

Benefits of Maintenance Management Software. Reflecting on a Study of the Portuguese Market

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1. INTRODUCTION

Maintenance has evolved significantly over the years. Investment in technology, together with adequate maintenance management, will likely continue to contribute to the profitability of an organisation. This article is based on a master's dissertation addressing the benefits of maintenance management software [1]. Studying the need for a CMMS (Computerised Maintenance Management System) helps us to determine why it is considered to be an indispensable tool for organisations that seek well-structured and coordinated maintenance.

Together with the academic work, this article provides, through the lens of consultancy in maintenance management, a brief reflection on the way in which certain studied benefits can be obtained.

The advantages of IT systems for maintenance are well-documented, and with this information, it is possible to respond to a variety of differing problems in the field of maintenance. Nevertheless, some existing literature claims that these tools are seldom fully exploited by companies, or projects are unsuccessful because they fall short of reaching these forecasted benefits. These situations underpin the need for both further study in this area and present perspectives that aid improved decision-making in maintenance, from the perspective of the vendors of these systems and the companies that are either current or prospective users.

Within the dissertation mentioned earlier, various benefits resulting from the implementation of a CMMS have been noted. That study included a questionnaire completed by Portuguese companies from different sectors, with the aim of determining a scale of importance for each benefit and evaluating the rate of approval for the implementation project of a CMMS by organisations.

To acquire representative data, only one answer per company (from those individuals responsible for the project) was requested. From a total of 104 participating companies, 97 responses were

counted as valid, after the exclusion of those who did not use a CMMS.

As implied, this article delivers an answer to a limitation within the academic work and seeks to reflect on the way in which a CMMS contributes to some of the analysed benefits. It is also important to mention that this study finds that 25.8% of companies do not use maintenance indicators, and there is room for improvement when defining metrics that guarantee better control, with evident gains for maintenance management.

2. PRESENTATION AND ANALYSIS OF RESULTS

This section details the results and analysis of the main data obtained in the academic work, including the benefits uncovered by different organisations that use CMMS and the evolution of maintenance management in terms of problems that are commonly found.

2.1. Measuring benefits of using CMMS

Figures 1 and 2 display the results procured from the study mentioned previously, along with the purpose of evaluating both the benefits for organisations when using a CMMS and the degree of explicitness for each of these benefits. It should be noted that, among these various benefits deriving from the use of a CMMS, the most relevant ones were selected according to specific criteria based on the level of importance and the range of benefits for the population of the study.

Figure 1 shows the balance between companies replying in a positive or negative way for each benefit, excluding companies that opted not to reply or those that did not know. It can be asserted that most companies acquired the benefits that were listed, in that, barring energy consumption reduction, all benefits are obtained by at least 74.2% of the organisations.

Figure 2 displays the benefits gained by companies, according to the analysis, under four levels presented in ascending order, corresponding to the degree of explicitness: Benefit is perceived; Benefit can be measured; Benefit is effectively measured; and Benefit is evaluated in value (€).

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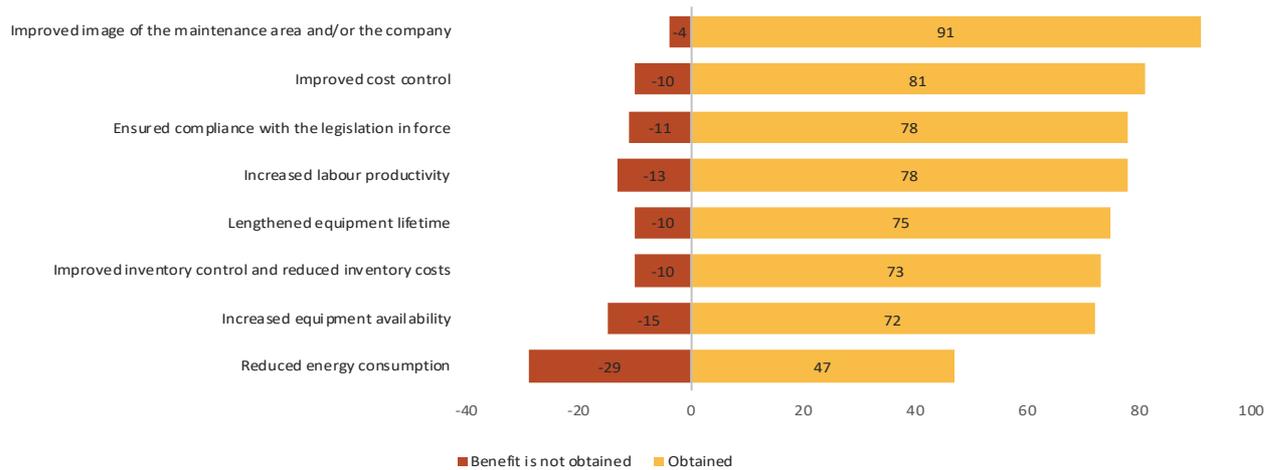


Figure 1 – Benefits achieved by companies with the support of a maintenance management software

Improved image of the maintenance area and/or the company

Improving the image of the maintenance area is the benefit that was acquired the most by the companies participating in the study, with 91 participants (95.8%) responding in this way and only four replying alternatively. It is also a benefit that can be considered as, in some cases, less tangible. Although it is possible to financially quantify the image of the maintenance sector, there are undeniably other benefits that are more tangible. The fact that only 3 companies were able to display this benefit as a financial value is demonstrative of that.

Improved cost control

Improved cost control is also a crucial gain, attained by 81 of 91 companies (89%) that answered the question, implying its necessity due to the fact that it can, for instance, provide a pivotal contribution in helping companies to take more informed decisions. Seeing as this benefit permits more companies to translate their maintenance into a financial value ($n=18$), this indicates that CMMS is perceived as a tool that enables companies to acquire the necessary data to make technical and financial decisions.

Ensured compliance with the legislation in force

This benefit is obtained by 78 companies (85.7%), a significant yet predictable figure given the rigorous attention and care required in a field such as maintenance. It should also be noted that only one organisation quantifies this benefit in a financial value, implying that most companies plan to avoid financial losses as a result of non-conformities. Understanding the way in which a CMMS can improve maintenance procedures that demonstrate compliance and consider financial losses from

non-compliance with requirements, are pivotal questions in comprehending and evaluating the contribution that the CMMS can offer in accordance with current standards and government legislation.

Increased labour productivity

Data shows that 78 of 90 companies (86.7%) increased labour productivity. This can be considered a benefit essentially perceived, since 30 companies claim to perceive it, 28 are able to measure it, 15 measure it effectively and only five manage to assign a financial value to the benefit obtained.

Lengthened equipment lifetime

Another benefit gained by most companies is the extended lifetime of the equipment, with 75 of 85 companies (88.2%) asserting that they receive this benefit. It can be generated via an effective preventive maintenance policy, using a CMMS to plan and schedule preventive maintenance. The data demonstrates that although many companies obtain the benefit, only 4% of those assign a financial value to it.

Improved inventory control and reduced inventory costs

Improved inventory control and reduced inventory costs is a benefit reported by 73 companies (88%), while ten did not acquire this benefit. Almost 18% of organisations claiming this benefit display it as a financial value. This value, which is high in comparison to other benefits, demonstrates the importance of warehouse management for maintenance.

Increased equipment availability

This benefit is acquired by 72 of 87 companies (82.8%) that answered this question. The high number of companies increasing their equipment availability demonstrates the importance of this benefit, which can be critical to the production and operation of companies, and, in many cases, can offer a lot of value to companies. Hence, it is somewhat surprising that the questionnaire data reveals that this seldom translates into financial

terms, with only two companies confirming that they ascertain this information.

Reduced energy consumption

Concerning the benefit arising from reduced energy consumption, of the companies participating in the study (n=47), it is the least acquired benefit. Nevertheless, the fact that 10.6% of the companies that obtain the benefit are able to calculate a financial value suggests that some companies are

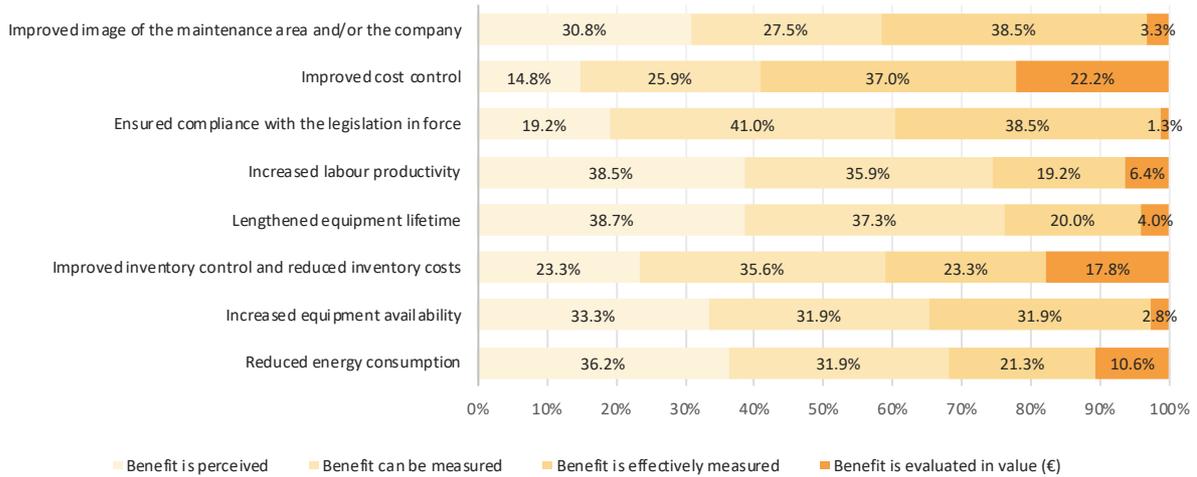


Figure 2 – Level of benefits achieved by companies with the support of a maintenance management software

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keen to carefully assess the savings resulting from controlling energy consumption.

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2.2. Problems in maintenance

The benefits attained from the use of a CMMS are often associated with practices that solve common problems in the maintenance area. With that in mind, Figure 3 displays the problems identified by organisations, before and after the implementation of the CMMS.

The data indicates that the number of companies recognising issues in maintenance management

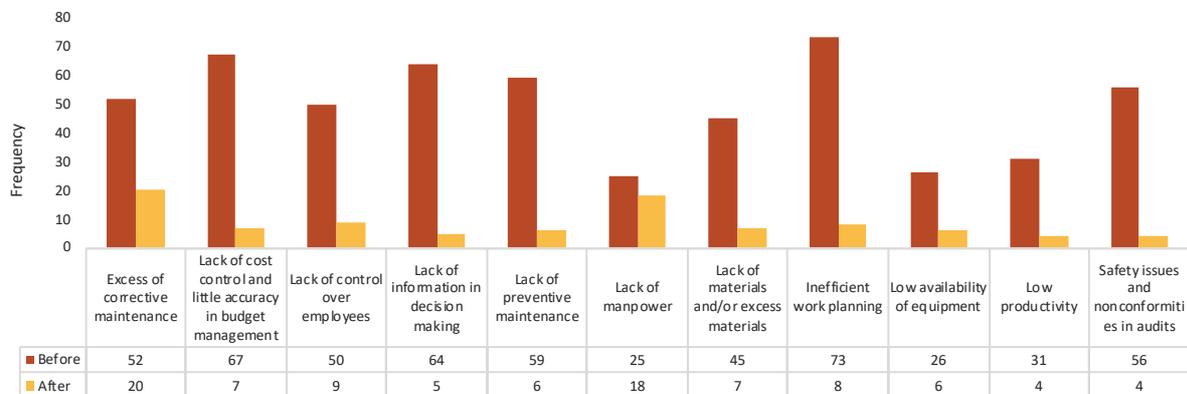


Figure 3 – Problems identified in maintenance before and after the implementation of maintenance management software

before the implementation of a CMMS is noticeably higher than the amount of companies that identify problems after the introduction of the CMMS. Although the use of CMMS should not be the only factor that resolves the existing problems in maintenance, the values derived from this study allow us to verify the importance of a CMMS in solving problems found in this field.

Additionally, another noteworthy finding is that the data acquired when observing the answer "Lack of manpower" shows that it presents the smallest difference between the moments before and after the implementation. This result could be explained by the need to invest more, in that additional employment of labourers is required to compensate the scarcity of resources in the field of maintenance. Another possible explanation is that companies are more aware that the end goal for the introduction of technology is not to reduce the amount of people's work, but rather to improve the efficiency of their work.

3. FINAL CONSIDERATIONS

The results of the study deduce that many companies acquire the benefits presented in the questionnaire, suggesting that CMMS is a highly useful tool for maintenance. Furthermore, the study revealed that only 12.4% of participating companies considered the project to be unsuccessful, a statistic that exhibits the positive attitude towards the system.

Regarding the level of measurement for the following benefits – improved cost control; improved inventory control and reduced inventory costs; and reduced energy consumption – these are the ones with a greater emphasis on the attribution of financial value, and therefore, can be considered as the benefits with the most tangible measurement.

The study also indicated that few organisations calculate the benefits in a way that enables translation to a financial plan.

The results presented by most of the companies surveyed, in terms of the acquisition of benefits via the use of a CMMS, confirm the importance of this software in supporting the maintenance management of organisations.

Although its perception is subjective, the improvement of the image for the maintenance sector and/or the company is, alongside the increase in the overall productivity of the maintenance function, one of the benefits highlighted in particular by managers. This study is, in all respects, supporting previous observations made on this topic. The implementation process of the CMMS might bring

several improvements to the maintenance function, as it is regularly accompanied by a consultancy project in maintenance organisation and management. Thus, it is provided if defined procedures are followed.

The automated production of maintenance reports and indicators within a CMMS is the feature that further justifies the results obtained for some of the benefits presented in the study. Offering relevant data in an flexible manner for the manager contributes, among other examples, to increasing availability and the elongation of equipment lifetime, and for the subsequent improvement to cost control. Hence, it is unsurprising that this is deemed to be contributing important added value, which is often referred to by organizations in relation to the objectives and expectations when using a CMMS.

Work management, a primary activity in the context of maintenance, that is supported by a CMMS, will dispense the necessary information leading to reducing the frequency of breakdowns (notably via a more effective control of preventive interventions), improving overall management, with noticeable benefits in availability, productivity, effectiveness, safety and economic outcome.

In the field of operation in maintenance, compliance with the legislation in force, supported by a CMMS, can be assured more efficiently. The study demonstrates that the control, compliance and record of interventions – for technical certificates, periodic inspections and audits, among others – directly benefit from the use of maintenance management software.

Although the cost assessment should not be the chief objective of maintenance management, to determine, analyze and, on occasion, optimize costs is important for the maintenance management system, as collecting and computing them should allow the manager to perceive them. Still, it is important to observe the principle that a CMMS intervenes in technical matters. Maintenance costs will arise from this intervention.

The success of the implementation of a CMMS in an organization depends, as expected, on different factors. As this process is unsuccessful, the potential offered by the tool will be jeopardized. Nevertheless, for organizations with a well-implemented system, a conclusion seems apparent: the appropriate use of a CMMS introduces several benefits to the maintenance function. The recognition of these benefits by experts in the field – the responsible individuals for managing maintenance – is the most important contribution to this research and the area of maintenance in general.

REFERENCES

[1] FOLGOSA, João David de Meira Coelho Mateus - Benefits of maintenance management software: a study on Portuguese market. Lisboa: ISCTE-IUL, 2018. Master's dissertation. [Consult. 28.06.2019] Available on <http://hdl.handle.net/10071/18286>.