CASE STUDY: IMPLEMENTING A CMMS FOR MAINTENANCE MANAGEMENT IN A UNIVERSITY CAMPUS

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ABSTRACT

Implementing a CMMS in any organization where there are equipment comes as a necessity to organize and manage the daily activity of the maintenance department. In a university campus – a set of facilities with great diversity of equipment, high activity level and practically without interruptions – the maintenance management is a transversal process that must be well planned and structured from the beginning.

This case study details the implementation of a CMMS at the University of Trás-os-Montes e Alto-Douro campus, with the main goals of identifying and inventorying the equipment of the most important systems, characterize the main preventive maintenance plans and provide a history of interventions in order to obtain reliable KPI (Key Performance Indicators).
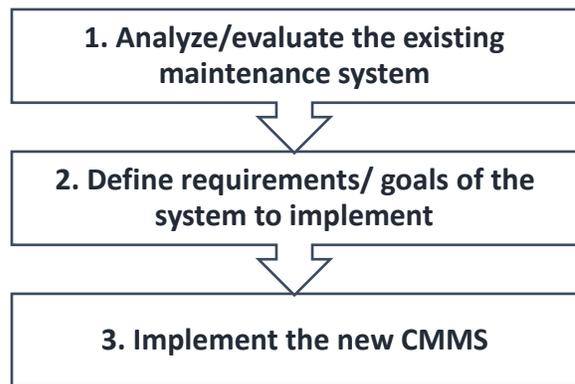
MAINTENANCE MANAGEMENT – WHY?

Any equipment can suffer a malfunction that will affect or stop its operation and the systems that depend on it, making it necessary to have maintenance plans and procedures in order to maximize the equipment performance, ensuring their smooth and efficient operation and trying to prevent malfunctions, so failures and stoppages in operation can be minimized (O'Donoghue & Prendergast, 2004).

Maintenance management can sometimes become quite complex and to help with this task, there are Computerized Maintenance Management Systems (CMMS), tools that allow us to manage equipment and the respective maintenance work and produce analysis and Key Performance Indicators (Cabral, 2012).

IMPLEMENTING A CMMS – STEP BY STEP

The implementation of a CMMS comes as an opportunity to improve the existing organization and procedures. To achieve the actual implementation, there are two essential steps, whose function is to support the decision of the tool that will be used. In this way, the logical sequence to implement a CMMS in a company will be (O'Donoghue & Prendergast, 2004):

> **1. Analyze/evaluate the existing maintenance system**
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> **2. Define requirements/ goals of the system to implement**
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> **3. Implement the new CMMS**

CASE STUDY: UNIVERSITY OF TRÁS-OS-MONTES E ALTO-DOURO

The University of Trás-os-Montes e Alto-Douro is a Portuguese university, located in the north of the country (Vila Real), which hosts more than eight thousand users, distributed by approximately 40 buildings in an area of 130

hectares. The maintenance is necessary for the proper functioning of the university facilities and to maximize the performance of the Technical Support, Maintenance and Security Unit (UATMS) – maintenance department – UTAD decided to implement a CMMS.

In a first instance, the existent system was analyzed, which consisted of an internally developed app to process the maintenance request to the UATMS. The requests received through the platform were transformed into work orders, on paper and without centralizing the information, when approved by the UATMS manager. The maintenance plans were the responsibility of each technician and there were no centralized records of these. Also the work reports were carried out monthly by the technicians, without detail and quantification of the resources or the unavailability period of the equipment subject to the maintenance interventions, making it difficult to obtain indicators.

Based on this analysis, it was decided that some of the requirements of the CMMS to implement would be:

› Centralized record of the equipment and respective maintenance plans;

› A tool to create, manage and centralize maintenance requests;

› E-mail alert notifications;

› Warehouse management tool;

› Analysis and reports that allow obtaining KPI.

Thus, it was chosen a CMMS that fulfilled the above referred requirements and, for the 12 more relevant buildings, there was included a survey of the equipment belonging to the HVAC, Fire Detection and Control, divisions and lighting

systems, electric panels, elevators and audiovisuals.

Regarding the data gathering, here are some recommendations to avoid some unforeseen events:

› Adopt a survey system and respect it, to ensure consistency of information;

› Be aware of the coding system used, if any, and label any equipment that may lack identification;

› Base the survey on updated plants, which serve as a guide in the spaces covered;

› Photograph all the equipment that was surveyed;

› Gather equipment documents such as user manuals or warranty / inspection certificates in digital form.

The CMMS implementation at UTAD is a good example for large-scale institutions, with multiple buildings. The work schedules lasted for three months and during the summer period – when the campus activity is more moderate. The pilot building concept was used and for this, the equipment data was gathered and imported to the CMMS. Concerning the importation step, it is important to organize the information in a way to create a good basis for the upcoming work. The functional organization is a key element for a well succeeded implementation. For the university campus, being a facility with multiple buildings, it is suggested to adopt the FSys – Facilities Systematization, provided by Navaltik Management (Navaltik Management, 2014) for each one of the buildings. In this way, if there is an anomaly, it will be possible to easily identify the extent of it and the affected areas or services and also to obtain well defined indicators for each building, which will later allow to analyze

and compare parameters such as the failure rate or maintenance cost.

Within the scope of the CMMS implementation at UTAD, after importing the equipment belonging to the pilot building, the users training was followed. In this way, it was possible to familiarize the technicians with the CMMS and allow them to start recording all the maintenance actions regarding the pilot building in the system.

After completing the importation stage, it is important to define the functions of the several users and the internal procedures, in order to avoid that the CMMS is stagnant, only with a "data base" function and to ensure that the information inserted into the CMMS by the technicians is valid and allows obtaining reliable indicators. Finally, having all these steps completed, it remains to make use of the CMMS resources and, by feeding it with daily maintenance information, take advantage of the provided analysis and optimize the maintenance management.

Regarding the maintenance management at UTAD, in addition to answer the direct necessities previously mentioned, the CMMS implementation may have other positive impacts, such as the improvement of the operability and performance of the equipment, the optimization of maintenance costs, motivation of the maintenance team on daily activities and, possibly, the favorable contagion of the other functions of the entity and also the qualification of the procedures required by the norms of Quality, Safety and Environmental protection.

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