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SOFTWARE-AS-A-SERVICE ADOPTION FOR INCREASING ORGANIZATIONAL PERFORMANCE ON SME: AN APPROACH FROM KNOWLEDGE MANAGEMENT PRACTICES

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Abstract

This paper describes from a knowledge management perspective whether the implementation of SaaS (Software-as-a-Service) in small and medium enterprises can contribute to increasing organizational performance. A literature review of the concepts associated with knowledge management practices and cloud computing is conducted as part of the methodology, as well as an analysis of the synergy between them. As part of the findings, the adoption of knowledge management practices can positively moderate the adoption of the new software (SaaS) for organizational performance in a sustainable scope in SMEs.

Keywords

Knowledge management / SaaS Adoption / SME / organizational performance / competitive advantage

Introduction

Knowledge is the most crucial resource for firms to establish a long-term competitive advantage and differentiate themselves from their competitors (Ha, T., *et al*., 2019). It can be presented in organizations as a complex, diverse, and ongoing research resource. As some economic development objectives involve society in general, inclusive growth and innovation, this means, from a corporate perspective, building a competitive advantage through a continuous search for more efficient ways to take decisions and actions. For a significant number of organizations, it is still challenging to sustain their businesses for the mid-long term due to a lack of visionary outlook, planning issues, lack of competitive employees, or a lack of business intelligence (Hossin *et al*, 2021, M. 2021). This situation just gets more impaired when it comes to small and medium-sized enterprises (SME's).

SMEs are an important part of the economy and society. Some of their characteristics in performance include adaptation and flexibility, as well as being an economic engine of employment. SMEs manage to deliver more elevated organizational performance, not only from a financial perspective (in terms of profitability, corporate return, and value creation), but also in productive, operational, innovative, and competitive conditions – which were pointed out as entirely superior to other companies in the market (Dias *et al*, 2019). However, for different reasons, these organizations face challenges throughout their existence in terms of management, performance, and results.

To improve efficiency and effectiveness and be competitive in their markets, companies nowadays consider technological adoption as one of the pillars of their processes. Nevertheless, adopting technology is probably one of the common limitations for SMEs, due to issues associated with economic barriers or knowledge capabilities in the acquisition itself. Cloud computing is playing an innovative and strategic role in technology adoption due to scalability and the opportunity to continue taking advantage of new developments in IT technologies at affordable costs (Sultan, 2012). This happens in the management of information and processes, as well as in the provision of an integrated platform to deliver services to users, based on the pull, on-demand, anytime and anywhere in the world (Ahmad, A., *et al*, 2020)

Software-as-a-Service, as one of the expressions of cloud computing solutions, helps companies to become more competitive in the industry. However, when adopting, companies no matter their size need to adopt an objective approach to ensure they select the most appropriate SaaS solution for their needs (Godse, 2009).

This is one of the reasons why knowledge management practices can be explored as a possible value-generating source that can contribute to technological adoption from its dynamic practices. Among the most common KM practices, SMEs might adopt the most direct or simple practices. Given the relevance in number and importance of companies in society, this document can contribute to the knowledge.

This paper aims to identify and describe, from a knowledge management approach, if these practices can positively moderate the technological adoption of Software-as-a-Service (SaaS) solutions in Small and Medium-sized companies in order to contribute to a more sustainable organizational performance. The questions to explore include:

- Q1: Why should knowledge management practices need to be considered for SaaS adoption by SMEs? and,
- Q2: How can these practices contribute to increasing their organizational performance?

The scope of this paper will consider the research done so far on the topic of technology adoption of SaaS solutions from a knowledge management approach applicable to small and medium enterprises SME. It will be particularly focused on the last 10 years due to the increase in relevant articles in the area. It is expected that this document could contribute to sustainable organizational performance. It is important to remark that the concept of sustainable organizational performance in this article refers to a long-term lifecycle due to a strategic competitive advantage (Hossin *et al*, 2021) and not necessarily to the embed sustainability in the company's strategy and operations as cited by Eccles *et al* (2012).

The organization of the paper is as follows. In the first section, we will provide a literature review on KM and KM-Practices together with the relevance for Small and Medium Enterprises. Chapter two will cover and describe the role of SMEs in SaaS adoption, understand the concept of SaaS, and describe the synergy between both concepts. In chapter three, we will integrate KM-Practices mentioned in chapter 1 and

the ones adopted for SMEs expecting to provide an answer to the second question goal-oriented to more efficient and effective organizational performance.

Methodology

The methodological approach of this document is based on a literature review through databases such as Scopus, Google Scholar, and Semantic Scholar mainly, with articles in English and Portuguese about engineering and business.

The protocols applied in the mentioned Databases included the use of filters with the keywords: “Software as a Service” or “SaaS, “Knowledge management”, “Small and Medium-sized enterprises”, “SME”, “Technology adoption”, and “organizational performance”.

There were used additional tools such as Connected Papers and Vos Viewer from an exploratory perspective to avoid biased research of articles that may not cover academic and professional relevance. Finally, the paper should focus on small and medium-sized companies through empirical and theoretical articles, which can have both quantitative and qualitative methodology.

1. KM-Practices and the relevance for Small and Medium Enterprises

Knowledge management is characterized by knowledge strategies and processes implemented in the organization to increase the effectiveness and efficiency of business processes, achieve knowledge strategy, and sustainable organizational performance (Kordab, 2020). When driving the KM concept to organizations, according to Lotti (2014) organizational learning should include, problem-solving, a culture of new experiences, learning from previous experiences, adoption of best practices, and effective communication within the organization.

Knowledge management's importance began to be realized by executives and researchers in the 1980s with published papers by influenced authors like Drucker, Strassman, Rogers, and Thomas Allen (Sullivan, 2012). Subsequently, it gains more impact since 1990 being applied in more local and global organizations where the initiatives could also be focused on processes with manageable and significant knowledge (Barcelo-Valenzuela *et al,* 2008; Sullivan, 2012). Studies were addressed from pioneer countries like USA, Japan, and Sweden through KM in Artificial intelligence applications, intangible assets, and key assets of organizations (Lotti, 2014). Nowadays, with some differences in the levels or status of development, KM is practically incorporated in all major companies.

The emphasis on knowledge and experience would logically create more elements to interact, support, and become experts in decision-making (Kedebe, 2010). Additionally, some key elements in Knowledge management are the goals definition, identification, acquisition, development, distribution, usage, retention, and

assessment, although the goal definition and assessment are considered for them strategic steps that initiate and conclude the operating cycle of KM (Lotti, 2014).

A traditional approach to KM types explores the concepts as tacit and explicit knowledge considering dynamic knowledge creation as internal or external sources (Chen, 2005; Nonaka, 2003). Following this approach (Lotti, 2014) indicates that knowledge would involve explicit knowledge (possibility to be encoded and stored), tacit knowledge (practical or done by experience), and implicit knowledge (tacit knowledge shared by groups within an organization).

Following (Cerchione & Esposito, 2016) KM practices are defined as the set of methods and techniques to support the organizational process of knowledge management, and KM-Tools like the specific IT-formed systems that support the KM-Practices. Furthermore, as described in the next image (Table 1), two content perspectives are identified in their literature: Knowledge management process and knowledge management systems. The KM process is subdivided into creation, storage, and transfer. On the other hand, knowledge management systems are also subdivided into KM practices and KM tools.

Knowledge management Process	**Knowledge management Systems**
Creation	KM Practices
Storage	KM Tools
Transfer	

Table 1. *KM process and Systems.* Adapted from: (Cerchione & Esposito,2016)

One key indicator they also highlight is that their study does not provide a complete overview of KM-Tools and KM-Practices used by SMEs to support the different phases and use them in the knowledge management process.

When KM takes focuses on investigating activities other practices might include a structural model of knowledge management processes showing the relationship between knowledge creation, knowledge sharing, knowledge storage, knowledge utilization (Zaim, 2018), and knowledge assessment (Lotti, 2019).

Some practices that involve participation have increased in popularity supported also by technologies to monitor and achieve goals and improvements. An important point to consider in strategy is the need for congruence between elections and actions across different organizational levels. Despite the merits of participatory and adaptive practices, many companies are still struggling to adopt them effectively (Doeleman, 2022).

The techniques may include formalization or documentation of the procedure, specifically, when it comes to repetitive tasks. This would improve processes that require a high level of efficiency. It would also involve an innovation culture

perspective to take advantage of keeping knowledge acquired during experienced situations, reducing the level of timing, enhancing the quality, and exceeding client expectations (Lotti, 2014).

For this understanding, it is important to consider the levels of maturity in corporate KM, organized by levels as insufficient, structured, oriented, and integrative KM. These levels also comprise the lowest awareness level of knowledge to the highest level in which besides the awareness, there is also transparency and organization in the processes (Lotti, 2014).

There is a relationship of reciprocity between KM-Tools and KM-Practices. Literature on KM in SMEs shows that they are not simply a scaled-down replica of large companies, (Cerchione & Esposito, 2016) and they are substantially different in many ways, for example, SMEs have advantages over large organizations in that they are less bureaucratic, quick to change, and they also work with different flexibility (Ha, 2019).

One example of these differences can be seen according to Cerchione & Esposito, (2016) specifically in identifying four kinds of strategists for adoption in SMEs: guidepost, exploiter, explorer, and latecomer. Starting with the guidepost (as the innovative and intensive exploitation of the value KM), then the exploiter (traditional user of KM tools not necessarily dedicated just to KM), then the explorer (despite using innovative KM Tools and practices, they invest and learn) and finally the latecomer (as the SME, unaware of the value of KM and generally without resources to be competitive in the KM area). They consider that an in-depth analysis would help to verify if the used strategy would affect the performance of an SME.

In 2019, Lotti conducted a study in which he explored the practices associated with KM in Startups from Brazil. Below (Table 2) it is possible to appreciate the most common practices by the KM processes applicable:

Creation	**Sharing**	**Acquisition**	**Storage**	**Application**	**Assessment**
Internal meetings: team meetings, brainstorming sessions, backl	Internal meetings: team meetings, in-house seminars, weekly talk	Assessments of market or experts: prototyping and pitches	Report, history of Prototyping and testing	Report, history of Prototyping and Testing	Creation of KPIs

og with teams Definition 9.16					
Validation with clients “listen to consumers”		Market research, benchmarking, partnership with startups			Assessment of market or expert: pitches, listen to consumers, concept test
Consultation with mentors		Social interactions: participation in fairs and events, coworking, serendipities, consultation with mentors, paired progr			

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Table 2: *KM Practices on Startups by KM Process*. Adapted from Lotti (2019)

This table describes some of the practices most frequently used by companies in the startup category in terms of knowledge management. In their work, 25 activities were identified, of which these are the most outstanding.

According to (Cerchione & Esposito, 2016) SMEs adopt and use traditional tools (KM-Tools) more intensively rather than new and more updated ones that are generally cheaper and easier to use. This is also because they don't usually have tools to monitor and focus exclusively on the KM process. In the example of table 2, it is possible to estimate that Internal meetings, validation with clients, social interactions, and reports among others validate this statement for the category of SMEs as they remain as traditional tools and they wouldn't have any significant impact for adoption.

Some KM tools commonly include Email, databases, document management systems, video conferences, cloud computing, ERP Systems, Data Warehouses, social media, and conversational technologies. Also, the degree of diffusion of KM practices can be measured by the number of SMEs adopting the KM Tool. Not all tools are used at all, especially those that involve mainly data visualization, prediction and ideas markets, product lifecycle management systems, wikis, blogs, etc. The strategies for using KM practices among SMEs point out how the higher the intensity of the use of KM practices, the higher the intensity of their use of additional KM-Tools. (Cerchione & Esposito, 2016).

As stated by Lotti (2014) companies that are interested in improving the quality of their KM transit through the higher levels, such that a company at a certain level adopts the practices of the lower levels and strives to improve the adopted practices and prepares to adopt the good practices of a higher maturity level. If this performance does not occur and a company SME does not make the effort, the quality of KM can be compromised.

As a result, knowledge-sharing through the exhaustive utilization of tools is still challenging for many organizations along with others because sharing of experiential knowledge cannot be orchestrated, prescribed, or even guaranteed. It is only possible to enable through carefully designed contextual strategies (Marjanovic, 2022)

2. SMEs moving towards SaaS adoption

The growing participation of small and medium enterprises (SME) in the technological environment has intensified in the last years due to globalization and economical

competitive needs. Nevertheless, there are numerous characteristics that differentiate the way they adopt from larger companies, some of which, have been already known (Lunardi *et al*, 2010). According to (Ying, L. *et al*, 2022) technology adoption has direct effects in different contexts such as the economy, environment, and social performance.

SMEs use non-internal means of innovation more than large firms, as they consider alliances or networks as ways to extend their technological competencies, meaning that networking is a crucial strategy to get access to knowledge and thus innovate. As stated by Hervas (2020) organizational innovation, is the implementation of a new organizational method in a firm's business practices, workplace organization, or external relations. SMEs often experience challenges and consume resources trying to achieve results that, to some extent, depend on factors over which they have no control (Dias, *et al* 2019).

Cloud computing advances as a part of an information economy with great possibilities for companies and society. Most of the benefits expected from new revenue or pricing models are based on subscriptions, pay-per-use, or similar methods where the customer pays for the use or result instead of just the product (Parida, 2020).

Although relevant previous research was done on Cloud computing technologies with pioneers such as (Buyya, 2009), just a little bit more than ten years ago, researchers like Malladi *et al.*, (2012), Johanson & Ruvio (2013), Cusumano(2010), Gartner (2010) started conducting SaaS focus, importance, and capabilities. SaaS-based service procurement models create flexibility and new capabilities in organizations and thus enable the administrative capacity to respond to the market and innovate (Johanson & Ruvio, 2013).

SaaS is defined as standard software owned, delivered, and managed remotely by service providers, giving space for several benefits such as cost efficiencies, new functionality, and new opportunities (Malladi, S., and Krishnan, M., 2012). Software as a Service (SaaS) could be also called a "model" of cloud computing and as such seen as a new model for service delivery, which has recently attracted the attention of research and practice (Johanson & Ruvio, 2013).

Despite the significant existing technologies, most of them have been designed mainly for larger companies, mainly because they require significant investments, both in structure and in equipment acquisition; but also, because it requires innovation as a form of change of attitude on the part of the management (Lunardi *et al*, 2010). SMEs configure a different set or variety of external sources of knowledge dependent on SMEs' internal capabilities to innovate (Hervas, 2020).

Brink (2016) also suggests that this innovation, viewed as an isolated new creative idea, is not sufficient. It also requires organizational coordination, learning, and implementation. Therefore, key phases, activities, roles, and the role of customers involved in value creation can help cloud computing adoption (in this case, SaaS) to create opportunities and value from emerging digital technologies (Parida, 2020).

As it is visible, not just management should be involved. Once the employees can evaluate the organizational support they obtain, they act accordingly with a norm of reciprocity (Hossin *et al*, 2021). Therefore, once the employees perceive that the organization is supporting them by recognizing and valuing their contributions and indicating concern for their welfare, they feel obligated to the organization and exhibit higher commitment through increased work efforts, which could help to make adoption properly planned, more organized, effective and efficient.

Nonetheless according to Dias, *et al*. (2020), The organization of SMEs in a collaboration network, by itself, does not necessarily imply more excellent knowledge and more intellectual capital. Their findings suggest that the effort and commitment of all participants, from entrepreneurs to employees, are essential to reduce mistrust and establishing cooperation.

Once a firm gains experience with an activity, this firm systematizes the activities by developing routines for future usage. Therefore, organizations engaged in IT outsourcing and business processes learn from the experience, extending their concept of organizational learning. Likewise, missing financial or technological resources or the presence of an inappropriate organizational structure can hinder or even rule out the adoption of IT in the organization (Lunardi *et al*, 2010).

Other elements that need to also be considered on IT adoptions include but are not limited to economic constraints (such as periods of recession, great competition and low-profit margins, and the constant technological innovations that are constantly emerging). Just investing in IT does not guarantee that other organizations' expected benefits or results will be confirmed, or that your gains will be immediate (Lunardi *et al*, 2010).

One interesting perspective to notice is that although larger companies are important, not all SME organizations are relegated to less important ones. For example, the so-called Hervas (2020) “process-oriented innovators”, include the firms that primarily undertake process-oriented activities and develop process-oriented technology and innovative routines, because of their business models, position in the supply chain, or hierarchical interdependence with larger firms or product innovators. For this reason, as a result, their process innovation is linked to embodied technology, and adoption is differentiated (Hervas, 2020)

The SME company network context provides an opportunity for SMEs to go after innovation. According to Brink (2016) the importance of enabling SMEs for innovation and growth, besides calling for pursuing the potential underdeveloped issues like enhanced understanding of connections to directly support innovations aims at the role of process innovation in growth, as measured by increased turnover. Managers, on the one hand, must maximize enterprise performance by engaging in open innovation that better fits their internal capabilities (Hervas, 2020).

Thus, to answer **Q1:** ***why should knowledge management practices be considered for SaaS adoption by SMEs?*** We can start by responding that despite the larger companies being a high interest of the industry for adoption of products, in last years, different

hardware and software companies have seen SME as a new and attractive market segment, being the focus of numerous IT suppliers. (Lunardi *et al*, 2010).

According to (Malladi *et al*., 2012) SaaS can in fact be associated with IT-enabled innovation and firms are leveraging SaaS to create business advantage. In fact, it can be benefic when involving more cooperative work and support for better decisions (Kraemer & King, 1986)

However, Lunardi, *et al*. (2010) indicated that motivation for applying this approach would be classified into different factors: internal needs, external pressures, perceived usefulness, and the presence of a suitable organizational environment. It is important to mention that "external pressures" and "organizational environment" seem to be the main motivators for SME companies, especially due to the demands of the business and the great competition that exists.

When the company properly plans its IT investments, the benefits of this technology on the organization's organizational performance are more easily perceived - the identification of perceived usefulness and the presence of a suitable organizational environment being its main predictors (Lunardi, 2010). Malladi, S., and Krishnan, M. (2012) found that complementarities like organizational learning, IT architecture flexibility and process management maturity enhance the value further, showing the business value of SaaS in general and the potential for innovation-related benefits in particular.

Also, despite SMEs' limitations such as scarcity of material, financial, technological, human, and productive resources, the effort, and dedication of entrepreneurs collaborating can improve companies' performance (Dias *et al*., 2020). Considering cooperation and planning for adoption, performance, and enhancing the knowledge process of creation, acquisition, maintenance, systematization, and sharing of information this context can positively moderate SaaS adoption.

3. Integrating KM literature to SaaS Adoption in SMEs for increasing organizational performance.

Knowledge management has a positive effect on increasing organizational performance (Sapta *et al*., 2021). With the organizational performance we mean, in most general words, the term proposed by Abubakar: to work on organizational measurable objectives, typically associated but not limited by financial benefits, profitability, and organizational learning (Abubakar, 2014). For their survival, growth, and innovation from the organizational performance perspective managing knowledge through networks is crucial, as this leads to value generation and success (Brink, 2016).

Knowledge management practices and organizational learning are significant factors to achieve better performance in a rapidly changing business (Kordab *et al*, 2020).

Then it is important to consider the identification of the level of maturity in knowledge management as an important indicator of the competitiveness potential of the organization (Lotti, 2019).

From the competitiveness approaches, some perspectives can be defined to answer the second question of this article **Q2: *How do these practices contribute to a more sustainable organization performance?*** A first perspective would be to consider that agile organizational management can manage knowledge well to produce quality knowledge. Organizational sustainability cannot be separated from organizational culture, as organizational culture is the main attribute to improve performance (Sapta *et al*., 2021).

Also, an organization with a sustainable or long-term reputation can attract talented and creative employees who can contribute to creativity and innovation, being relevant to mention that management support has a positive and significant relationship with organizational performance (Hossin *et al*, 2021, M. 2021). With the previous context, we consider:

KM-practices can positively moderate technological adoption of Software-as-a-Service (SaaS) solutions on Small and Medium-sized companies to contribute for a more sustainable organization performance

Working organizational behavior dynamically with KM-Practices, as discussed previously can lead to innovation from a SaaS perspective. Adoption of SaaS should impact the competitive advantage of SMEs (See fig. 1).

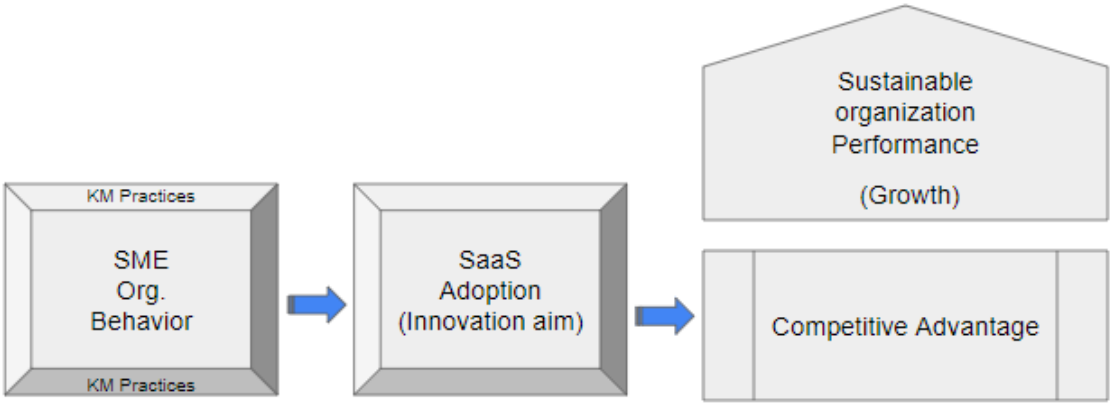

Fig 1. SME (Organizational behavior) -> KM practices moderating in a positive way innovation aim (SaaS adoption) for a sustainable org. performance. Adapted from: Brinks (2016)

Organizational learning involves a set of knowledge management processes that facilitate the acquisition, creation, storage, sharing, and application of knowledge

between individuals and groups at all organizational levels (Kordab *et al*, 2020) however individual preferences are going to shape and have an impact on creativity and innovation (Brink, 2016). Several benefits can be achieved both through incremental improvements in efficiency and radical organizational methods (Parida, 2020). One of these benefits is a successful adoption of Cloud computing, particularly SaaS solutions. Being worked as an innovation Aim, it will lead to achieving the organization's knowledge strategy and would create value between the organization and customers and improve sustainable organizational performance.

Conclusion and final considerations

This exploratory paper indicates that knowledge management in small businesses (SME) could positively moderate the adoption of cloud computing solutions such as SaaS with the goal of stimulating an increasing organizational performance. Additionally, cloud adoption can facilitate Knowledge management from several perspectives, like cooperative work and better decision-making. This study suggests that deeper research is needed to clarify the validity of that hypothesis and indicates that it is worth focusing on future research in this direction.

Despite the economic, political, and social relevance of SMEs, the perspective of SMEs' performance (including financial and marketing results, efficiency and effectiveness, innovation, and competitiveness) is still to be explored, especially in emerging economies.

Practices associated with Knowledge management along with their barriers are important management needs to add real value to products and services, so companies can become more competitive. Also, organizations are gaining more experience in diversified solutions including the cloud and they start to shift more core business functions and improvements on their efficiency.

This paper aimed to identify, analyze, and describe, from a knowledge management approach if these practices can positively moderate the technological adoption of Software-as-a-Service (SaaS) solutions in Small and Medium-sized companies for sustainable performance. It developed a literature review on KM, SME, SaaS, and sustainable topics, linking them to answer why should knowledge management practices be considered for SaaS adoption by SMEs and how can these practices contribute to more sustainable organizational performance.

To the first question, it was highlighted that KM practices should be considered for SaaS adoption by SMEs to moderate their competitive advantage, stimulate innovation and respond to internal needs, external pressures, perceived utility, and better organization. There are also vendor companies more interested in this market. To the second question, the answer is determined by the quality of the knowledge management, and the attraction of talent that would also impact positively on innovation and organizational performance, by stimulating the creation, acquisition, sharing, storage, and application of strategies associated with the sustainability of the company.

Most of the analyzed articles are based on US and European contexts, traditionally considered as developed economies and innovative, however, we could not find relevant articles with information or comparison in other geographies including developing countries which could generate other results.

Further studies should investigate the findings of this current paper through qualitative (e.g., case study) and/or qualitative (e.g. survey) research.

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