

# ERP Implementation Lifecycle in SMEs – A Review

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**Abstract:**

**S**aturation is visible in ERP implementation in large enterprises but has huge potential in SMEs. With SMEs impacting large portion of economy, the focus has shifted to globalization, building partnerships, developing value networks, and managing the huge information flow across and within SMEs nowadays. Due to rising business demands, SMEs are adopting ERP systems and the vendors now focus more on implementing ERP in SMEs for effective information management. The current study summarizes research on enterprise resource planning (ERP) systems implementation within the domain of small and medium-size enterprises (SMEs). The SMEs suffer from resource poverty which increases the risk of ERP adoption. SMEs are structured very distinctively compared to LEs, thus the ERP implementation model, practices, and methodologies are different from LEs and should be perceived differently. The main purpose of this article is to observe the areas that lack sufficient research within the ERP in SMEs domain, appraise with current research findings that could felicitate practitioners, suppliers, and SMEs while implementing ERP in SMEs, and suggest research avenues for future. Moreover, this study signifies the current practices in SMEs, the impelling theories, and adaptive frameworks that are discussed in existing literature on ERP implementation in SMEs.

**Keywords:** ERP, SMEs, ERP adoption, Literature Review.

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## I. INTRODUCTION

ERP systems have been a subject of keen interest in both academia and practice and have recently gained a substantial attention for its adoption in SMEs. There are numerous articles on ERP system implementation that had been published in recent times exploring implementation techniques, issues in ERP implementation, and benefits it brings to an organization. Moreover, a number of ERP literature reviews have been conducted [1, 2-4] which provides general perspectives on ERP implementation. Since ERP is a broad topic, the current study focuses on ERP implementation and adoption in SMEs which will provide a more detailed analysis and deeper understanding of this domain.

The orientation of SMEs, including culture and environment, is different from large organizations (87,5). The prime reason for this difference is the organization size which also plays a crucial role in ERP implementation [6, 7]. The literature projection indicates that there is invariably less focus on the study about ERP in SMEs whereas the larger volume of literature talks about ERP implementation in larger organizations [8, 9] and the implementation models cannot be replicated to organizations smaller in size.

The objective of this paper is to build a thought around ERP implementation techniques in SMEs and presents a comprehensive review on the same. The study details on the status of research in this area and pin down the gaps in available research that could assist the researchers and practitioners. As a basis for reviewing the articles on implementation lifecycle, the ERP implementation life cycle model prescribed by Esteves et al. [10] was taken as standard based on which a total of 89 articles were reviewed.

The current study is organized as follows. The research methodology is presented in Section 2 followed by Section 3 which provides an overview of reviewed articles. The outcomes of the study are detailed in Section 4. Section 5 discusses the observations and recommendations for future research whereas the implications on research and practices are specified in section 6.

## II. RESEARCH METHODOLOGY

Literature reviews represent a well-established method for accumulating existing knowledge within a domain of interest. Current article adopts systematic review approach that includes explicit procedures and conditions to minimize bias[11].

The review covers articles that are published in peer reviewed journals or conference proceedings. The articles were picked up from Google Scholar, EBSCOhost, and Web of Science Databases using the keywords: ERP, Enterprise Resource Planning, SMEs, Small and Medium Enterprises, and their combination. In addition, the top IS journals such as MISZ, ISR, CACM, JMIS, and ISJ were searched using the previously mentioned keywords in published issues. The article’s abstracts were checked for relevancy and adequacy of the content and the articles which addressed ERP in SMEs were selected.

Numerous ERP lifecycle models were proposed by various research articles [10, 13, 14, 15], but the study adopted the six step framework (Esteves et al.[10]) to ardently organize the review. The framework has more detailed approach compared to other models especially by extricating system adoption and system acquisition which otherwise are specified as unified steps. Likewise, the chosen framework splits system evolution and retirement. Thus it is able to provide more detailed understanding of the ERP life-cycle and thus better classification of the articles. The selected framework comprises of adoption decision, acquisition, implementation, use and maintenance, evolution, and retirement phases. Also, the framework had been previously used by other researchers while reviewing ERP literature [3, 16] which enables the study to compare the findings with formal literature reviews.

## III. ARTICLE OVERVIEW

A total of 89 articles were reviewed. Figure 1 classifies the articles based on adopted research methods among the articles. Surveys and Case studies were primarily used in the reviewed articles.

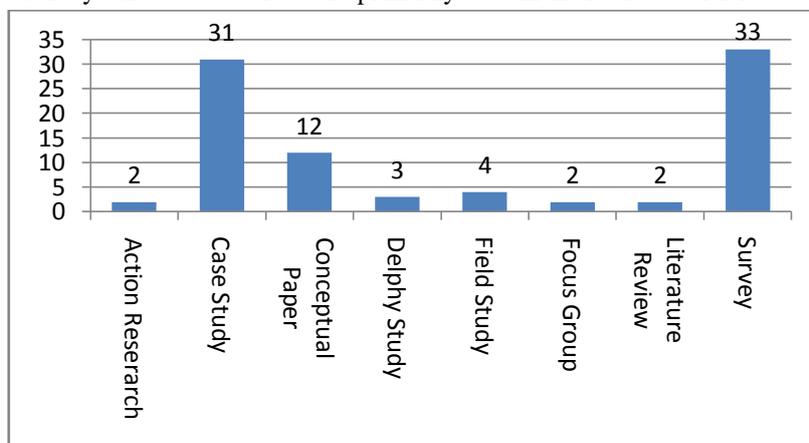


Figure 1: Article classification based on Research Methods

As shown in Figure 2, the implementation phase in ERP lifecycle stands out to be the prominently discussed phase. The observation aligns with formal literature reviews on ERP system[3, 16] which opine the same.

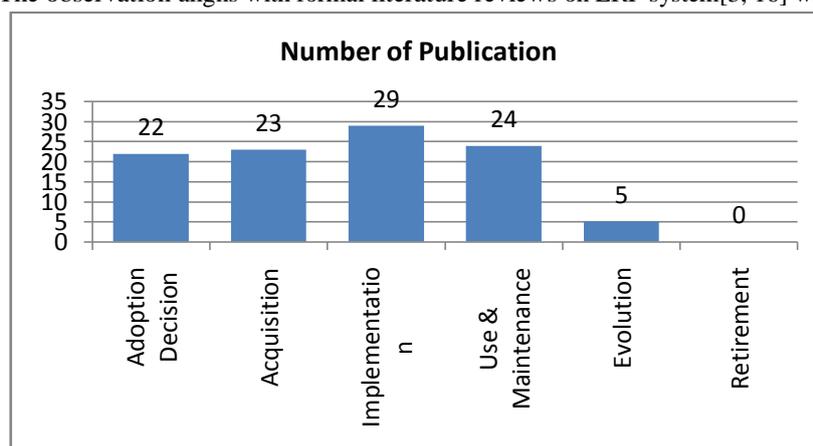


Figure 2: Discussed phases of ERP Lifecycle.

In addition, Table 1 endows various frameworks and theories used in previous studies and list articles that explicitly mentioned these theories and framework.

Table 1 Adopted Theories And Frameworks

<b><i>Theory / Framework</i></b>	<b><i>Reference Articles</i></b>
Dialectic Perspective	60, 81
Process Theory	9, 14
Technology – Organization Environment Framework	20, 21
IT Conversion Theory	89
Punctuated Equilibrium Theory	66
Social Process Theory	66
Grounded Theory	14, 61, 62
Innovation Diffusion Theory	33, 51
Organizational Change Theory	33
Neo-Institutional Theory	33
Complexity Theory	33

#### IV. DISCUSSION & FINDINGS

The articles referring various phases of ERP implementation lifecycle are categorized in Table 2 given below:

Table 2 Article Categorization

<b><i>ERP Lifecycle Phase</i></b>	<b><i>Subject Matter</i></b>	<b><i>Reference Articles</i></b>
Adoption Decision	Adoption Drivers	6,7,17-26
	Adoption Evaluation	17,22,24-31
	Organizational Characteristics	6,7,22,24,26,31,32
Acquisition	Adoption Issues	8,14,28,33-35
	Factors Affecting Selection	18,19,36-41
	Selection Criteria	29,38,39,42-44
Implementation	In-House Developed System	45-47
	Acquisition Issues	8,14,33,42,47-52
	CSFs	9,40,41,49,53-57
Use and Maintenance	SMEs Characteristics	6,50,53,57-60
	Impact of Consultant	58,61,62
	Implementation issues	6,8,14,40,62,64-69,81
Evolution	Benefits	6,40,41,70-77
	Use	6,14,48,50,63,77-81,85
	ERP impact	36,37,82-84
Retirement	-	-

##### ***A. Adoption Decision***

In this phase, organizations perform need analysis to ascertain their technical and business needs for adoption of ERP. Numerous factors influence the adoption of ERP in SMEs as suggested by reviewed literature.

Adoption drivers - The adoption drivers are discussed in the literature from several perspectives. A model based on TOE framework was applied to predict the factors that influence the willingness of SMEs to

adopt IS [20,21]. Internal organizational culture and technological factors impacts the IS adoption in SMEs more than industry and market related factors [20,21] where as it was observed that environmental factors influence the IS adoption since SMEs operating in collaborative environment tend to adopt IS [23].

Adoption evaluation – The willingness of management and CEO's alacrity are one of the prominent influencing factors in adoption of ERP in SMEs [25]. The perceived benefit and cost are important impelling ERP adoption factors [17]. Also, the business factors such as competition, survival, meeting the expectation of stakeholders, and retention of customers intensify SMEs for ERP adoption [29]. A pre-adoption framework was developed to evaluate the suitability of ERP adoption by aligning the business complexity with the change requirement [30]. [27] proposed a decision support methodology for assisting the decision makers to adjudge the outcomes of ERP adoption project.

Organizational characteristics – The reviewed literature signified that the organizational characteristics and culture influence the adoption of ERP in SMEs. Though business complexity of SMEs does not have vital impact on ERP adoption [7], the size of organization a strong adoption predictor [6, 7, 22, 26]. Additionally, industry type of SMEs stimulates its willingness to adopt ERP [22, 31]. The literature suggests that adoption driver varies as per the size of SMEs [32]. Also, less impact of financial scarcity and the difficulty in selecting ERP for SMEs does not influence the ERP adoption decisions [24].

Adoption issues – The literature addressed various other issues faced by SMEs in adoption of ERP. Though SMEs may have formalized management techniques, but risk minimization is not guaranteed [33]. Also, success and failure of ERP implementation is proportional to project management activities [8]. [34,35] conceptualized a multi-disciplinary Customer-Centric ERP Implementation (C-CEI) method that could facilitate SMEs in choosing suitable ERP system by mapping their requirements and reducing misalignment of ERP with organization. Also, to overcome the failure in adoption, ERP vendor's effective collaboration with SMEs regulate ERP adoption success in SMEs.

## **B. Acquisition**

This phase includes the process of ERP package and vendor selection that best fit the organization requirements.

Factors affecting selection - In order to better understand and evaluate the acquisition and selection process, many studies identified the factors that affect ERP selection in SMEs, and proposed criteria to optimize the selection process. Results show that internal organizational factors like business complexity, change management, and external factors like supply chain partners, and the pressure of value networks affects the ERP selection process in Greek SMEs[36-38]. While other research conducted in Australian SMEs, suggest that cost drivers, functional requirements, flexibility, and scalability of the ERP system[41], and the degree of ERP alignment/fit with the business processes[40] have a great influence on acquisition decisions. Moreover, in[18, 19], they compared Finnish small, medium, and large enterprises. They explored the relationship of enterprise size with the ERP selection process. Their results show that small companies appear to have problems with the ample information for decision-making, and sufficiency of participation from different organizational functions in the ERP system selection phase.

Selection criteria - This part presents research that developed or explored the criteria that SMEs use in order to select their ERP systems. In[44], they stated that the ERP fit with organization business processes appeared to be the most important selection criterion in Nordic European SMEs, whilst others developed criteria that can aid SMEs in the selection process. The dimensions were local support, affordability, suppliers' business domain knowledge[29], or a methodology for selecting the best-fit ERP system with make-to-order (MTO) SMEs' environments[39].

In-house developed systems - In ERP for SMEs literature, few research papers questioned the feasibility of in-house developed systems over off-the-shelf ERPs as in[45, 46]. These papers argue that standard ERP packages could compel rigid structures and inflexibility on niche SMEs, and in-house developed systems might be more suitable in some cases. Correspondingly, [47] conducted a case study and reported that in some cases, ERP offshore outsourcing could be more feasible and beneficial for SMEs.

Other acquisition issues - C.E.Os.' technology awareness, employees' IT competence, firm size, ERP compatibility[49, 51], and project management[8], are among the CSF for selecting the right ERP for SMEs. Other researchers furnished recommendations and methods that could be of assistance in managing and

minimizing the key risk factors during the ERP selection process[33, 48]. Other studies went further and conducted a comparative analysis of the impact of size on the selection procedures in LEs and SMEs[42, 52], as well as, across industrial sectors in Taiwan[50] .

### ***C. Implementation***

This phase includes the actual ERP installation, customization, business process re-engineering (BPR), and all other activities that align the system with the organization requirements. The ERP implementation phase is very critical, as well as, the most resource consuming phase. Several studies focused on different corners during the implementation process.

Critical success factors - The adequacy of general-ERP implementations CSF in relation to Belgian SMEs-specific characteristics were examined in[53]. The study discovered that most of ERP CSF apply to SMEs with some exceptions. Likewise, a study analysed implementation success factors in small size firms and concluded that the CSF in literature are adequate when applied on small organizations[49]. Another article presented an analysis of the CSF related to Chinese SMEs' characteristics[57]. While top management support, ERP system quality, and knowledge sharing during implementations, were found key CSF in Thai SMEs[54], however, BPR was found to be a key factor of success[57].

In[56], the authors developed a framework for ERP implementation CSF assessment in s small manufacturing firms. Moreover, [9] used the Process Theory in order to identify the implementation critical elements through case studies in the UK. The study concluded that critical success factors, critical people and critical uncertainties contribute to the success or failure of ERP implementations in SMEs. [40] & [41] carried out an analysis to determine the key success and failure factors of ERP implementations in Australian SMEs. Further, [55] presented a detailed case analysis of successful and unsuccessful implementations in five Canadian SMEs. Finally, a new CSF ranking that would be more adequate to SMEs environments is needed[57] .

SME characteristics - As organization-specific characteristics and contexts have been always important research aspects, they attracted researchers to investigate their implications on the ERP implementation process. A study presented a conceptual model that could help implementers, vendors, and consultants implementing SAP R/3 ERP to better understand the system expectations by SMEs in certain contexts or regions [59]. Since organization size and business complexity affect ERP implementations, it was reported that implementations in Irish SMEs are usually easier and shorter in duration than those reported in ERP literature[58]. In[60], through adopting a vendor's perspective, they recommend that ERP systems need to be localized according to the local management features. SMEs' characteristics and culture play an important role in the success or failure of ERP implementations in Belgian SMEs[53], while cultural issues did not play a major role in ERP implementations within Chinese SMEs[57]. Moreover, ERP implementation methodologies differ between different organization sizes and business complexities, as LEs are more reluctant to adopt a Big-Bang approach than SMEs[6]. Further, a comparative analysis on ERP implementation rates and success, between different organization sizes and industrial sectors in Taiwan shows that ERP implementations in electronic and science industry SMEs are usually more successful than those in traditional industry[50]

Impact of consultants - Although experienced consultants can play an important role in correcting their client companies' "unrealistic expectations" of ERP implementations[58]; however, a study in Taiwan shows that consultants could still face resistance from SMEs' managers[58]. On the contrary, through Grounded Theory approach,[62] states that in implementation of SME-specific ERP system, they will not need external consultancy, which will decrease their investments dramatically. Moreover, SMEs will save time and high costs of training, which are usually, associated with standard ERP packages.

Risk management - Few papers discussed risk management during ERP implementations in SMEs. In[63], they portrayed how SMEs should deem and manage the risks in their ERP implementation projects. [33] discussed methods for ERP implementation risk management and minimization in manufacturing SMEs. Iskanius[48] applied and advocated for using the risk analysis method(RAM), to identify and asses the critical risks of the ERP implementations, and to apply the characteristics analysis method (CAM) in order to help SMEs in dividing ERP implementation projects into sub-projects.

Other implementation issues - Project activities, coordination, and project sponsors[8], employee behaviour, individual characteristics of ERP project management's team, and organization culture have a great effect on the success of ERP implementations in SMEs[64].

[67] emphasized the importance of knowledge capturing and management during implementations in SMEs. The study identified the essential knowledge required for ERP implementations, and proposed a framework to manage it, through matching the required knowledge with the ERP capabilities and features. Moreover, [69] proposed the application of the FAST (Framework for Application of Systems Thinking) system development methodology while implementing ERP systems in cigarette manufacturing SMEs. The study concludes that using such an agile method could assist in reducing and filtering common problems that occur during ERP implementations.

[66] conducted a study on two Chinese small and medium companies. Through business process modelling, the study compares and analyses the process of ERP implementation in these two companies, and discusses their decisions concerning business process re-engineering. Likewise, [68] emphasized the importance of business process modelling, management and re-engineering ex ante implementations. Their study was a simulation on niche Italian SMEs. They conclude that in some cases, ERP systems should be customized to fit with niche SMEs and not vice versa, as they might lose their competitive advantage by complying with standard ERP processes.

In comparison with LEs, SMEs suffer scarcity of financial resources; however, only two papers have discussed ERP costs in an SME context. Through a survey analysis, Equey et al.[65] investigated and evaluated the costs that occurred during ERP implementations in several Swiss SMEs. They found that size, consultants' experience, and people characteristics have a great influence on ERP projects costs. Moreover, implementations at larger companies generally cost much more than at smaller companies, however, a survey by Mabert et al.[6] shows that cost of ERP software at SMEs is higher as a percentage of overall cost than at LEs.

#### ***D. Use and Maintenance***

After the sizeable efforts and investments in ERP implementations, companies start to use the systems. Many issues emerge after the systems' "go-live", like system acceptance, user satisfaction, benefits realization, system utilization, and maintenance.

Benefits - ERP benefits expectations and realization have always been problematic issues for the majority of companies. The difficulty originates to several reasons. Here we present some of the issues discussed in literature. Although benefits realized could differ in each SME industry[41], or organization size[6], several studies argue that realizing benefits from ERP systems cannot be done unless there has been an ex-ante efforts to define and audit these expected benefits[41, 70-72, 75]. However, if SMEs make the right choices in the ERP selection phase, some benefits from ERP systems could be self-evident[41, 73, 74] and tangible[40]. Moreover, a study in Swiss SMEs concludes that the benefits realized from ERP systems exceed their costs[76]. Whilst another study reports that benefits realized from ERP systems are higher in LEs than SMEs[77].

Use - Even if the ERP implementation was successful, for many practitioners and researchers, the usage of the systems is considered the moment of truth of an ERP system. If the implementation was successful but the system was not used or "accepted" by users, then it is considered a failure. Thus, many studies were focused on use, user motivation and satisfaction related issues.

Adopting ERP's standard best practices is the aim of many SMEs, as they see it as a gateway for standardization and regional or international markets. However, through a dialectic perspective, Nathanael et al.[81] argue that best practices, when imposed on SMEs, might affect the motivation of the users, and lead to the loss of the know-how and the competitive edge of these companies. Moreover, if ERP systems were more agile and responsive, this would utilize the system use and offer a competitive edge for MTO and traditional manufacturing SMEs[78-80]. A case study results show that user satisfaction and system acceptance rates in LEs are higher than those of SMEs[77]. Further, Wu et al.[50] argue that user satisfaction in Taiwanese electronic and science industries' SMEs is higher than of LEs in the same industry and SMEs in other industrial sectors. In order to minimize the risk of challenges related to user acceptance and motivation, Huin[85] developed a multi-agent model that can decrease the risks related to system use and user acceptance, through organizing the ERP project management activities. In addition, enhancing user communication, training, and obtaining short-term successes could positively impact the motivation and users' system acceptance rates within SMEs[48]. In[63], they state that risk management is a continuous process. They also recommend that benefits and risks in the use and maintenance phase should be re-assessed once or twice a year, in order to manage the impact of stirring risks, and to govern system usage and avoid slipping into old procedures

ERP impact - Introductions of new information systems in companies are accompanied by changes with their business processes, structure, and communications within those companies. Likewise, ERP systems affect many corners within organizations. A case study in an MTO medium-sized company reports that, the ERP adoption had a positive impact on visibility, quality, and control of information, which in turn enhanced the decision making process[84]. Using the Six Imperatives framework, Argyropoulou et al.[36, 37] evaluated the impact of ERP systems on Greek SMEs' business performance. In[82], they attest that ERPs impact on productivity is moderated by SMEs size. Another study[83] adopted an organizational cross-functional point of view in order to evaluate the impact of ERP implementation on different business functions. The study concludes the smaller the size of the organization, the more it will benefit from the ERP system's cross-functionality capabilities.

#### ***E. Evolution***

This phase involves the extension of ERP systems through integrating other systems or applications, such as customer relationship managements, supply chain management, and advanced planning and scheduling systems.

In[86], the authors state that SMEs which had successful ERP system implementations, are now investigating means of how to extend it in order to support their external operations. The study concludes that, with the use of Internet, ERPs can be extended to cover SMEs' entire supply chain, which in turn will enhance their external operations and relationships. Another study developed an ontology-based conceptual framework. The study argues that, representing the implementation processes using ontology domains, classes, and relations could enhance the coordination and project management during ERP implementations in SMEs[89]. Further, Metaxiotis[88] carried out a study to investigate the *raison d'être* for integrating knowledge management (KM) systems and ERP systems in SMEs. The study suggested an ERP extension and KM integration frame work.

#### ***F. Retirement***

Retirement phase corresponds to the stage when an ERP system is substituted by another information system. No articles were identified in this phase.

### **V. FUTURE RESEARCH AVENUES**

This paper contributes to both research and practice through providing a comprehensive literature review of ERP in SMEs. For practice, the paper sheds the light on past and recent issues, challenges, and success stories that can guide consultants, vendors, and clients in their future projects. For research, the organization of literature in ERP-lifecycle phases can aid them in identifying the topics, findings, research methods, theories, and gaps discussed in each phase of interest.

The reviewed articles are spread across 44 various outlets. Among the outlets, we have recognized only one special journal issue in JEIM focusing on adoption of ICT by SMEs, which included several ERP related research papers. As the research interest on ERP in SMEs is increasing, research outlets should pay more attention to this domain.

In general, 89 articles across 10 years period is relatively a low number of publications. Despite the need for research on ERP in SMEs was recognized in previous literature, still the amount of research conducted on this issue is limited. Thus, more research needs to be carried out in order to gather sufficient knowledge about this phenomenon, as SMEs did not receive appropriate attention in comparison with ERP in LEs.

Based on our ERP in SMEs literature review, in the following part we present some research gaps and suggestions organized according to life-cycle phases:

**Adoption** - In IS literature in general, and in ERP literature in specific, the term "adoption" is variably perceived by authors. Some authors perceive it as a final stage in which users accept the ERP system, and others define it as the preliminary stage when companies decide on investing in an ERP system. Although some papers tackled the pressures or motivations imposed by suppliers and partners for ERP adoptions by SMEs, still there is a gap in studying national government policies, rules and laws and their consequences on ERP adoptions in SMEs.

**Acquisition** - The current literature lacks focus on new technologies (e.g. Software as a Service-SaaS) and their implications on ERP projects. Moreover, ex-ante cost estimation, financial feasibility, and investment

evaluation studies of ERP projects have not been identified in our review of literature. Furthermore, literature lacks cases that compare between SMEs'-specific ERP and general ERP systems, as well as, industry-specific ERP packages vs. general ERP ones.

Implementation - Some articles examined ERP projects' success and CSF in SMEs; however, there was no clear definition for success. Moreover, the differences of ERP implementation methodologies and their impact on ERP projects had scant attention.

Use and maintenance - Interface language and ERP localization and their effect on user satisfaction are rarely discussed in literature. In addition, post implementation audit strategies and ex-post investment and financial evaluations were not discussed in literature.

Evolution and retirement - Regarding the ERP life-cycle phases, the first four phases were noticeably captured in literature. As recently SMEs started to adopt ERP systems to enhance their operations, value networks, and expansion goals. Thus, it is not surprising to find very few papers discussing ERP evolution, as ERP systems require time to mature enough and recompense in order to convince organizations to extend them further. We were not able to find any article that directly addresses the retirement phase. Thus, we recommend more focus on the evolution and retirement phases, as they can shed the light on the motivations for extending or replacing ERP systems.

General comments - Although comparisons between SMEs and LEs cases were found in literature, yet the size differences among SMEs were seldom discussed, and they could provide valuable research insights. In relation to type of organizations, the cases studied were often conducted in traditional manufacturing SMEs. Only few articles elaborated on the manufacturing context or type of industry, however, difference in production strategies or industries could produce different research findings. Besides the SME type and context, another important observation evolved from our review, which is the "SMEs" perception. Some studies delimitate SMEs differently. Some researches define an SME in a qualitative manner [28], while the majority of them define SME in terms of number of employees, annual revenue, or their combination. However these numbers differ as well, particularly depending on the geographical location of the study. Adopting the European Union's definition, most studies define SMEs as organizations with less than 250 employees. Interestingly, some researchers have applied a more granular approach distinguishing between subgroups (e.g. small, micro) within SMEs [16, 18, 19]. Both, type of investigated organizations and SME definitions are likely to influence the research findings. Therefore, researchers need to be cautious about these issues and elaborate on specificity of each particular environment.

While there were many studies with a national perspective, however, we were not able to find any cross-national studies. This kind of comparison might be fruitful for ERP literature in SMEs. Also, most of the studies were embarked in America, Australia, Europe or Asia. It would be prolific to have some studies on African or Middle Eastern SMEs as well.

Surveys and questionnaires can be quantitative or qualitative in nature. Although surveys were highly used, it's identified that 53% of the research publications have adopted a qualitative research approach. As many publications have reported that they conducted surveys, still they reported and analysed them qualitatively, and only 25% of the publications have used a quantitative approach. According to Eisenhardt[90], multiple data collection methods could strengthen theory grounding and theory building through evidence triangulation. Thus, 22% of the studies have adopted mixed research approaches, through combining both qualitative and quantitative approaches and data collection methods. Most often a combination of case studies and surveys was employed. Qualitative studies can provide rich explanations and explorations to emerging phenomena; however, we call for a focus and use of other research approaches, as they can provide different angles of data interpretation. Moreover, use of theories in ERP literature in SMEs is very limited, as only 15% of the papers have adopted a theoretical lens. This could be attributed to many reasons, among which, the complexity of finding relevant theories that could explain certain technical issues for example. Still, we call for more theory use, theorizing, and reporting on the difficulty of adopting theoretical lenses if any.

As revealed in the literature review, only two Action Research (AR) papers were identified, however, we think that AR and similar engaged methods could provide very valuable hands-on experiences for ERP in SMEs literature and practice.

There is also a need for more papers on Open Source (OS) ERP systems, and comparative studies of OS ERP vs. proprietary ERP systems. While SMEs usually have limited resources, and costs and benefits from ERP implementations continue to be an issue, more research needs to address these topics.

Finally, existing literature have usually adopted as ones idea perspective in data collection (e.g. customer side), while other perspectives could enhance the understanding of certain phenomena. Finally, it could be beneficial if research provides some reports on ERP failure cases, which might assist stakeholders in avoiding previous pitfalls.

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