation

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Abstract
In general, all organizations, whether public or private, use buildings, properties and services (support services) in order to support its core activities. By coordination of these assets and services; use of management skills and incorporation of various changes in environment; Facility Management (FM) affects its ability to act proactively and ensure all its requirements. The aim of FM is to strengthen (in terms of main production flow) boundary processes and systems, to allow workers (with their help) give better performance and contribute to overall success of business organization. Present article deals with economic evaluation of effective CAFM software implementation in manufacturing company.

Keywords: Facility Management, CAFM, Manufacturing Company, Evaluation.

1. Facility Management [FM]
Facility management deals with synchronizing activities supporting main company activity by managing staff administration, auxiliary work activities and business environment - activities related to care of real estate, building and selected employee administration. According to IFMA association definition, FM is “Method of organizations alignment of work environment, workers, and work activities. It incorporates principles of business administration, architecture, humanities, sciences and engineering.” [3, 6]. It is a broad field covering full range of specific activities from cleaning, security, safety to maintenance, inspection, repair planning, purchasing new equipment and construction activities. For this software support is widely used –where crucial role is played by information systems that provide comprehensive offer covering all areas of administration, operation of buildings, as well as various office applications, CAD tools and wide range of small, individual applications, especially for recording various services and activities - comprehensively described as CAFM - Computer Aided Facility management. “Facility management is integration of activities within the organization to ensure and develop agreed services which support and enhance the effectiveness of its primary activities.” [4]

Definition of IFMA association can be expressed in graphical form (see Figure 1). In this diagram, it is evident that facility management can be characterized by three areas that are interconnected.

1. People area, i.e. HR and sociological aspects
2. Processes area, i.e. performance and funding
3. Place area, i.e. architecture and engineering.

First two areas (people and processes) are the same in all fields of management, as management is common factor. It is a set of activities arranged for a group of people. For facility management is specific third area, designated as a “place” (or area). Facility management manages actions utilizing optimal space designed for in the building. It does not mean all activities, are connected with space, but activities that can increase the quality of space, and promote their optimum use. From above statements it is possible to define the basic objective of facility management:

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"The aim is to strengthen those organization processes by which work and workers by their best performance, ultimately contribute positively to economic growth and overall organizational success" [1].

2. FM in Manufacturing Company

Any integration in FM always starts with data

- space (spatial passportisation)
- assets (technical passportisation)
- individual elements and buildings parts

For larger businesses data go into hundreds or thousands items so it requires specialized software products called CAFM, that already have been utilized in enterprise-wide information system [2].

Facility management can be introduced any time in a company. Thanks to this innovation, optimization of support activities is being carried out. Management of these activities in the company is ensured either by internal form (by their own employees) or external form. The second method is called outsourcing. However, the company may choose a combination of these two methods (partial outsourcing) [3].

2.1 Ensuring Software {SW} Products

Complex management and asset management, workflow management, required resources management and monitoring and evaluation of financial costs are nowadays almost impossible without use of computer technology. IT administrators currently use typically several information systems. These are mainly Maintenance Information Systems (MIS) of distribution companies in areas of water, gas, energy and telecommunications, which do not require the use of geographic information system (GIS), which is based on quality of input data. MIS systems can be described as a

integration of CAFM and CMMS systems. CAFM systems are already linked with GIS and CMMS system, taking over the operation and maintenance of technologies that may be contained also in CAFM system.

Information about economic issues is the contents of economic information systems (EIS). Here is a possibility to complete information infrastructure to support processes through specialized FM IS (IS CAFM), dealing with organization supporting activities by agenda of MIS and EIS.

CAFM is a software system for management support processes, based on graphical representation of management area (CAD) with powerful database information support. The aim is to streamline the use of supporting operations, precisely addressing cost items and creating information base for quick decision management [5].

2.2 Way of Providing SW for Facility Management

Currently, for facility management area, are available different software solutions and sophisticated systems in the market. It is necessary to decide for what processes FM will be used and how they can respond to future expansion needs when acquiring one. Areas, which FM SW can solve are:

- assets passportization, including graphic data,
- assets (buildings) management and maintenance
- real estate records, inventory of assets,
- tenancies management, warehouse management,
- registration and administration of medical devices,
- accounting and assets tax records,
- budget, investment management,
- documentation and contracts
- fire protection, training, health and safety,
- revision tracking, servicing and inspections,
• vehicles - fleet management and maintenance
• management of energy costs,
• migration, cleaning and more.

Apart from above mentioned areas SW should be further evaluated, if they are user friendly (they have a clear and innovative operation without complicated training and incorporation). Last but not least is the crucial aspect, its price. It is important to realize that buying software can be connected with other ancillary expenditures for hardware, maintenance and subsequent updates. However, if not updated, software, will lag behind current trends legally and technically. It is there fore necessary to pay careful attention when planning investments in software, especially selection of suppliers. It is recommended to monitor what products are available in the market and what is their price (in terms of acquisition, customization, implementation, training, helpdesk, updates, etc.). Often behind the term of customization, hidden costs render purchased software more expensive than original estimations. Facility management and simultaneously new software technologies to support, is still evolving. When selecting, it is important to consider whether software products are sufficiently reliable and amenable for further developments in relation to practical requirements. Without ensuring software stability and development, the user can face a situation resulting in an obsolete system, requiring software from another supplier.

3. Economic Evaluation of Effective CAFM Implementation in a Manufacturing Company

Many systems have evolved gradually, at present. Object managers, asset managers, operators of buildings, maintenance managers and operations technologies, all of them sooner or later will understand that computer technology can significantly help them in their daily work. In addition to software companies and programmers in particular, young operators created small database programs and these programs have been implemented for each activity and FM processes solution. Besides these, however, there still exist a small number of applications, designed for a purpose, other than for repeated recording and planning activities. For this purpose any program, working with calendar with reminder function can be used.

As Šebo [7] says, equally important role in office applications, programs for e-mail communication containing next to calendar functions as scheduled options and possibilities of defined tasks with subsequent records. Nowadays still small applications for sub-areas are used by FM, because numerous supporting processes accompany almost daily all entities, apart from business- in practice, for example programs for:

• OHS and fire protection
• systems of waste management
• log books and supporting fleet evidence
• Retention and filing applications for enterprise archive.

Real estate and equipment companies are approximately 35 percent of assets and cost; while maintenance management is approximately 40 percent of current costs. CAFM software deployment can reduce these costs up to 30 percent; while the cost of system deployed annually, can just save 1.6 percent of the cost [4]. While these are strong arguments for deploying such a system, in practice, only four percent of organizations presently use CAFM system.

First important feature of CAFM systems is close integration with GIS and CAD systems. The software provides a tool that manages the issue of utilities, land and buildings outside communication, manages data on personnel, processes; a closed polygon depicts each CAD system.

In every system, which is referred as CAFM following modules should identify or at least partly:

• Area management and administration module,
  Graphical information is in many cases much more informative than displaying of attribute data. Areas within buildings, data with high added value, particularly their unique link to a specific area is clearly viewable by graphic tools.

Figure 3. Integration of information systems [3].
The combination of graphic information with descriptive data stored in a standard relational database, however, provides evident advantages in calculating the exact area that can be rented at any given time. The need to clean or paint that area is a common task of facility management, and not just calculating the area of Tenancies.

- Control and management of infrastructure, especially IT infrastructure module
- Control and management of buildings and equipment module,
- Management, administration and inventory of movable property module,
- Links to CAD and GIS systems management.

Other applications are processed in various systems. They are mainly about reserving rooms and jobs, fleet management and vehicle booking, dispatching, scheduling and project management, relocation support module, financial and capital project management, simulation unexpected events management safety and risk assessment, registration, management of hazardous materials and waste management.

Real estate and infrastructure constitute more than 35% share in total assets of company. CFOs, are presently looking for means which will meaningful increase asset utilization, improve service quality and reduce cost of infrastructure maintenance.

Transforming business practices, risk reduction and optimizing asset utilization are critical and complex challenges faced by world organizations. The ability of CAFM system to use innovative approach to changes and transformations are depicted by data visualization simulation results, of potential changes. Strategic decisions, involving less risk, can be taken.

Surprisingly, the entire system can be deployed faster than expected; in 30 days, this system can modulate necessary acquisition and transformation. Such information system yielding within such a short period of time set of related processes, necessitates learning of user habits. These factors are limited in terms of time [4].

### 3.1 Benefits of using FM in an Organization

- easy viewing, editing and managing all detailed company requirements
- transparency
- daily updates
- structuring digitally-led documentation in all areas of administration,
- capture surface load, the data about the machines, operation, handling areas, etc.
- data management (e.g. connect project data HLS ELT and FM data)
- used planning and project documentation is current,
- cost savings,
- reduction of operating costs (up 30%) and reduced space requirements (up to 40%)
- coordination and integration of support activities (within organization, even when outsourcing)
- synergistic effect in supporting activities,
- more efficient use of space organization,
- FM can be used as a strategic overview for planning or for more accurate accounting and inventory, as well as for distribution of rent and depreciation, resource optimization and also for addressing its cost.

### 3.2 Cost of Implementation

Price for work is calculated individually (each house is different in terms of:- different furnishing technological equipment, staff and working hours and material costs. Therefore, for a given objective specific calculation is processed based on inspection and entry requirements of the client. For detailed cost calculation view Table 1.

### 4. Conclusion

The ever increasing demands for environmental quality in buildings and quality of surrounding external environment trigger the need for proper design of buildings that meet standard requirements of indoor environment. Facility management is a profession that involves
### Table 1. Cost of implementing facility management

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment maintenance</strong></td>
<td></td>
<td></td>
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<tr>
<td>Technological equipment maintenance</td>
<td></td>
<td>220 CZK/hour</td>
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<tr>
<td>Specialist (periodic activity on technologist, facilities)</td>
<td></td>
<td>300 CZK/hour</td>
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<tr>
<td>Operating techniques (periodic activity)</td>
<td></td>
<td>420 CZK/hour</td>
</tr>
<tr>
<td>Service of equipment, inspection</td>
<td></td>
<td>Individual calculation</td>
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<tr>
<td>Emergency crew visit</td>
<td></td>
<td>350–600 CZK/hour per visit depending on visit type</td>
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<tr>
<td>Emergency crews work</td>
<td></td>
<td>300 CZK/hour, 380 CZK/hour on holidays</td>
</tr>
<tr>
<td><strong>Follow-up services for facility operations</strong></td>
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<td></td>
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<tr>
<td>Caretaker (handyman, plumber, locksmith, electrician)</td>
<td></td>
<td>220 CZK/hour</td>
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<tr>
<td>Mailroom worker</td>
<td></td>
<td>140–180 CZK/hour</td>
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<tr>
<td>Operational technician</td>
<td></td>
<td>250–340 CZK/hour</td>
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<tr>
<td>OHS and fire protection</td>
<td></td>
<td>350–420 CZK/hour</td>
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<tr>
<td>Supply</td>
<td></td>
<td>150 CZK/hour</td>
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<tr>
<td><strong>Energies, media, waste</strong></td>
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<tr>
<td>Power engineer</td>
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<td>250 CZK/hour</td>
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<tr>
<td>Ecologist</td>
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<td>500 CZK/hour</td>
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<tr>
<td><strong>Administrative economic services</strong></td>
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<tr>
<td>Representing owner of institutions concerned and third parties</td>
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<td>200–280 CZK/hour</td>
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<tr>
<td>Administrative work</td>
<td></td>
<td>170–220 CZK/hour</td>
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<tr>
<td>Accounting - billing</td>
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<td>Individual calculation</td>
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<tr>
<td>Operating costs optimization</td>
<td></td>
<td>Individual calculation</td>
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<tr>
<td><strong>Reception and security</strong></td>
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<tr>
<td>Security</td>
<td></td>
<td>95–110 CZK/hour</td>
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<tr>
<td>Receptionist with world language knowledge</td>
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<td>128–180 CZK/hour</td>
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<tr>
<td><strong>Cleaning services</strong></td>
<td></td>
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<tr>
<td>Regular daily</td>
<td></td>
<td>0,85–1,2 CZK/m²/ day</td>
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<tr>
<td>Window cleaning</td>
<td></td>
<td>8,50–11,50 CZK/m²</td>
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<tr>
<td>Hourly billing rate</td>
<td></td>
<td>98–150 CZK/hour</td>
</tr>
<tr>
<td><strong>Management of residential buildings</strong></td>
<td></td>
<td></td>
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<tr>
<td>Complex accounting conducting</td>
<td></td>
<td>80 CZK/unit</td>
</tr>
<tr>
<td>Administrative and technical management including building representing (size resp. number of units in building)</td>
<td></td>
<td>80 CZK/unit</td>
</tr>
<tr>
<td>Manager reward (depending on size respectively. number of units in the building)</td>
<td></td>
<td>50–120 CZK/unit</td>
</tr>
</tbody>
</table>
multiple disciplines to ensure functionality of the built environment by integrating people, place, processes and technology. Controlling the quality of support processes is still the current key agenda. Processes supporting activities are built on data about space, property, or involving various components and parts of objectives. Now modern software simplifies and streamlines management structures helping to maintain FM standards.

5. Acknowledgement

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6. References


