

TOP MANAGEMENT DECISION-MAKING ON ASSET MANAGEMENT SYSTEM IMPLEMENTATION

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Abstract After ISO 5500x series standards were issued back in 2014, a body of literature on asset management and asset management system has been growing. However, implementation of asset management system and its certification have not attracted much research attention. In practice, asset management system is not so widely embraced by top management, even though it supports organizations to realize value from the assets while balancing risk and opportunity, cost and performance. Hence, an interesting research question is arising, i.e., what are the key factors influencing top management's decision to either implement an asset management system or not. After introducing a theoretical background, the paper suggests research methodology. The results of the future research should allow for a better understanding of the top management's decision-making process related to asset management system implementation, and indicate potential areas to be addressed in the future to provide guidance to decision makers.

Keywords:

asset management system, implementation decision-making, influencing factors

ODLOČANJE VRHNJEGA VODSTVA O VPELJAVI SISTEMA OBVLADOVANJA PREMOŽENJA

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Povzetek Po izdaji standardov družine ISO 5500x leta 2014 se obseg literature o obvladovanju premoženja povečuje. Vendar pa uvajanje sistema in njegovo certificiranje doslej nista pritegnila veliko pozornosti raziskovalcev. V praksi sistem obvladovanja premoženja ni široko sprejet s strani najvišjega vodstva, čeprav podpira organizacije pri ustvarjanju vrednosti iz premoženja ob hkratnem uravnoteženju tveganja in priložnosti ter stroškov in uspešnosti. Tako se poraja zanimivo raziskovalno vprašanje, tj. kateri so ključni dejavniki, ki vplivajo na odločitev najvišjega vodstva, da uvede sistem obvladovanja premoženja ali ne. Po predstavitvi teoretičnega ozadja članek predlaga raziskovalno metodologijo. Rezultati predlagane raziskave naj bi omogočili boljše razumevanje procesa odločanja najvišjega vodstva, povezanega z vpeljavo sistema obvladovanja premoženja, ter nakazala področja, ki jih je smiselno obravnavati v prihodnosti, da bi se zagotovile ustrezne smernice za odločevalce.

Ključne besede:

sistem obvladovanja
premoženja,
odločanje o vpeljavi,
vplivni dejavniki.

1 Introduction and theoretical background

Asset management is not a new issue and was in a way carried out from the beginning of the utilization of capital assets, such as buildings, transportation, water systems or production systems of any kind (van der Lei et al., 2012). Hence human engagement in asset management dates back not only decades, but rather hundreds or even thousands of years. Yet, the modern changes in living and business environment made asset management now more important than ever before (van der Lei et al., 2012). The importance of asset management also reflects in a body of the associated research literature. It has grown rapidly over the past 15 or 20 years and the increasing interest of the infrastructure, civil engineering and transportation led to the development of the international standards, the ISO 55000 family (da Silva & de Souza, 2021). If the search with the “asset management” keyword is performed for the horizon of past 40 years, the results are obtained from Scopus in terms of documents published per year, as illustrated in Figure 1, which confirm the rapid growth.

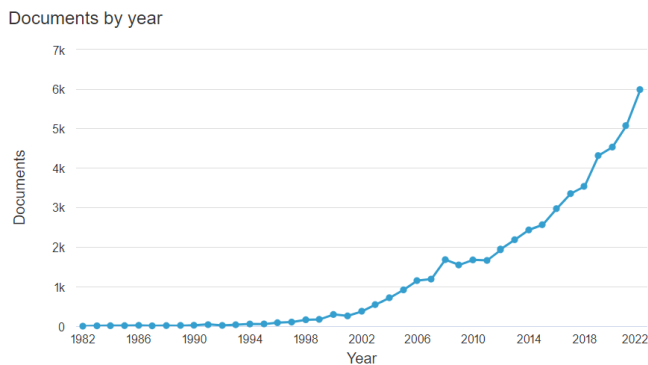


Figure 1: Search results for documents on “asset management” per year

Source: Scopus

The term asset management (AM) has been primarily used in publications in the engineering research (civil, electrical, industrial, environmental and mechanical) and related areas (da Silva & de Souza, 2021). Several different definitions of asset management can be found in literature, however, after the ISO 55000 standard series was published, its definition: asset management are “the coordinated activities of an organization to realize value from assets” (ISO, 2014a) is the most commonly used and as such also represents the basis for further research proposed in this paper. Several authors emphasise AM’s importance especially for asset-

intensive organizations (Komonen et al., 2012; Wilson, 2002). Asset management can also address the challenges of aging infrastructures with extended useful lives and the growing end-user demands for adequate services and at the same time for lower costs and risks (Almeida et al., 2022). ISO 55000 standard defines assets as “items, things, or entities that have value or potential value to the organization” (ISO, 2014a). It does not provide guidance on how asset management should be conducted, yet it describes the elements of the asset management system (AMS). ISO 55001 specifically emphasises the need for the implementation of an AMS by adapting all relevant processes which participate in achieving asset management objective, i.e., creation of value from assets (ISO, 2014b). There is also growing evidence of positive impacts of asset management on business performance (Lima et al., 2021a), operational performance (Alsyof et al., 2021; Maletič et al., 2020), sustainability (Maletič et al., 2018), business process improvements (Woodhouse, 2019), efficiency (Ramalho et al., 2020), etc. However, many organizations are still hesitant regarding the AMS implementation. As of today, there are less than ten organizations certified in accordance with ISO 55001 in Slovenia and low level of certifications are reported in some other countries, as well, e.g., Brazil (Carolina et al., 2020). While, on the other hand, some countries like the USA, UK, Australia and Malaysia have established policies, manuals, guidance, procedures, standards and IT systems at the governmental level to support AM implementation (Nasir et al., 2022).

The implementation of AMS has not been addressed extensively by the scientific research so far. As mapping of literature on asset management revealed (da Silva & de Souza, 2021), within 2,449 documents identified and analysed, the keyword “asset management” was the most frequent with 674 occurrences, “system” was in a third place with 181 occurrences, while the keyword “implementation” was not even identified amongst 22 most appeared keywords.

In searches performed in the Web of Science and Scopus mid-January 2023, different combinations of keywords “asset management”, “system”, “ISO 55001” or “ISO 55000” and “implementation”, provided results as depicted in Table 1.

Table 1: Search results for different keyword combinations

	1	2	3	4	5
	“Asset management”	“Asset management” + “System” + “ISO 55001”	“Asset management” + “System” + “ISO 55000”	“Asset management” + “System” + “ISO 55001” + “implementation”	“Asset management” + “System” + “ISO 55000” + “implementation”
WoS	12,225	15	26	7	8
Scopus	52,297	196	369	82	162

(Source: WoS and Scopus, January 18th, 2023)

Scopus actually provided substantially higher number of results, yet after review of the documents for the keyword combinations 4 and 5 from Table 1, which were the most interesting for the purpose of this paper, not many more relevant papers proved to be found in Scopus than in the Web of Science. It is worth to be noted that in some documents, the wording “asset management system” had nothing to do with the AMS as defined in the ISO 55000 family of standards. Instead, it described the IT systems supporting asset management. Hence, a conclusion can be drawn that, on the one hand, the topic of asset management is very attractive in terms of research, yet, on the other hand, the implementation of the AMS in accordance with ISO 55000 family standards has not attracted much research attention so far.

The aim of this paper is to propose the research which would go a bit deeper, i.e., explore the main factors that influence the decision-making on asset management system implementation. In the available body of literature, there are very few documents which address that topic; consequently, it is fair to assume that the topic in question represents a research gap. Understanding the factors influencing the decision makers to go for the implementation of an AMS or against it, could help the AM professionals to better support the decision-making process and, by means of the implementation of an AMS, generation of higher value from assets reflecting in better business results. For that purpose, the available literature on benefits, motives and barrier in relation to AMS implementation was searched for and reviewed.

In their study on challenges and barriers to establishing infrastructure asset management (Beitelmal et al., 2017), the authors explored a comprehensive list of potential barriers for implementation of AMS based on the standards that had been used prior to ISO 55001 was published, such as FHWA (FHWA, 2007), PASS 55

(BSI, 2008), IIMM (NAMSG, 2011) and AASHTO (AASHTO, 2013). Even though the aim of the study was to compare the barriers occurring in Libya and in the USA, general barriers listed are still considered potentially relevant for the purpose of the proposed study. The 28 barriers were grouped into seven macro classification categories:

- Planning / decision-making,
- Managerial / organizational,
- Information resources,
- Human resources,
- Social,
- Finance resources,
- Local knowledge.

While the detailed consideration of the barriers may be useful for further research of the topic, it is important to have in mind that the barriers analysed in the study were actually relevant for the AMS implementation after the decision for it has already been made. Hence, many of them may not be related to the influencing factors the proposed research will be looking for. There is one aspect of the study though which may be very relevant, i.e., lack of knowledge. From the experience of the authors of this paper, lack of knowledge and understanding of asset management and AMS is often recognized in the organizations and can well be one of the influencing factors during the decision-making on AMS implementation. In general, barriers discussed in the study (Beitelmal et al., 2017) should be further investigated as they may prove to be useful to some extent in preparation of the interview protocols for the proposed research.

In the case study on pains and gains of ISO 55001 certification (Capela et al., 2020), the authors addressed the challenges mainly associated with the implementation of the AMS, as the certification was more or less a formality once the AMS had been adequately implemented. Again, the results of the study are associated with the AMS implementation process, so they may not be directly relevant when studying the factors influencing the decision-making for or against the implementation of the AMS. Yet, it is worth considering the conclusions of the study indicating the gains, such as more integrative and holistic approach towards all operational asset initiatives helping the company to achieve greater efficiency and, hence, higher ROA.

The study on motives for and barriers to implementing asset management system (Maletič et al., 2022) was conceptually the most relevant found for the scope of the future research proposed in this paper. The authors initially recognized the fact that the motives and barriers in relation to AMS implementation had previously not been addressed in the scientific literature. Consequently, the study was established on a set of measures derived from previous studies on Quality Management System (QMS) and Environmental Management System (EMS) implementation, as the structure of ISO 55001 is comparable to the one of ISO 90001 and of ISO 14001. The study analysed the relevance of the following motives for (both internal and external), as well as barriers to the AMS implementation:

Internal motives:

1. To combat poor quality performance,
2. To build a foundation for a systematic management,
3. To have better control of operations of the business,
4. To provide a foundation for continuous improvement,
5. To realise the company's strategy to pursue quality.

External motives:

1. To meet customer's demands,
2. To match competitors' actions,
3. To enhance the company's image,
4. To gain preferred supplier status,
5. To comply with industry policies or regulations.

Barriers:

1. Additional costs for implementation,
2. Duration,
3. Lack of resources,
4. Lack of time,
5. Increase in documentation and bureaucracy,
6. Lack of knowledge and skill.

The study provides several insights into the motives and barriers, as well as their influence on the AMS implementation, yet those motives and barriers had not been identified specifically for the AMS. In order to explore the topic further, the future

research proposed in this paper is to delve into the specifics of the AMS and try to find out which factors influence the decision making on AMS implementation, specifically. While the questionnaire of the research in question was distributed to the middle managers with primary Physical Asset Management (PAM)-related responsibilities for maintenance and operations within organizations (Maletič et al., 2022), this paper builds on the premise that the decision-making on whether or not the AMS is to be implemented is actually made at the top management level, or, in some cases even at the level of supervisory boards. Hence, the research will be aimed at top managers, i.e., members of the management boards or general managers of asset-intensive organizations. Those also bear the responsibility for a successful implementation as the “leadership and workplace culture are determinants of realization of value” (ISO, 2014a). Further, ISO 55000 claims: “Leadership and commitment from all managerial levels is essential for successfully establishing, operating and improving asset management within the organization”. Further, in a change project such as the implementation of AMS, the active and visible role of a primary sponsor is an imperative (Prosci, 2023), and he or she is to be located high enough in the organizational hierarchy to have sufficient authority over all managers of departments which need to adopt the change. In each and every of the 11 benchmarking studies performed by Prosci since 1998 (Prosci, 2020), it has been proven that effective sponsorship was identified as the single most important contributor to success of a change project implementation. Hence, taking into account ISO 55000 and Prosci research, addressing top management in the proposed research seems to be essential for gaining further insights into the subject matter.

The purpose of this paper is to propose a future study that will fill the research gap identified through the literature review, related to the decision-making on implementation of an AMS in asset-intensive organizations.

2 Research question

As indicated in the previous chapter, it would be interesting from the scientific point of view and practically beneficial to better understand the underlying thought process of the decision-makers when they consider implementation of an AMS in their organizations. For that purpose, the following research question is foreseen for the proposed study:

RQ: What are the key factors influencing top management decisions on the AMS implementation?

3 Proposed research methodology

For the future study proposed in this paper, an interpretive case study renders itself to be the most appropriate research methodology. The qualitative case study method was chosen due to the fact that it:

- can help derive rich, contextualized, and authentic interpretation of the phenomenon of interest, and
- is able to discover a wide variety of social, cultural, and political factors potentially related to the phenomenon of interest that may not be known in advance (Bhattacharjee, 2012).

Case studies will be performed in multiple organizations to replicate and compare the analysis with the aim to improve generalizability. Targeted organizations will be asset-intensive ones where asset management has become especially important (Lima et al., 2021b), of large size. To gather more insights into the phenomenon, participating organizations with different attitudes towards AMS will be approached; some of the organizations will have been already certified in accordance with the ISO 55001, some may be considering it and some may have already decided against the AMS implementation at a certain point in time.

The data collection procedure needs to be rigorous to ensure quality and trustworthiness of the study, so face-to-face semi-structured interviews will be performed with top managers or management board members, and those may be combined with some personal observations. As part of the preparation for the interviews, a qualitative semi-structured interview guide (Kallio et al., 2016) will be prepared. As very few organizations which had implemented and certified their AMS in accordance with ISO 55001 so far were identified in Slovenia, the study will be performed among Slovenian organizations. The results are intended to be verified with some subject matter experts and/or expert groups, as well as with expected independent studies from other countries, to improve validity. The proposed model of research design is illustrated in Figure 2:

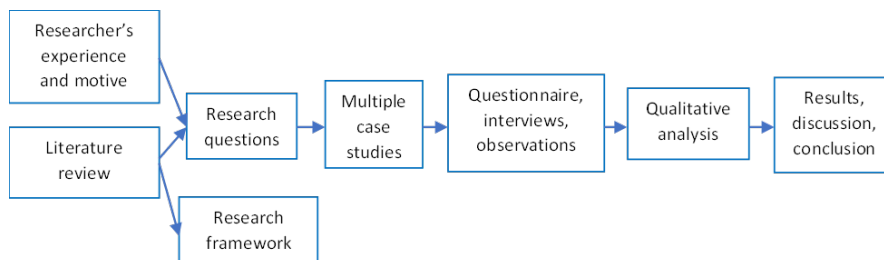


Figure 2: Proposed model of research design

5 Discussion and conclusion

The paper describes the theoretical background of asset management and asset management system, as well as its implementation. The scientific literature on asset management is growing, yet the specifics of AMS implementation proved to be scarcely researched. Even more so, when it comes to the factors influencing decision-making for or against AMS implementation, what was recognised as a clear research gap. That gap can be addressed by the proposed future multiple case study research. Among the expected results of the study is better understanding why some decision-makers decide to implement the AMS and the others do not. The results will enrich current research literature on AMS implementation, especially at the beginning of the motives-adoption-performance relationship, and are expected to be useful in practice, as well. Based on the newly acquired insights from the proposed study, some guidelines can be prepared to better support the decision-making process. That could assist asset management professionals, both practitioners and consultants, to ensure generating more value from assets and hence achieving better business results.

There will certainly be some limitations of the proposed study. As it will be conducted in Slovenia where just a few organizations have implemented AMS so far, the results could be generalized to countries with similar situation, but may not be relevant for countries where AMS implementation is pursued at the governmental level. Further, large asset-intensive organizations will be analysed, focusing on physical asset management, hence the results may not be relevant for service industry and organizations where physical assets are not the main generator of value.

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