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Enterprise Systems Implementation and their Impact on Employee Job Outcomes. A review of the literature, synthesis, and framework

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A review of the literature, synthesis, and framework

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Abstract. Enterprise Systems (ESs) integrate business processes to enhance organizational effectiveness. Organizations make huge investments in procuring and implementing ESs to effectively manage their resources to achieve strategic decision-making and improve operational excellence. Irrespective of the investments, it has become increasingly difficult to reap the full benefits of the systems being implemented. ESs implementation is a massive change event in organizations and in employees' work routines that affect their day-to-day business activities impacting their job outcomes. To this end, the primary aim of this systematic literature review (SLR) is to synthesize the prior literature that explored the association between ESs implementation and employee job outcomes. Accordingly, our review study systematically analysed fifty empirical studies to identify themes that received substantial attention in the prior literature. The SLR uncovered key gaps, unearthed six themes, identified potential research areas, and proposed a comprehensive framework depicting the current research profile and potential avenues linking ESs and employee job outcomes. Our review provides significant implications for practice and research through the proposed comprehensive framework. We further suggest that ESs implementors need to consider job outcomes as crucial parameters during and post-implementation as successful implementation provides a strategic advantage to organizations and benefits employees.

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1 Introduction

Enterprise systems (ESs) have been defined as "*comprehensive, packaged software solutions [that] seek to integrate the complete range of a business' processes and functions in order to present a holistic view of the business from a single information and IT architecture*" (Lee & Myers, 2004, p. 357). Implementation[1] of ESs integrates the business processes that have the potential to enhance organizational effectiveness and competitiveness (Li & Zhao, 2006). But the ESs inherently becomes more complex, post processes integration (Klaus et al., 2000) that requires employees to adapt quickly which otherwise may lead to prolonged implementation periods, a rise in costs etc. Subsequently, other factors such as the lack of appropriate fit between organizational culture and ESs being implemented (Strong & Volkoff, 2010), resistance to implementation (Kim & Kankanhalli, 2009), and failure to cope with business process changes (Beaudry & Pinsonneault, 2005) attribute to implementation failures. Although ESs offer seamless integration of information flow both across the organization (Kim, 2000) and inter-organizations (McLaren et al., 2002), it has been observed that the implementations led to non-adoption (Plaza & Rohlf, 2008), lower job satisfaction, and lower job performance which further led to higher employee turnover (Sykes et al., 2014). These factors led to high failure rates subsequently shooting up the initial costs of implementation as well as the scope of planned projects (Panorama Consulting, 2022).

A myriad of factors and characteristics have been investigated in the prior literature that impact employee job outcomes in the organizational behaviour literature. Traditionally, most social science research explanations for job outcomes have been determined by the characteristics of organizational contexts, groups, individuals, and technological environments, among other reasons (Sykes et al., 2014). For example, Hunter and Thatcher (2007) examined the impact of job stress, organizational commitment, and job experience on job performance. Gilboa et al. (2008) investigated the effect of work-related stressors on job performance. Janssen et al. (2010) investigated how employees' perceptions of justice had impacted emotional exhaustion and job performance. Several studies in the IS literature have demonstrated that the phenomenon of technology adaptation is one of the most important determinants of employee job outcomes (e.g., Bala & Venkatesh, 2016). This narrative has been echoed in the prior research on ESs implementation (e.g., Morris & Venkatesh, 2010; Rai & Hornyak,

2013; Sykes et al., 2014). Furthermore, ESs implementation creates new workflows and business processes that are often challenging to comprehend, impacting employees' job outcomes. Consequentially, job satisfaction and job performance are two important job outcomes that have gained increased attention in the ESs literature in the recent past (Huy et al., 2019; Sykes & Venkatesh, 2017; Sykes, 2020).

With organizations spending billions of dollars annually on procuring and implementing a wide variety of new ESs (Panorama Consulting, 2022), that are failing to achieve desirable results further resulting in huge overheads, it is imperative to understand the possible reasons for such failures that may be associated with job outcomes. With a new ES(s) being implemented, which often starts with an off-the-shelf standard system, finding the right balance between adjusting the system to user needs and adjusting work to the new ES(s) is one of the most challenging issues. This will eventually lead to over-customization which is one of the critical failure factors of ESs implementation (Momoh et al., 2010). During the shakedown phase, immediately after the project go-live, employees look for possible workarounds, unable to comprehend the vanilla product's complexity and possible mismatch between what is required and what is provided to the business need. More often than not, situations like these may lead to two outcomes. One is over-customization of the vanilla product, creating a much more complex system which would demand more effort from employees. Two, the mismatch between what is given and what is required for employees would create dissonance in their work. Though un-intended, these outcomes often result in resistance, non-adoption, work withdrawal, and turnover intention leading to system abandonment and implementation failures. Most research on ESs, during the earlier years of the past two decades, has ignored the role played by employees, as end-users, in ESs' success/failure. This can be substantiated through the research on examining critical success factors since the research on ESs has begun (Ahmad & Cuenca, 2013; Finney & Corbett, 2007). Furthermore, user satisfaction and enhanced user productivity were used as proxies in measuring ESs success (e.g., Holsapple, 2005). Considering the importance the employee job outcomes hold, we believe that it is important to explore the association between ESs and employee job outcomes. To this end, through our review study, we seek to understand and identify various research themes that investigated the association between ESs and employee job outcomes through the following three research questions (RQs):

RQ1*: What is the current state of extant literature that investigated the association between ESs and employee job outcomes?*
RQ2: *What research themes unfold from the prior literature linking ESs and employee job outcomes?*
RQ3: *What future research directions emerge from the prior literature that advances the research on employee job outcomes in the ESs context through the themes identified?*

To answer the above RQs, a systematic literature review (SLR) methodology was employed that guided us to systematically collect and analyze the studies that investigated employee job outcomes in the context of ESs implementation. The sample of studies for the review was synthesized and the summary of the results was provided in detail. Six themes emerged from our analysis of the prior literature that essentially stresses the importance of different aspects that impact employee job outcomes. Using the TCCM framework, the essential research components were analyzed and reported. Finally, a conceptual framework was developed that outlines the current research profile and provides directions for future research. The rest of the paper is organized into six sections—(2) background, (3) methodology, (4) research profiling, (5) thematic foci, (6) gaps, future research, and a comprehensive framework, and (7) discussion.

2 Background

2.1 An overview of ESs implementation

Implementation of any new Information system (IS), especially ESs, is a common change event that occurs in organizations (Sykes et al., 2014). ESs constitute Enterprise resource planning (ERP), Supply chain management (SCM), Customer relationship management (CRM), and Human resource management systems (HRM) among many other such systems (Shaw, 2000). Predominantly, any ESs comprises four components—software, process flow, customer mindset, and change management (Marnewick & Labuschagne, 2005). The enterprise software plays an important role in operational data analysis subsequently creating analytical applications that help decision-making impacting business operations on large scale (Ouiddad et al., 2018). ESs implementation requires organizations to restructure their business processes around the new system, often resulting in key organizational changes. They require huge coordination among the internal organizational processes as well as employees (Folinas et al., 2004). These systems are often technically challenging to implement owing to the

complex configuration, adaptation and data conversion from legacy systems (Osnes et al., 2018). If not managed carefully, these systems create conflict (Maguire et al., 2010), and implementation failure (Wijaya et al., 2017) leading to chaos in the organizational activities and inflicting huge losses. Proper change management strategies along with an emphasis on the customer (end-user) mindset are also crucial for ESs implementation success (Marnewick & Labuschagne, 2005). The focus of the prior literature was predominantly on critical success factors (CSFs) (e.g., Ahmad & Cuenca, 2013; Allen et al., 2002; Finney & Corbett, 2007; Hong & Kim, 2002; Kiran & Reddy, 2019), and change management strategies (e.g., Aladwani, 2001; Park, 2018) from an organizational perspective. Understanding the CSFs of ESs implementation is important from the viewpoint of all stakeholders.

To further understand the ESs literature landscape we identified twelve relevant literature review papers in the ESs context that investigated various aspects varying from critical success factors (Ngai et al., 2008) to identify various themes during implementation (Moon, 2007) to cloud ERP implementation in SMEs (Yasiukovich & Haddara, 2020). The details of these reviews are provided in appendix table A1. Though the prior research work addressed three of the four important components of ESs, much more work remains to be done to comprehend the customer (end-user) perspective and the implications of ESs implementation. Reitsma and Hilletofth (2018) conducted a study to identify CSFs from a user perspective since they are considered front-line soldiers who directly deal with the ESs for day-to-day activities. Their study's findings reveal that the composition of the project team is perceived as the most critical CSF followed by technical possibilities, strategic decision-making, education and training, and minimum customization in the top five among thirteen CSFs. Top management support was found to take the least importance which used to be one of the most important factors in the prior literature (Ahmad & Cuenca, 2013; Finney & Corbett, 2007) from an organizational perspective. Recent research has begun to examine the employee (end-user) benefits of adopting a new ES(s), such as increased performance (Sykes et al., 2014) and increased satisfaction (Morris & Venkatesh, 2010), which benefit organizations too (Uddin et al., 2019).

2.2   An overview of employee job outcomes

Organizational behaviour research devoted significant attention to employee job outcomes (e.g., Li et al., 2022; Riggle et al., 2009). With the widespread use of information technology in organizations, examining employee job outcomes has become an indispensable component of IS literature (Bala &Venkatesh, 2016) in the context of

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technology-initiated organizational change as well. However, there was no clear distinction between the various job outcomes studied. Traditionally, job outcomes for employees are classified into two categories—behavioural and psychological. While behavioural job outcomes present themselves through job performance and job tension, psychological job outcomes manifest themselves through job satisfaction, organizational commitment, and intention to leave (Singh, 1998). Additionally, there is another stream of research that categorizes job outcomes as positive and negative. The positive job outcomes constitute job performance, job satisfaction, intrinsic motivation, low absenteeism and organizational commitment and the negative job outcomes constitute emotional exhaustion, turnover intentions, and work withdrawal (Vansteenkiste et al., 2007). Using the above distinction of positive and negative job outcomes, we reviewed the prior literature to find the scope for future research on job outcomes as categorized by Vansteenkiste et al. (2007) in the ESs context. This categorization includes most of the job outcomes from both behavioural and psychological outcomes. Moreover, most of the studies found in the literature that investigated the association between ESs and job outcomes have explored either positive or negative job outcomes thus making using this categorization apt for our review.

2.3   Employee job outcomes in the context of ESs

The literature on employee job outcomes in the context of ESs implementation can be deduced into three distinct research streams. The first stream is the exploration of positive job outcomes—job performance, job satisfaction, intrinsic motivation, organizational commitment, and low absenteeism. This stream of research offers rich insights into how various antecedent factors such as job characteristics influence job performance and job satisfaction (Venkatesh & Goyal, 2022). The scope of this research stream is also extended to include other theoretical underpinnings such as the technology acceptance model (TAM) and diffusion of innovation (Bhattacharya & Wamba, 2015), expectation disconfirmation theory (Bala & Bhagwatwar, 2018), and job characteristics change model (Bala & Venkatesh, 2013). The second stream is the exploration of negative job outcomes. The introduction of a new and complex system put stress on employees to learn and use the system. This stream has investigated the antecedents and consequences of the stressors caused due to ESs implementation. System characteristics such as complexity, reliability, usefulness, and pace of change cause work stressors on employees leading to exhaustion (Maier et al., 2015). Process characteristics such as lack of process clarity could also lead to negative outcomes such as turnover intention

(Brattin et al., 2019). Studying negative outcomes is as equally important as studying positive outcomes. The third stream of research focuses on both positive and negative job outcomes. The findings from this stream offer rich insights, as the body of literature focuses on the antecedents of contextual factors that trigger both outcomes (Aliyu & Nyadzayo, 2018; Bala & Bhagwatwar, 2018).

3   Methodology

We adopted an SLR approach consistent with the extant research on literature reviews (e.g., Khan et al., 2021) to synthesize the prior literature to understand the association between ESs and employee job outcomes systematically. The use of the SLR approach is justified at least for the following three reasons. Firstly, SLRs help to elucidate the gaps in the literature thereby manifesting avenues for future research through the gaps identified (Gopalakrishnan & Ganeshkumar, 2013). Secondly, they offer comprehensive knowledge of the literature of a chosen area through organized and holistic synopsis that coheres to the standard protocols (Tandon et al., 2021). Thirdly, by following a review protocol, they ensure the reproducibility and transparency of the study (Tranfield et al., 2003). We conducted this review in three phases consistent with the protocols proposed by Dhir et al. (2020). The three phases are (1) preparation, (2) study selection, and (3) assimilation. Figure 1 presents the detailed selection process of the studies for our review.

3.1   Preparation phase

The two key steps consisted in the preparation phase are (1) framing the research objectives that help to define the scope of the review, and (2) determining the search criteria and databases which help to set the protocol of the review (Dhir et al., 2020).

Framing the research objectives (RO)

An SLR, like most research projects, starts with a meaningful research topic, objectives, or goals. Based on the guiding research questions stated in the introduction, we developed the following research objectives for analysis:
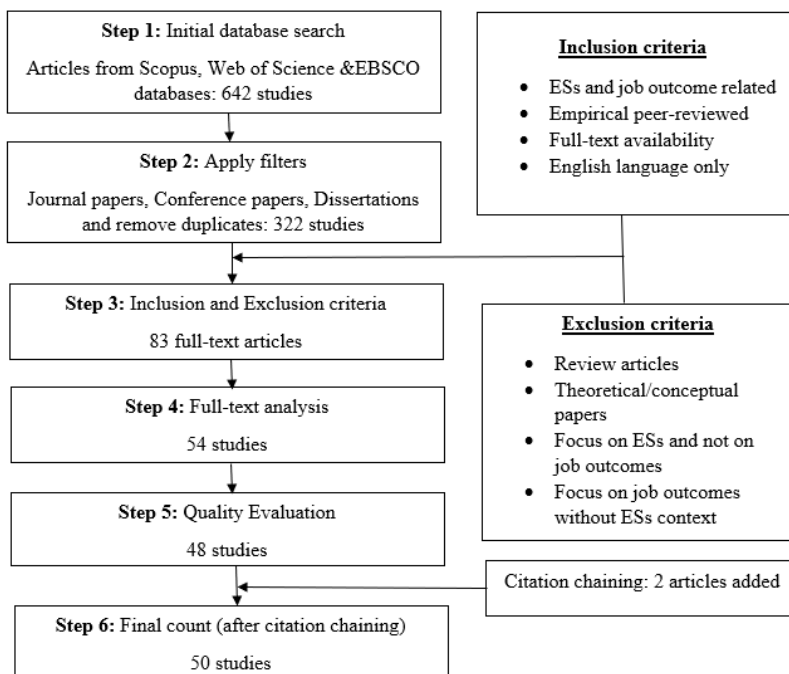
Figure 1. Sample selection process

RO1: *To explore and present the current research profile of studies that investigated the association between ESs and employee job outcomes.*

RO2: *To unearth the research themes that emerge from the prior literature and identify potential research gaps.*

RO3: *To develop a comprehensive framework that illustrates the prior research associating the ESs and employee job outcomes that help academics and practitioners to achieve a better understanding of the phenomenon.*

Determining search criteria and databases

Setting search parameters and locating adequate databases to discover relevant studies for an SLR is a difficult but necessary step for a good review (Khan et al., 2021). The primary keywords used to search for the articles were derived from past SLRs on ESs and other areas as listed in the appendix table A1 so as not to miss any synonymous words during the search process. After careful analysis of the different keywords used for the related topic of interest, we finalized the following keywords: ('Enterprise systems' OR 'Enterprise system implementation' OR 'IT systems implementation' OR

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'ERP' OR 'Enterprise Resource Planning' OR 'ERP implementation'). These keywords were combined with the set of keywords related to employee job outcomes. The following terms were used with the combination of the above keywords for the final search process: ('employee outcomes' OR 'employee job outcomes' OR 'job satisfaction' OR 'employee performance' OR 'employee satisfaction' OR 'job performance' OR 'performance' OR 'commitment' OR 'organizational commitment' OR 'low absenteeism' OR 'motivation' OR 'intrinsic motivation' OR 'turnover intention' OR 'intention to quit' OR 'exhaustion' OR 'emotional exhaustion' OR 'work withdrawal' OR 'employee positive job outcomes' OR 'employee negative job outcomes'). We chose two widely regarded databases (Scopus and Web of Science (WoS)) that have been commonly used in prior review studies to account for the maximum number of studies to be included in this review (Tandon et al., 2021). EBSCO was used as a supplementary database to ensure that no studies were missed. We examined the research studies that were peer-reviewed and published in the English language through November 2022.

3.2 Study selection

This is fundamentally one of the most important phases of an SLR because the papers chosen for analysis will define the review's outcome. This phase was divided into three parts: (1) an initial database search, (2) determining inclusion and exclusion criteria, and (3) selecting relevant papers for subsequent analysis.

Initial database search

In step 1 (as depicted in figure 1), the initial database search generated 642 studies from the three databases using the keywords mentioned in the previous section. The search was limited to the sections 'Title, Abstract, Keywords' and the language 'English.' The search yielded studies from a variety of categories, including conference papers, journal articles, book chapters, and reviews. In step 2, the search was further narrowed to include only peer-reviewed journal publications, conference papers, and dissertations, yielding a total of 436 studies. Further filtering for duplicate studies with matching titles and/or Digital Object Identifier the result generated 322 unique papers.

Determining inclusion and exclusion criteria

This stage is critical in determining which research studies should be included in our analysis. Previous SLR research has provided a few predetermined sets of inclusion and

exclusion criteria (e.g., Dhir et al., 2020), which have been modified to fit our review's scope. The inclusion criteria for the articles selected are: (i) the studies linking the association between ESs and employee job outcomes; (ii) empirical studies employing either quantitative or qualitative methodologies or both, (iii) articles whose full texts are available, and (iv) studies published only in the English language. The exclusion criteria for the articles selected are (i) literature review articles; (ii) studies that presented concepts and theory; (iii) studies focusing solely on ESs without delineating employee job outcomes; and (iv) studies focusing solely on employee job outcomes without ESs context. The rationale for including only empirical papers in the review is that they provide significant proof of concept through testing the research models. This would increase the robustness of the findings of our review.

Selecting the relevant studies

As noted in the previous section, assessing the quality of the articles, their robustness, and relevance to the present review context through this stage is a key aspect of an SLR using suitable selection criteria (Webster & Watson, 2002). At step 3, the 322 unique papers found during the initial database search were further screened by looking at their titles and abstracts along with the application of all inclusion and exclusion criteria. Only 83 papers confirm the above criteria and the full-text versions were used to further analyze them. In step 4, we examined 83 full-text articles for the research design, research questions/objectives, and data analysis techniques that fit our current review context and objectives of the review and finalized 54 papers for further evaluation.

To ensure the quality of the articles selected for the review, we carried out a final screening, at step 5, using the quality evaluation (QE) criteria mentioned in table 1. Conforming with the recent studies on SLR (e.g., Khan et al., 2021), the maximum QE score is 9 which is the maximum applicable score for any given article and the threshold value is considered as 4.5 (i.e., 50% of the maximum score). Thus, studies scoring 4.5 or above are included in the final sample of the study. Before finalizing the scores, we individually scored each study using the evaluation criteria listed in table 1 and debated and reached a consensus on any conflicts that arose. After evaluating this criterion, 6 publications with a QE score of less than 4.5 were eliminated, leaving a sample of 48 articles appropriate for our review analysis. At step 6, forward and backward citation chaining was performed to address feedback loops, which led to the discovery of three studies that fit with the goals of our SLR. These three studies could have been missed from the initial screening because of the abstractness of the words used in their titles, keywords, and abstracts. Finally, 2 publications were identified and included

QE#	Criteria	Score
QE1	Does the author(s) explicitly and adequately discuss the data analysis?	quantitative: (+2); qualitative: (+1.5); no evidence: (+0)
QE2	Does the author(s) provide an appropriate explanation of the contributions of the study outcomes and challenges to the current context?	yes: (+2); partially: (+1.5); no: (+0)
QE3	Do the outcome(s) of the study align with the utilized methodology and topic of interest?	yes: (+2); partially: (+1.5); no: (+0)
QE4	Peer recognition and source reliability (expressed as the sum of citations and the h Index of the journal)	sum >= 100: (+2); sum >= 50 and < 100: (+1.5); sum >= 1 and < 50: (+1);
QE5	Does the research method utilized in the studies commonly used in past research?	yes: (+1); no: (+0)

Table 1. Quality evaluation (QE) criteria

after evaluating them using the quality evaluation criteria, resulting in a total sample of 50 papers. The studies synthesized in our review are summarized in table A2 and their quality evaluation scores are tabulated in table A3 in the Appendix.

3.3 Assimilation

The assimilation step of the review process entails extracting information from the studies chosen for final evaluation, structuring, and logically presenting them, and analyzing the substance of the studies to satisfy the review's three research objectives (Khan et al., 2021). This phase's focus is on presenting the research profile of prior literature, synthesizing and exploring thematic foci from the studies, identifying research gaps that allow a scope to suggest future research agenda, and lastly establishing a comprehensive framework that directs future research. In the following sections, we will go through each of the steps in further detail.

4 Research profiling

We classified the studies in terms of yearly distribution, research design, industry-wide distribution, the employee job outcomes evaluated, ESs user types, the theories used,
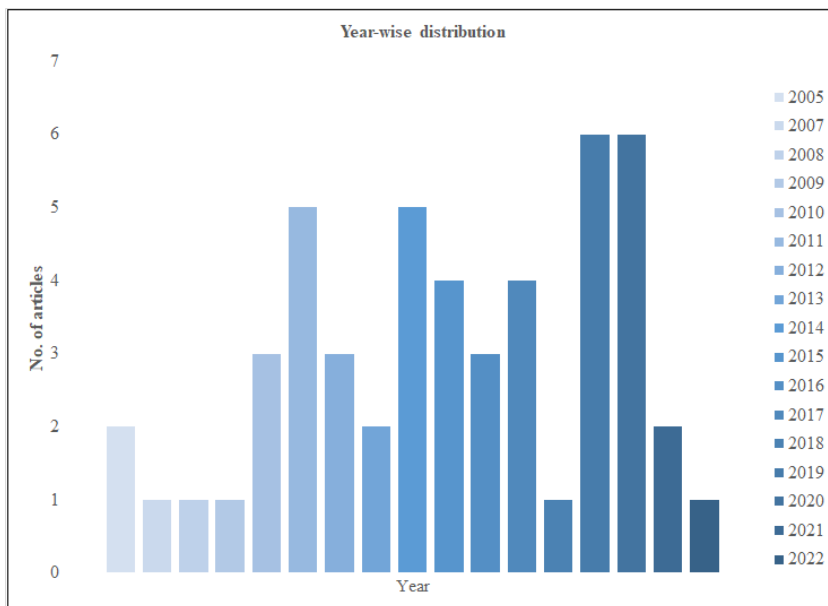
Figure 2. Yearly distribution of published studies

and ESs lifecycle, all of which were used to determine the current state of the research linking the association between ESs and employee job outcomes. Figure 2 depicts the yearly distribution of publications. Due to the focus on critical success factors (CSFs) such as top management support, change management, and end-user training and education (Vargas & Comuzzi, 2020) during the initial years of ESs implementation, we find no studies in the early years of the decade that focused on employee job outcomes. However, we observe that a later trend in the number of articles signifies the rising interest in exploring the impact of ESs on employee job outcomes, which are believed to be altered both during and post-implementation phases. (e.g., Chung et al., 2014; Sykes, 2020).

While most studies (about 86%) used a quantitative technique (as indicated in figure 3), about 14% of studies used a qualitative methodology. Regression analysis, factor analysis, structural equation modelling, network analysis, content analysis, and case study were the most used data analysis approaches in the prior literature. PLS-Structural Equation Modelling (PLS-SEM) is the most used technique. Figure 3 depicts the pie chart of the sample studies based on the research design. The greater generalizability and the ability to draw theoretical inferences in different contexts could be one of the reasons for a higher number of quantitative studies.
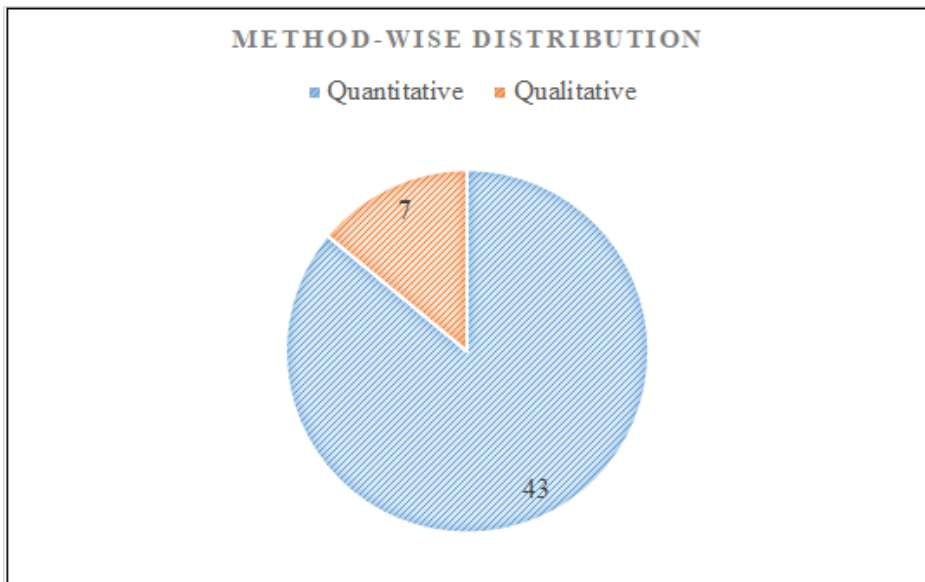
Figure 3. The research design of the studies

The industry-wide distribution of the studies used in the review is depicted in Figure 4. Most of the studies' research setting was chosen in the manufacturing industry, as the initial ESs such as materials requirement planning (MRP) have essentially evolved from this industry (Mabert, 2007). The remaining studies used IT, healthcare, tele-
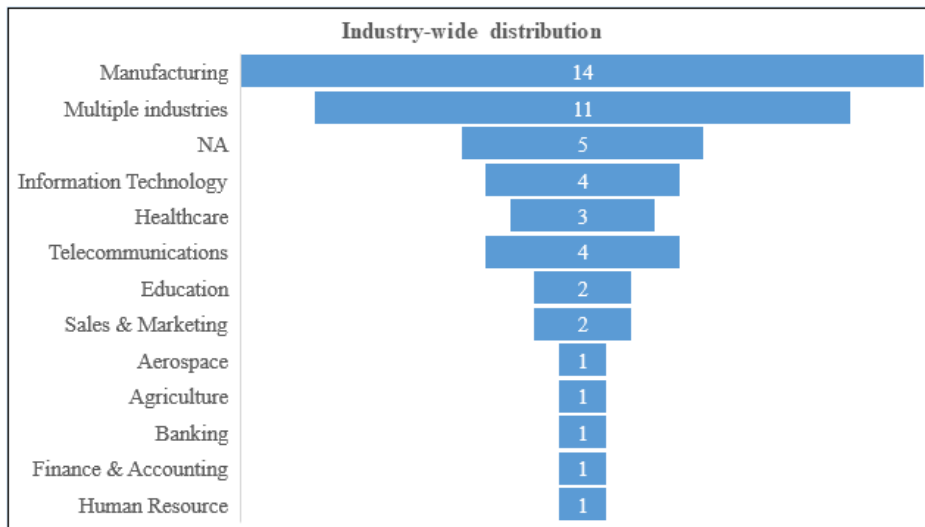

Figure 4. Industry-wide distribution

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communications, and other industries as their sample for research, while 22% of the studies chose multiple industries (e.g., HRM and SCM) as their context for analysis to derive more generalized inferences. Banking, finance, and accounting, as well as human resource management, have received the least attention due to the importance of other industry-specific key performance metrics such as business performance, financial performance or firm performance that take more precedence over employee job outcomes owing to the costs involved with the ESs implementation.

Table 2 shows the number of studies that investigated concurrent employee job outcomes from the review sample. While the majority of studies used a single job outcome as their dependent variable (DV) (e.g., Bhattacharya & Wamba, 2015; Saeed et al., 2010), a few others have explored multiple job outcomes (e.g., Bala & Bhagwatwar, 2018; Motwani & Sharma, 2016). A vast majority of the ESs research (24 studies) focused solely on job performance as the primary DV, followed by job satisfaction (6 studies) and intrinsic motivation (6 studies) which fall under positive job outcomes. Only a handful of studies have investigated negative job outcomes that included turnover intention (2 studies) and exhaustion (1 study). These numbers represent the focus on job outcomes in the context of ESs in the prior literature.

	Employee Job outcomes	1	2	3	4	5	6	7	8
Positive	Job satisfaction	6							
	Job performance	7	24						
	Commitment	0	1	0					
	Intrinsic motivation	0	1	0	6				
	Low absenteeism	0	0	0	0	0			
Negative	Turnover intention	1	0	0	0	0	2		
	Exhaustion	1	0	0	0	0	0	1	
	Work withdrawal	0	0	0	0	0	0	0	0

Table 2. Employee job outcomes-wise distribution

The majority of the studies that looked at the association between ESs and employee job outcomes in the manufacturing industry focused on job performance and job satisfaction as their primary DV(s) (e.g., Bala & Venkatesh, 2016; Rai & Hornyak, 2013). Ke et al. (2012) investigated intrinsic motivation, while Brattin et al. (2019) explored employee turnover intentions. Similarly, studies that employed data samples

from multiple industries have typically looked at a single job outcome (e.g., Rajan & Baral, 2015).

While it is critical to understand the data sample used from various industries, as well as the DV(s), investigated, it is equally important to examine which users have been using these system(s) and the impact ESs will have on their job outcomes. For example, Sedera and Lokuge (2019) looked at the user performance of operational, management, and executive (strategic) staff who used SAP in their firm. Their study offered some important insights in terms of the variances in how various users perceive and use ESs. In line with the above arguments, we classified the studies based on the sample characteristic: ESs user type.

ES Users	Operational	Managerial	Strategic	All
Operational	34			
Managerial	7	3		
Strategic	1	1	0	
All				4

Table 3. Distribution based on ES user-type

The ESs user type distribution is shown in Table 3. It can be seen that most empirical investigations (34 studies) have focused only on the operational users (e.g., Bala & Bhagwatwar, 2018; Uddin et al., 2019). Looking at this number we can interpret that operational users are the people who use ESs most compared to other sets of users. This is intuitive since ESs are implemented to digitalize most of the business processes that are utilized by operational users to execute their day-to-day tasks. Only managerial users as sample data were used in three studies (e.g., Hornyak, 2012). One study investigated managerial and strategic users (Rai & Hornyak, 2013), while seven studies focused on both operational and managerial users (e.g., Hietala & Päivärinta, 2021). One study used both operational and strategic users as its sample (Azizah et al., 2020). Finally, four studies investigated all three types of users (Chung et al., 2014; Liu et al., 2011; Saeed et al., 2010; Sedera & Lokuge, 2019).

We observed that over half of the studies in our review analysis (25 studies) used a theoretical lens to empirically investigate the ESs implementation effects on employee

job outcomes. The majority of them used either TAM or the unified theory of acceptance and use of technology (UTAUT) (e.g., Rajan & Baral, 2015; Sun et al., 2009), while others used the job characteristics model (Morris & Venkatesh, 2010), Delone Mclean's IS success model (Sedera & Lokuge, 2019), self-determination theory (Ke et al., 2012), innovation diffusion (Bhattacharya & Wamba, 2015), task-technology fit model (Azizah et al., 2020) etc.

Prior literature classified ESs lifecycle into four phases namely (i) the project charting phase, (ii) the project configuration phase, (iii) the shakedown phase, and (iv) the onwards and upwards phase (Markus & Tanis, 2000). The first two phases focus on the decisions that define the business cases for ESs implementation with a focus on solution constraints along with finalizing a potential enterprise system (e.g., Oracle ERP or SAP etc.). The shakedown phase begins from the project's go-live till a year of operations that help stabilize the system and eliminate bugs till normal operations are achieved. Finally, the onwards and upwards phase consists of activities related to the maintenance of the system, support of various user groups with continuous training and help in the upgradation of the system when and where required (Markus & Tanis, 2000). Based on the ESs lifecycle phases, we classified the studies of this review into four categories and tabulated the results in the appendix table A2. From this classification we could see that the majority of the studies were undertaken during the shakedown and onward and upwards phases of ESs lifecycle, given that job outcomes would be most impacted during the project's go-live and post-implementation stages, the period of significant disruption (Bala & Venkatesh, 2013).

Furthermore, we analyzed this classification and presented the results in table 4. It can be observed that job performance was the most frequently investigated factor followed by intrinsic motivation and job satisfaction during the shakedown phase among positive job outcomes. Turnover intention and emotional exhaustion were the negative job outcomes that were investigated. However, during the onward and upwards phase of the ESs lifecycle, it can be noticed that job satisfaction got equal prominence along with job performance followed by intrinsic motivation and organizational commitment on the positive outcomes side and turnover intention and emotional exhaustion on the negative outcomes side. This mapping provides useful insights into the association between ESs lifecycle phases and job outcomes.

5 Thematic foci

We conducted a thematic content analysis on the final sample of studies to explore employee job outcomes in the ESs context following the steps proposed by Anderson

ESs lifecycle Job outcomes		No. of studies	
		Shakedown phase	Onwards and upwards
Positive	Job satisfaction	2	11
	Job performance	18	11
	Intrinsic motivation	5	2
	Commitment		2
	Low absenteeism		
Negative	Turnover intention	1	2
	Emotional exhaustion	1	1
	Work withdrawal		

Table 4. Employee job outcomes and ESs lifecycle associations

(2007). For detailed step-by-step guidance on conducting thematic content analysis, please refer to the guidelines suggested by Anderson (2007). Thematic content analysis is a well-established technique for evaluating and synthesizing qualitative data (Ruparel et al., 2020). Six broad themes emerged from our analysis, as illustrated in figure 5. The themes and the variables associated with them are illustrated in table 5. The definitions for the variables of each theme have been tabulated in appendix table A4. As can be observed in figure 5 and table A2 (see the year from the 'reference' column)
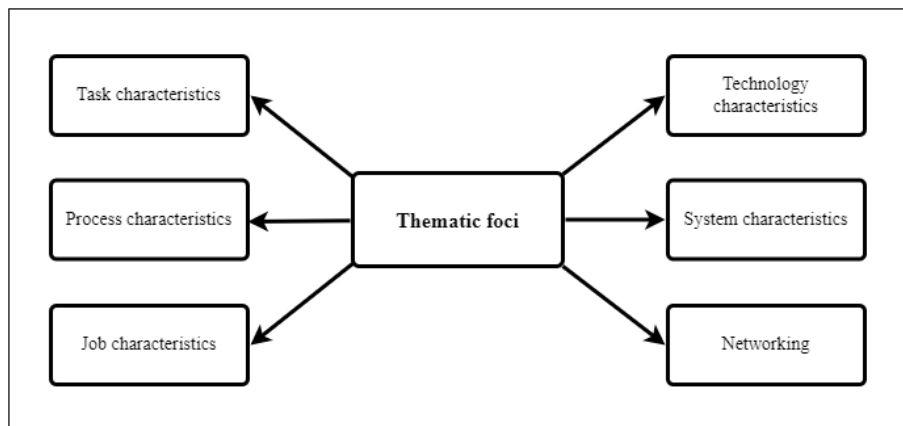

Figure 5. Thematic foci

in the appendix, there is a shift in the contemporary use of ESs from right to left (except networking). The research on technology characteristics and system characteristics started in the early 2000s whereas, for the left-side themes, it started around 2010 with more and more research focusing on job characteristics. The reason for this interesting shift could be the change in work designs from a more dynamic and knowledge-based (Grant & Parker, 2009) to a more connected and collaborative work design both within and between organizations (Parker et al., 2017). This shift mirrors the organization's shift towards more granularity in the work designs (i.e., job characteristics, task characteristics and process characteristics) from more abstract work modules. The following sections provide an in-depth discussion of the themes identified.

5.1   Technology characteristics

The term 'technology characteristics' refers to the properties of information technology that aid in its comprehension (Aiman-Smith & Green, 2002). These characteristics are critical in shaping employee attitudes and behaviours towards the technology being implemented (e.g., perceived usefulness, perceived ease of use) (Liere-Netheler et al., 2017). The sample of studies that investigated technological characteristics in the context of ESs implementation, focused primarily on job performance and job satisfaction as their DVs, with only a few of them focusing on intrinsic motivation (Guo et al., 2014), and turnover intention (Shahreki et al., 2019). The characteristics such as usability, data quality, and service quality can be utilized to elicit perceptions of perceived usefulness which contributes to positive job satisfaction (Liere-Netheler et al., 2017). Uncertainty about technology, abstractness, radicalness, and complexity may result in negative job outcomes (Alnuaimi, 2010). Technology complexity, reconfigurability, and customization are also factors that contribute to the formation of perceptions regarding process characteristics and subsequent job outcomes (Bala & Venkatesh, 2013). As a result, it is crucial to be aware of these characteristics and sensitive to the associated perceptions and their impact on job outcomes.

5.2   System characteristics

Typically, the implementation of an ES(s) is accompanied by a redesign of business processes and their integration into the system (Robey et al., 2002; Volkoff et al., 2007). Implementation demands the acquisition of new skills and capabilities that force employees to learn how to use the system, gain new skills, and get familiar with new busi-

Sr no.	Thematic foci	Variables	Sample References
1	Task characteristics	Task productivity; Task innovation; Task mobility; Task type; Task complexity; Task efficiency	Azizah et al., (2020); Deng & Wang, (2014); Jalal, (2011); Liere-Netheler et al., (2017); Saeed et al., (2010)
2	Technology characteristics	Complexity; Reconfigurability; Customization; Uncertainty; Abstractness; Usability; Data quality; Service quality	Alnuaimi, (2010); Bala & Venkatesh, (2013); Liere-Netheler et al., (2017); Pai & Tu, (2011)
3	Process characteristics	Process complexity; Process rigidity; Process radicalness; Process clarity; Process identity; Process interdependence; Process standards	Bala & Venkatesh, (2013); Bala et al., (2021); Brattin et al., (2019); Hornyak, (2012)
4	System characteristics	System complexity; System reliability; System accessibility; System quality; System use; System satisfaction; System controllability; System usefulness	Alnuaimi, (2010); Azizah et al., (2020); Bala & Venkatesh, (2016); Bala & Bhagwatwar, (2018); Ghani et al., (2018); Maier et al., (2015); Sedera & Lokuge, (2019)
5	Job characteristics	Job demand; Job control; Job stress; Job autonomy; Job security; Job anxiety; Job specifications; Job difficulty; Job discretion; Job effectiveness; Task significance; Identity; Feedback; Skill variety; Autonomy	Bala & Venkatesh, (2013); Bala & Bhagwatwar, (2018); Ke et al., (2012); Liu et al., (2011); Morris & Venkatesh, (2010); Sykes, (2020)
6	Networking	Give advice; Get advice; Traditional support structures (training, online support, help desk support, change management support); Peer advice ties; Psychological safety climate	Sykes et al., (2014); Sykes, (2015); Sykes & Venkatesh, (2017)

Table 5. Themes and corresponding variables

ness processes (Alvarez, 2008; Häkkinen & Hilmola, 2008; Nah & Delgado, 2006) which can be frustrating, reducing their ability to meet daily work demands (Ayyagari et al., 2011), resulting in exhaustion (Maier et al., 2015). Additionally, these complex systems frequently confront employees by requiring additional steps to complete a task without adding value or prolonging the execution of the task making the system unreliable. Hence, system reliability becomes a key characteristic that must be addressed during implementation to reduce workload. Other system characteristics, such as system accessibility, and system quality are also critical for comprehending the system and training employees per the system requirements that contribute to achieving desired results (Azizah et al., 2020).

Individuals, according to coping theories, will construct an overall perception of control based on their current degree of competency to deal with a demanding circumstance and their ability to leverage external resources that will assist them in dealing with the issue, among other factors (Beaudry & Pinsonneault, 2005; Carver et al., 1989; Major et al., 1998). Employee job performance and job satisfaction are influenced by perceived system controllability, which is achieved through technology adaption mechanisms such as exploration-to-innovate, exploitation, exploitation-to-revert, and avoidance (Bala & Venkatesh, 2016). It is also interesting to note that it has a direct impact on job performance and job satisfaction. Consequently, it becomes critical for both operational and managerial users to understand system characteristics to reap the full benefits from ES(s).

5.3 Networking

Employees' inability to acclimatize to new business processes and software, and therefore their new (i.e., redesigned) jobs that are integral components of a new ES(s), is a major source of difficulty in implementing ESs (e.g., Morris & Venkatesh, 2010). The design of the ESs plays a prominent role in forming perceptions about the systems implemented. Depending upon the design of the IT systems (ESs) with different intentions (i.e., to provide information or to automate) the employees will understand or perceive different implications (i.e., empowering and upskilling or controlling and deskilling, respectively) (Zuboff, 1988). Furthermore, from many of Zuboff's case studies, it has been inferred that the appropriation and deployment of technology are dependent on the social and economic forces of the organization beyond pure managerial intent (Orlikowski, 1992). Linking the economic aspect when new systems are implemented, firms typically use training (Marler et al., 2006) and continuous support, such as help desks and documentation, to help employees transition into the system for their

work-related tasks (Sykes et al., 2009). Given the high failure rates of ESs, these traditional support structures, alone, seem to be ineffective (Sykes, 2020). Complementing with these support systems, fellow employees or peers, with the domain expertise of the underlying business functions/processes who could better comprehend the system (Sykes et al., 2014; Sykes, 2015), would be of great help to each other if nudged in a direction to form strong network ties. This elicits the social aspect of Zuboff's cases. Typically, to perform their job more effectively, employees in a particular workplace setting (e.g., a business unit) collaborate to obtain and provide information, assist each other, and expert advice to and from one another (Sparrowe et al., 2001). The interactions and the relationships within the business units in which employees as actors (e.g., individual employees, groups, and organizations) are embedded are called social networks (Sykes, 2015). According to the findings of a study by Sykes et al. (2014), employee advice networks have had a substantial impact on post-implementation job performance. It is also important for the employees to understand the content of the network (i.e., advice or impeding) and the source of the node (i.e., friend or acquaintance) in a network setting such as a business unit that may affect their system use and subsequent job performance (Sykes & Venkatesh, 2017). Apart from peer network support, getting top management support and project management support (Motwani & Sharma, 2015) along with a psychological safety climate (Shao et al., 2017) to try new ways of doing their job to improve performance using the new ESs are considered equally important. To reap the full benefits from ESs, organizations should cultivate an environment that encourages networking among employees both from and across business units.

5.4 Task characteristics

The task characteristics have been researched in organizational behaviour literature, with an emphasis on their impact on team performance and team member satisfaction (Li et al., 2009). Tasks are commonly described as the activities that individuals perform to convert inputs to outputs (Goodhue & Thompson, 1995). The task characteristics of interest are those that cause a user to heavily rely on information technology. For example, a user would value an information system's ability to query a database of operational data more if they had to answer several diverse and unpredictable questions (Goodhue & Thompson, 1995). Using this definition of task characteristics as a starting point, we examined studies that explored employee job outcomes using various task characteristics in the context of ESs implementation.

User expectations for the ESs' potential to enhance performance at work might be expressed in terms of the exploitation and exploration paradigms (Gupta et al., 2006)

where productivity and innovation are good indicators of individual performance. The findings of the study conducted by Saeed et al. (2010) revealed that task productivity and innovation expectations have a significant impact on the intention to use ESs, as well as pre-adoption user acceptance, which has a subsequent effect on individual performance. That is, higher expectations for productivity and innovation, increased intention to use the technology and increased pre-adoption acceptance. Task type and complexity also have an impact on individual performance (i.e., task efficiency) through customer-oriented organizational citizenship behaviours (OCBs) (Deng & Wang, 2014). This suggests that tasks of varying types and degrees of complexity evoke various OCBs, which directly affects task efficiency (i.e., performance). In sum, task characteristics assist in the formation of perceptions about ESs, which in turn aids in job performance improvement.

5.5 Process characteristics

Bala and Venkatesh (2013) conceptualized process characteristics as employees' perceptions of the work processes while implementing enterprise systems. In their study on evaluating job satisfaction in the context of ESs implementation, they investigated work process characteristics along with technology characteristics to understand the impact of perceptions of job characteristics change over time. They developed a nomological network of factors affecting job characteristics and job outcomes during the shake-down phase of an ESs implementation, which is the most critical phase. The results disclosed that process characteristics significantly affected job characteristics and subsequent job outcomes. Changes in the interpersonal relationships with co-workers may not only elicit negative reactions to the ESs being implemented but may also have repercussions that impair both individuals' and organizations' ability to fully benefit from the ES(s) implemented (Bala et al., 2021). Eventually, these changes in work process characteristics induced by perceptions about interpersonal relationships will affect individual job performance and job satisfaction.

Along with employee perceptions of the changes that ESs implementation will bring to work process characteristics, existing work process characteristics serve as a critical baseline against which employees can evaluate the impact of the implementation on their job performance. Pre-implementation process characteristics such as process identity, interdependence, and standards are critical in motivating employees to pursue cognitive adoption of the implemented system (Hornyak, 2012). The IS literature has established that organizational and technical interventions, as well as social support, are critical implementation factors influencing users' evaluations of new ESs. Imple-

mentation characteristics, such as facilitating conditions and social influence, do help to moderate the relationship between pre-implementation work process characteristics and employees' job performance beliefs (Hornyak, 2012).

According to the job role literature, an individual's intention to leave an organization increases when they lack clarity about their work tasks and their role in attaining the company's broader goals (Fisher & Gitelson, 1983; Fried et al., 2008). As employees become aware that their current job context is no longer relevant to the post-implementation organization, these perceptions of clarity evolve. In addition to user training, process clarity and goal clarity are critical in determining employee turnover intentions, which allows firms to better understand the consequences of implementing ESs (Brattin et al., 2019). Therefore, it becomes important for organizations to investigate process characteristics to assess the effects that they have on both pre-and post-implementation organizational goals as well as employee job outcomes.

5.6   Job characteristics

Employees perceive that their work loses its significance and variety, which is inherent in the old job, following an ES(s) implementation, as most job components are off-loaded to the new system post-implementation (Morris & Venkatesh, 2010). Additionally, as a result of the implementation, business processes become more inextricably linked and interwoven, making job tasks less apparent to any employee (Morris & Venkatesh, 2010). Moreover, these job characteristics would evolve in line with the ESs implemented providing employees with new challenges until they adjust their routine working mechanisms with the new system. Therefore, before deciding to implement ESs, businesses need to understand the nature of job characteristics and any potential changes that implementation may cause. Additionally, they need to continuously monitor employee job outcomes to determine whether or not the evolved job characteristics may impact the outcomes.

Prior literature has extensively studied the job characteristics model (JCM) in the context of information systems in general (e.g., Galup et al., 2008; McKnight et al., 2009) and ESs (e.g., Bala & Venkatesh, 2013; Morris & Venkatesh, 2010) in particular. Most research has established the validity of the Job Characteristics Model (JCM) as a measure of *"the degree to which a job requires a variety of distinct activities to be completed, each of which requires the use of a variety of the employee's skills and talents"* (Ali et al., 2014, p. 47). ESs implementation was found to moderate the association between job characteristics—skill variety, autonomy, and feedback—and job satisfaction, while the relationship between task identity and task significance remained unaltered post-imple-

mentation (Morris & Venkatesh, 2010). Interestingly, a recent qualitative exploratory study proposed an extension to the JCM model in which they found that, in addition to job characteristics, technological characteristics were significant antecedents of job satisfaction (job outcome) via mediation mechanisms such as critical psychological states and perceived usefulness (Liere-Netheler et al., 2017). Consequently, we explored the review sample to identify which other job characteristics, as per the definition of JCM, affect job outcomes. Apart from the five characteristics outlined in the JCM, we unearthed several additional job characteristics such as job demand, job control, job stress (Bala & Venkatesh, 2013; Sykes, 2020), job difficulty, job discretion (Jones et al., 2011), job specifications (Liu et al., 2011), job security, job anxiety (Bala & Bhagwatwar, 2018), and job scope (Venkatesh & Goyal, 2022) that affect job outcomes. Most of these characteristics were in line with the proactive perspectives proposed by Grant and Parker (2009).

Furthermore, the need for more relational perspectives of work (re)design, since post-implementation work is more connected and collaborative, as evidenced by our analysis (Grant & Parker, 2009). The findings from a study conducted by Sykes (2020) corroborate this through her investigation to find the impact formal and informal organizational support structures have on job characteristics and job outcomes through a job strain model. It was evidenced that informal support structures (ISS) have a significant effect on job characteristics i.e., job control and job demand as well as job outcomes i.e., job satisfaction and job performance compared to formal support structures. ISS symbolizes the self-organizing social ties that grow over time as employees interact and share information about their jobs within the organization (Sykes, 2020). Additionally, it was found that ISS contextualizes the significance of connectivity and a collaborative attitude in employees by moderating the relationship between job characteristics and job outcomes (Sykes, 2020). Socialization tactics—organizational formal and informal events, one of the organizational levers was found to induce intrinsic motivation in employees which led to exploratory ESs usage and exploration satisfaction (Ke et al., 2012). There is a need to make use of the contextualization of work (re)designs in ESs implementation projects to understand how the nature and scope of work (re)design impact job characteristics and subsequent job outcomes. One way to achieve this goal could be to imbibe a socio-technical perspective into work environments and realize the interdependence between social and technical subsystems (Jónasdóttir & Müller, 2020).

6 Gaps, future research, and a comprehensive framework

Our review of the prior literature enabled us to get a bird's eye view of the existing research, allowing us to gain a comprehensive understanding of the research in the field of IS relating to the association of ESs and employee job outcomes. Our review assisted in identifying various research gaps that can serve as a basis for future research agendas and would aid in the development of managerial implications that could guide businesses in implementing ESs, bearing in mind how employee job outcomes are shaped over different phases of the ESs lifecycle.

6.1 Gaps and future research avenues

Our review highlights the gaps and suggests future research avenues using the TCCM framework (Paul & Rosado-Serrano, 2019). Figure 6 depicts various components of the framework adapted and developed for our review. The framework helped in identifying and analyzing the widely used theories, different contexts, characteristics, and method-
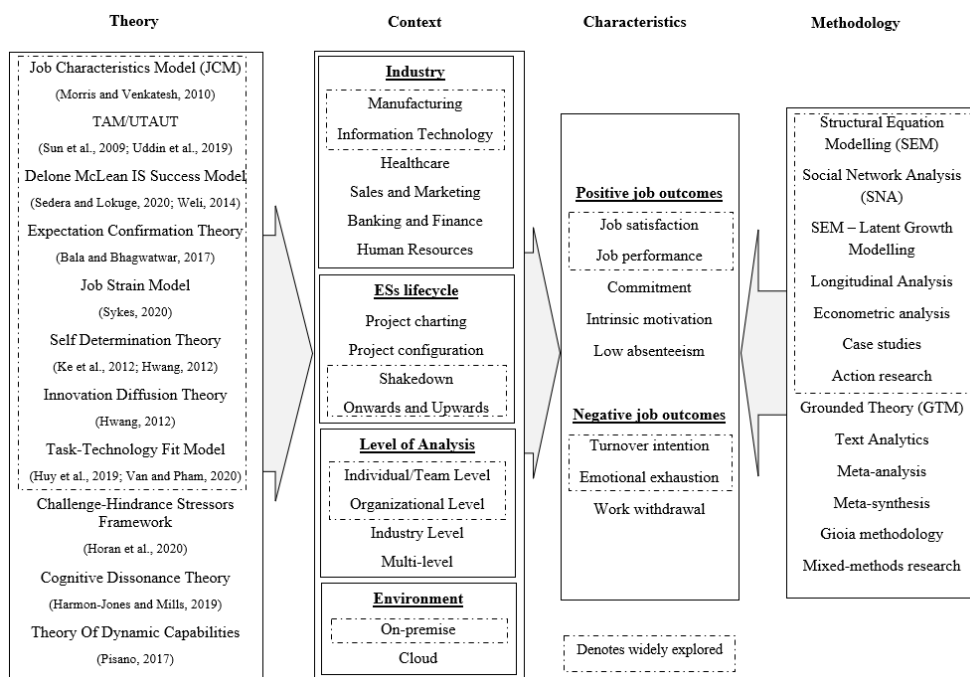

Figure 6. TCCM framework (Paul & Rosado-Serrano, 2019)

ologies employed in the studies of our synthesis as well as suggested potential avenues for future research. The following sub-sections provide a detailed elicitation of the use of the TCCM framework and the gaps identified through the framework.

Theory

Most of the studies used a prominent theoretical lens to understand the phenomenon (e.g., Morris & Venkatesh, 2010; Uddin et al., 2019) which helps to draw considerable theoretical generalizations. TAM or UTAUT were used by the majority of them (e.g., Rajan & Baral, 2015; Sun et al., 2009), while others employed the job characteristics model (Morris & Venkatesh, 2010), Delone Mclean's IS success model (Sedera & Lokuge, 2019), the self-determination theory (Ke et al., 2012), innovation diffusion (Bhattacharya & Wamba, 2015), task-technology fit model (Azizah et al., 2020). The possible explanation, for seeing a majority of the studies employing TAM/UTAUT or other closely related theories, could be to understand the users' behavioural intentions to use and to capture the early reactions to the implementation of ESs. However, a third of the studies did not use any theoretical framework or guiding theory. Figure 6 presents the theories that were predominantly used in the prior literature under the 'theory' section.

We identified a few more contextual theories that could be used for future studies. For example, at an individual level, cognitive dissonance theory (Harmon-Jones & Mills, 2019) could be used to understand the nuances of the dissonances created through ESs implementation compared to pre-existing systems in the organizations and their subsequent impact on employee job outcomes. At an organizational level, the theory of dynamic capabilities (Pisano, 2017) could be used to observe how ESs implementation could enhance organizational dynamic capabilities that give an edge to building competitive advantage of the firms effectively using ESs. This requires the employees to make full utilization of the system implemented which also could have implications on employee job outcomes. Such a study could employ a multi-level analysis to address the potential research questions which look at the core of dynamic capabilities theory. Future studies should look at theories of various disciplines which can be contextualized to understand the relationship between ESs and employee job outcomes. We also view that the use of a challenge-hindrance-stressors framework would be apt in the context of ESs implementation as they disrupt the existing work structures creating challenges to the daily routine of employees which may impact their job outcomes (Horan et al., 2020; LePine, 2005; Pearsall et al., 2009). With the use of diverse

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contextual theoretical lenses, we could unearth more underlying intricate dimensions of the phenomenon that links ESs and employee job outcomes.

Context

We observed that most of the studies covered a wide range of industry settings such as manufacturing thus offering a holistic (e.g., Bala & Venkatesh, 2016; Uddin et al., 2019), telecommunications (e.g., Sykes & Venkatesh, 2017; Venkatesh & Goyal, 2022), information technology (Hornyak et al., 2020), healthcare (Bhattacharya & Wamba, 2015), education (Andrianto, 2019), marketing (Jones et al., 2011). However, a majority of the studies were conducted in the manufacturing setting. While this enriches the literature, it also raises concerns about generalizability, as the findings cannot be extended to different industry contexts. The issue of generalizability could be resolved by developing more parsimonious research models based on well-developed and validated theories (e.g., Uddin et al., 2019). The abstract models produced can be used to mimic the phenomena of interest across industries.

Furthermore, considering the ESs lifecycle, the onwards and upwards phase is the most researched followed by the shakedown phase. While studying the current phenomenon in both contexts is important, it would give much more nuanced insights if we can look at their impact on job outcomes at the junctures of different phases of the lifecycle. For example, consider looking at the change in job outcomes during the transition from the shakedown phase to the upwards and onward phases. This captures how employees cope with routinized tasks over time vs new tasks immediately after go-live that may impact job outcomes. Subsequently, the study of the job outcomes at the cusp of disruption caused due to the implementation forms a fraction of ESs lifecycle. We believe considering investigating the long-run vs short-run implications on job outcomes with the ESs implementation would bring interesting findings. For example, in the short run, providing everything with the implementation works as planned, may bring in a positive change in the employee job outcomes. Whether this change sustains over the long run post-implementation is a question that needs an answer from longitudinal research. More interesting would be to plot job outcomes against ESs lifecycle phases to see if it follows an exponential curve, a straight line else a U-curve or an inverted U-curve. Though there are a few studies that capture this phenomenon at the juncture of project configuration and shakedown phases (pre- and post-implementation) which encapsulate the change in job outcomes during the disruption (e.g., Bala & Bhagwatwar, 2018; Hornyak et al., 2020), it is important to understand long-term continued use of the ESs and their impact on job outcomes that could lead to

the success/failure of ESs implementation. Future research could design studies that essentially capture the phenomenon at different junctures and look at their impact on job outcomes in the long-run, post-implementation vs short run immediately after the project go-live.

While single-level studies (e.g., organizational, or individual level) are necessary to achieve parsimony and focused observation of the phenomena, multilevel studies provide a holistic view of the phenomena. Multilevel studies help in understanding the interplay of critical variables, eliciting insights from the interaction of variables at many levels (Yen et al., 2015). They consider the intricate organizational structures that are necessary for analysis. For example, organizational-level factors such as system quality, information quality and service-oriented organizational citizenship behaviour moderate the relationship between perceived employee benefits and workload on employees' loyal use of ESs (Yen et al., 2015). No multilevel investigation was conducted, in the studies analyzed in our review, suggesting a strong need for multilevel studies. Future research could examine the possibility of how group-level factors (e.g., team learning or psychological safety) influence individual-level variables (e.g., job satisfaction). Additionally, there is a need to investigate the impact of organizational decisions on the group and individual-level elements that may affect implementation (e.g., Gefen & Ragowsky, 2005).

All the studies analyzed in our review were conducted with on-premise ESs, providing an opportunity to investigate the phenomenon with cloud ESs. Lower upfront and operating costs, rapid implementation, elasticity provided to scale up and down, and improved accessibility, usability, and mobility are some of the plethoras of benefits cloud ESs offer (Abd Elmonem et al., 2016). These benefits could lead to a paradigm shift in employee perceptions about ESs and their work re-design. Future research could benefit from investigating the shift in employee dispositions due to cloud ESs implementation in various business settings (Chu & Nguyen, 2022).

Characteristics

Research on positive job outcomes is predominant in the ESs context in comparison to negative job outcomes. Job satisfaction and job performance were investigated in a multitude of studies along with minimal attention to organizational commitment, intrinsic motivation, and low absenteeism. 45 of 50 studies explored either one or more positive job outcomes leaving only 5 studies that looked into how ESs implementation context triggered negative job outcomes (e.g., Brattin et al., 2019; Maier et al., 2015). Implementation of ESs brings in a huge disruption to the daily operations of employees

which may cause a myriad of negative reactions to the implementation. These reactions could translate into negative job outcomes such as turnover intention, emotional exhaustion, or work withdrawal traits. The main reason for such negative reactions ascribes to the fact that ESs implementation along with operational disruption creates a complex work environment. For example, during the shakedown phase, employees need to learn the new system while performing their operational tasks. This is not as straightforward as it looks since navigating through the new system is not natural to all employees given the complexity ESs bring to the already existing complex work processes and workflows. Future research should consider studying how ESs new workflow or new processes would pile up more work to the already existing workload which may result in exhaustion as well as intentions to quit or work withdrawal. To enhance our knowledge of negative job outcomes future studies should focus on exploring how the disruption caused by ESs, impacts different negative job outcomes. Future studies may also investigate a combination of these outcomes to understand the impact of ESs on different job outcomes (e.g., Bala & Bhagwatwar, 2018) depending upon the different contexts and ESs lifecycle. Additionally, few of the studies did not control for variables such as ERP experience, organizational tenure, age (e.g., Huy et al., 2019) that would have helped in yielding accurate relationship estimates of the constructs (Spector & Brannick, 2011).

Furthermore, only a small fraction of the studies (around 32%) used either moderator or mediator variables. For instance, while determining the effects of PEOU, PU, attitude and compatibility on perceived job satisfaction, Bhattacharya and Wamba (2015) considered only task feedback and task significance as moderating mechanisms leaving other job characteristics—task identity, autonomy, and skill variety which could have shed light on newer moderators of JCM. On a similar note, the impact of job characteristics—job control and job demand on job outcomes—job stress, job satisfaction, and job performance is moderated by support structures—formal support structures and informal support structures (Sykes, 2020). Our review findings found a few more moderator variables such as process standardization (Hornyak et al., 2020), goal clarity (Brattin et al., 2019), ERP system implementation (pre vs. post) (Morris & Venkatesh, 2010), work process interdependence (Rai & Hornyak, 2013) etc. The mediating variables found in the review are job characteristics (Sykes, 2020), user acceptance (pre vs. post) (Saeed et al., 2010), effective ES use (Hornyak et al., 2020), and team performance (Bellini et al., 2020) etc. Future studies may explore other contextual mediator or moderator variables that help improve the knowledge base on the association between ESs and employee job outcomes.

Methodology

While most studies of the sample employed a quantitative research methodology, a few of them used a qualitative research design. Although quantitative methods such as surveys would sure provide greater theoretical generalizability, qualitative studies such as case studies provide deeper insights about the phenomenon that helps understand the nuances of the underlying relationships with richer context. They provide contextual generalizability which would help in gaining varied perspectives when applied to similar contexts. Future research should focus more on conducting qualitative studies along with a variety of methods such as multi-methods, and mixed-method studies to validate and reinforce the findings (Sia et al., 2002). For example, conducting ethnographic studies (Pors et al., 2002) in the context of how intelligent collaborative ESs impact employee perceptions about ESs and their subsequent impact on employee job outcomes would provide interesting avenues for research (Unhelkar & Arntzen, 2020).

Most of the research studies depended on data collected from employees of firms that were implementing enterprise systems. Even though no study employed a student sample or secondary data, several of them used relatively small sample sizes (e.g., Hornyak et al., 2020). Because of the small sample sizes in comparison to the target population, the representativeness could be inflated, resulting in concerns with reliability and validity. However, in future studies, this gap could be addressed by obtaining sample sizes that are comparable to the study's population while also taking into consideration practical viewpoints on the minimum effect size that the researcher(s) believes is required to test the hypotheses (Westland, 2010).

Employing voluntary, self-reported surveys inherently introduces a selection bias into the data collection process, as respondents remain guarded in their responses and do not always provide accurate responses (Ghani et al., 2019). This results in biased estimations, which leads to incorrect inferences. The social desirability bias (SDB) is a significant bias that can affect the outcomes of self-reported, voluntary surveys (Larson, 2019). Apart from SDB, researchers should be cautious of response and attrition biases in longitudinal studies (Bala et al., 2021). On the other side, interviews may direct respondents toward the researcher's desired outcome(s). Most of the studies included in this review collected data by self-reporting, interviews, and voluntary surveys. Future research may solve this issue by conducting field experiments that are naturally bias-free, and high on internal validity, resulting in findings that are comparatively more accurate and reliable.

Furthermore, table A5 in the appendix provides a glimpse of the association between thematic foci, ESs lifecycle and employee job outcomes. It can be observed that during the shakedown and onward and upwards phases, all the thematic foci were

investigated. Future research could look at the juncture of project configuration and shakedown phases and their impact on job outcomes. Furthermore, job performance and job satisfaction were the most studied outcomes during shakedown as well as onward and upwards phases for all thematic foci. Organizational commitment was investigated through technology, system, and job characteristics. More interesting would be to see how task and process characteristics impact commitment and how networking would shape organizational commitment.

6.2   General research gaps

With the advent of industry 4.0 technologies, the last decade has seen a tremendous increase in the use of these technologies for various utilities by organizations. Not to dismiss the benefits they provide to the organizations, they also come up with unique challenges and barriers (Peng & Gala, 2014). The outcome of one such technological advancement is cloud ESs. Implementation of cloud ESs takes a shorter period compared to on-premise ESs since there is no hardware purchasing and installation required, and with minimum customization, it can be used directly from a web browser. Low cost, provision for customization, high scalability, and low maintenance are some of the benefits of cloud ESs (Al Hayek & Odeh, 2020). However, they also come with certain barriers that can create nightmares for organizations disrupting their operations. A lot of the companies providing cloud ESs solutions do not have robust data security infrastructure making it vulnerable. Furthermore, less transparency and limited control over data privacy raise concerns about the trustworthiness of the service providers. Apart from these, there are integration challenges and other organizational issues such as lack of top management support, inadequate change management, and improper business process redesign which are common to both cloud and on-premise ESs (Al Hayek & Odeh, 2020). These hindrances provide potential research avenues to investigate the impact of cloud ESs on employee job outcomes. Table A6 in the appendix summarizes various future avenues through potential research questions for each of the themes identified from our review.

6.3   Comprehensive framework

The systematic review guided us in developing and proposing a comprehensive framework that depicts the impact on employee job outcomes due to ESs implementation in a holistic manner, as demonstrated in figure 7. The framework's purpose is to shed light on current research trends examining employee job outcomes in the context of
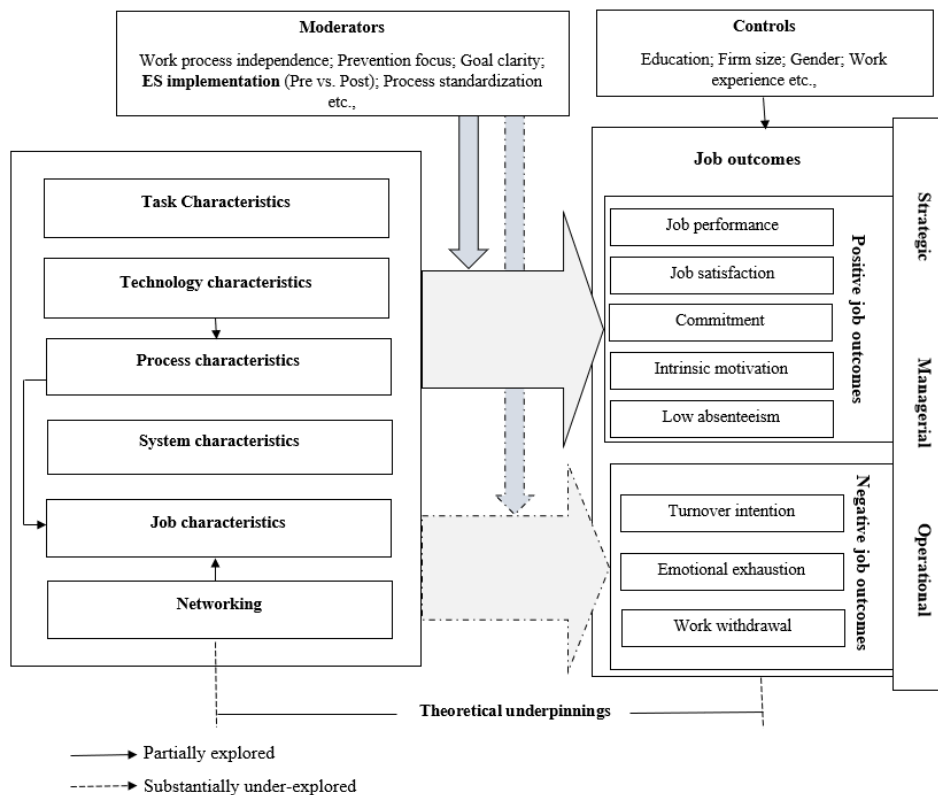
Figure 7. Proposed conceptual framework

ESs implementation and to pave the way for future research in unexplored territory. The framework incorporates two streams based on the distinction between positive and negative job outcomes in the context of an ESs implementation. The first line of research has been examined in part, whereas the second line of research remains mostly unexplored.

The following research avenues are suggested for future research agendas based on the gaps highlighted in the preceding sections. To begin, as noted previously, future studies will require methodological advancements and robust theoretical frameworks. One way to go forward in that direction is to employ mixed-method research to address both exploratory and confirmatory research questions (Venkatesh et al., 2013) which essentially helps to triangulate the findings. The complementary strengths and non-overlapping weaknesses of quantitative and qualitative methods provide a deeper understanding of a phenomenon than any method alone which can be leveraged using mixed-method research (Johnson & Turner, 2003). For example, designing a pro-

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cess-based study that utilizes the concepts of organizational fit of ESs or ESs adaptation process using Orlikowski's (1992) extended dual structuration model of technology that borrows concepts from sensemaking theory and institutional theory would help refine our understanding of the interactions between the people, technology, and institutional properties (Svejvig & Blegind, 2013) that may have a subsequent impact on job outcomes. Understanding the phenomenon from different theoretical underpinnings is crucial for ESs implementation success where employee job outcomes are at stake.

Second, we posit to study the impact on job outcomes based on user groups. The key user groups (stakeholders) in the framework are divided into three categories: operational users, management users, and strategic (executive) users (Sedera & Lokuge, 2019). As indicated in the preceding sections, operational users constitute the majority of ESs users, followed by managerial and strategic users. Though VIP users or strategic users form a minority user base of ESs, they understand and operate the system with profound knowledge since they have very intimate knowledge about the ESs implemented and business processes (Liu et al., 2011). Future research should focus on each user group to understand how ESs affect job outcomes.

Third, the prior literature placed a strong emphasis on only positive job outcomes. While it is important to focus on positive job outcomes, the negative outcomes cannot be ignored. Recent research has sparked the curiosity of those who are interested in investigating negative job outcomes (e.g., Aliyu & Nyadzayo, 2018). A longitudinal study conducted by Bala and Bhagwatwar (2018) found that pre-implementation emotional exhaustion harmed lean and rich measures of system use whereas the continued use of the system had a positive impact on emotional exhaustion post-implementation (after 6 months). Lack of job clarity (i.e., goal clarity and process clarity) and user training during an ESs implementation leads to turnover intention (Brattin et al., 2019). As a result, it is crucial to not only focus on positive job outcomes but also to examine the phenomenon from the standpoint of negative job outcomes.

Four, the impact of task characteristics and technology characteristics on negative job outcomes is substantially underexplored which provides a platform for future research. The implications of task and technology characteristics on job performance and job satisfaction were detrimental in assessing ESs implementation success (e.g., Bala & Venkatesh, 2013; Liere-Netheler et al., 2017; Pai & Tu, 2011; Saeed et al., 2010). Five, there are no studies that studied the impact of networking variables on negative job outcomes and substantially under-explored positive job outcomes. This leads to strong future directions to explore how networking variables impact both positive and negative job outcomes. Alongside the work on job outcomes, it would bring interesting theoretical perspectives if this research is further extended to understand the implications

of employee virtual co-presence through collective and collaborative mechanisms will have on ESs adoption and use (Subramaniam et al., 2013); how knowledge networks are formed during ESs implementation and their influence on job outcomes (Sasidharan, 2019). Six, process characteristics, system characteristics, and job characteristics impact on employee job outcomes have been explored partially in ESs implementation context and need holistic evaluation in future studies. We believe that the proposed comprehensive conceptual framework brings together the identified gaps and limitations through thematic foci as well as the under-explored associations, and newer dimensions that need attention to take this scholarship forward. To start with the future research from the identified gaps from our review, we postulated some of the potential research questions in table A7 in the appendix.

7   Discussion

7.1   Contributions to research

Our review contributes to the research significantly at least in five important ways. Firstly, to the best of our knowledge, this is one of the first studies to conduct a systematic review exploring the association between ESs implementation and employee job outcomes, thereby contributing to the information systems and organizational behaviour literature in the context of ESs implementation. Enterprise systems implementation has received wider attention over the past two decades due to the organizational benefits it has to offer (Abd Elmonem et al., 2016). Though the benefits are evident from past research, there have been multiple cases of implementation failures inflicting huge costs on the organization (Malik et al., 2021). Prior research had focused on the critical success/failure factors of implementation such as top management support, project team competence, and change management strategies for implementation success (Vargas & Comuzzi, 2020). While the role of these factors cannot be discounted it is also important to consider the role of employees who play a significant part both during and post-implementation. Therefore, it is imperative to investigate and understand the association between ESs and employee job outcomes (Sykes et al., 2014).

Secondly, the SLR helped in outlining the structured research profile associating the relationship between ESs and employee job outcomes. Secondly, the review unearthed six thematic foci. The themes identified are (i) task characteristics (ii) technology characteristics (iii) process characteristics (iv) system characteristics (v) job characteristics and (vi) networking. These themes may stand as a guidepost where researchers can

examine the impact of each theme on different employee job outcomes. We believe that the thematic analysis would lead to important insights for organizations implementing ESs by uncovering some practical pain points. Furthermore, we identified several dimensions for each theme as tabulated in table 5, that serve as independent contexts in themselves which could drive the ESs research further. Complementary to these dimensions, we also postulated several potential research questions through table A6 that can be taken forward by future researchers. Apart from these, considering our review as a base, future research could build on various aspects of ESs implementation such as assimilation (Saraf et al., 2013), continuance usage intentions and use (Cheng, 2018; Cheng, 2020) and post-adoption behaviours and intentions such as loyal use (Yen et al., 2015), proficient usage (Veiga et al., 2014), stakeholder management (Soh et al., 2011), and extended use (Peng et al., 2018) across different ESs lifecycle phases to study their impact on job outcomes in the long-run.

Thirdly, through the SLR we developed a comprehensive framework to provide a holistic view of the key elements from the thematic foci and employee job outcomes. The framework summarizes the current research profile while pointing toward future directions. It highlights the areas which received considerable attention in the prior literature and sheds light on underexplored areas that need more work. We provided a detailed discussion on each of the research avenues that we derived from the conceptual framework. Future research may focus on the underexplored areas using novel methods as discussed in the preceding sections.

Fourthly, the study sheds light on certain issues that require immediate consideration by research scholars. We identified that most of the studies have only used fewer theoretical underpinnings such as TAM, IS success model, JCM, and Task-technology fit to empirically test their hypotheses. Future research may use newer theories from reference disciplines to discover the various perspectives to study employee job outcomes. For example, adaptive structuration theory (AST) can be used to find out the type of structures that are formed due to the interaction of people and technologies (i.e., enterprise systems) (Ali et al., 2022).

Finally, our review emphasizes the need for multilevel studies that incorporate dimensions from different levels such as organizational, team and individual which provide a holistic vista of the phenomena. The benefits of multilevel studies have been emphasized enough in prior literature from both theoretical as well as practical standpoints (Benlian, 2020; McLaren et al., 2011). Furthermore, the use of the TCCM framework helped to critically analyze the prior research and showcased the limitations in terms of different theories used, various contexts studied, multiple characteristics explored and

unique methodologies employed. The framework also helped us highlight the nuanced dimensions that need attention.

7.2   Contributions to practice

Our review also provides significant contributions to the practice in the following ways. Firstly, our review study reemphasizes the fact that ESs implementation affects employee job outcomes. Implementation managers involved in the planning, development and deployment process should be cautious during the new system implementation and provide the required support to employees so that the result of the implementation may not turn to negative job outcomes which impact organizations in other ways such as absenteeism and work withdrawal (e.g., Scott & Barnes, 2011). Recent research on cloud ESs have begun to realize the importance of people (employee) factors as knowledge stakeholders that help build dynamic capabilities for businesses (Gupta et al., 2020). With the negative job outcomes caused due to the ESs implementation, it is highly unlikely organizations could achieve their strategic goals (Rodrigues et al., 2021).

Secondly, we suggest that the organizations implementing ESs should understand various implementation characteristics such as task, technology, process, system, and job characteristics as they impact the job outcomes given the complex nature of ESs and drive the implementation process with utmost care. The ESs are packaged solutions for various processes of the organization that require a variety of skills, autonomy to experiment and learn, and constant feedback from vendors and managers is essential. The implementation may have negative consequences if the employees are not provided with a supportive environment. Finally, the review also suggests that practitioners look for any adverse effects of ESs implementation on employees' negative job outcomes that impact implementation both during and post-implementation which ultimately may lead to non-usage of the system thus leading to ESs failure (Avison & Malaurent, 2007). But organizations should also be open to tackling the possible consequences of ESs misfits with the organizational culture and resistance from users and look for possible alternatives as workarounds that prevent possible abandonment of ESs (Malaurent & Avison, 2015).

7.3   Limitations and conclusion

We adapted and followed the review protocols as presented by Dhir et al. (2020) to ensure the rigour and relevance of the review. However, our review findings need to be interpreted considering three limitations. Firstly, the SLR is based on the studies that

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are available in three major databases (i.e., Scopus, EBSCO and WoS) which are published in peer-reviewed journals in the English language. Secondly, the list of keywords used for the database search may not be exhaustive, though we have considered all the synonymous keywords. Nevertheless, this review includes 50 peer-reviewed articles which are generally considered to be sufficient to draw inferences to gain a comprehensive understanding of the prior literature linking ESs implementation and employee job outcomes. Finally, it is possible to omit a few studies due to the reasons such as the unavailability of full texts in the databases, and inclusion and exclusion criteria used for the review. However, we are confident that the possibility of missing these studies is very minimal and would not have, considerably, affected the analysis and results.

The present study adopted the SLR methodology to distil, sift, review, and integrate the extant research on ESs implementation and employee job outcomes. It summarized the findings from prior literature and provided a platform for future research for advancing further studies in this area. It also provides useful practical and research inferences that would be helpful for ESs implementation. The study through the SLR addressed the research questions of interest RQ1: What is the current state of extant literature that investigated the association between ESs and employee job outcomes? RQ2: What research themes unfold from the prior literature linking ESs and employee job outcomes? RQ3: What future research directions emerge from the prior literature that advances the research on employee job outcomes in the ESs context through the themes identified? In doing so the review unearthed six distinct themes and developed a conceptual framework that helps both research scholars and practitioners to understand the current research on the area and provide a platform for future research.

Notes

1. We use 'implementation' to refer to *"the process of developing the initial business case and planning the project, configuring and implementing the packaged software"* (Shah et al., 2011). The use of the word 'implementation' essentially covers the first three phases of the ESs lifecycle as used throughout our review.

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Appendix A

Literature review papers on ESs

Sr no.	Reference	Reviewed articles	Years covered	Topic explored
1	Moon, (2007)	313	2000-2006	ERP
2	Ngai et al., (2008)	48	2006-2007	Critical success factors (CSFs)
3	Vakalfotis et al., (2011)	25	1995-2011	Management Accounting
4	Salleh et al., (2012)	45	NA	Cloud ERP
5	Trinh et al., (2012)	49	1998-2010	Organizational agility
6	Ebrahimi, (2012)	38	2000-2010	Knowledge management
7	Shaul & Tauber, (2013)	34	1999-2010	Critical success factors (CSFs)
8	Tarhini et al., (2015)	35	2000-2013	Critical success factors (CSFs)
9	Abd Elmonem et al., (2016)	45	2011-2016	Cloud ERP
10	Saxena et al., (2017)	254	2000-2015	Various ES themes
11	Loonam et al., (2018)	37	NA	Critical success factors (CSFs)
12	Yasiukovich & Haddara, (2020)	74	2010-2019	Cloud ERP in SMEs

Table A1. Literature review papers on ESs

References

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Studies selected for the Systematic Literature Review

Sr no.	Reference	Job outcome(s)	ESs Lifecycle	Research design	Theory used	Data sample	ES Users	Industry setting
1	Aliyu & Nyadzayo, (2018)	Job satisfaction, Intention to quit	Shakedown	Quant	NA	Field survey	Operational	NA
2	Alnuaimi, (2010)	Job satisfaction	Onwards and upwards	Quant	NA	Field survey	Operational	Healthcare
3	Andrianto, (2019)	Employee performance	Onwards and upwards	Qual	NA	University lecturers	Operational	Education
4	Azizah et al., (2020)	Individual performance	Onwards and upwards	Quant	TTF model	Field survey	Operational & Strategic	Manu-facturing
5	Bala & Bhagwatwar, (2018)	Job satisfaction, Emotional exhaustion, Organizational commitment	Shakedown	Quant	Expectation discon-firmation theory	Field survey	Operational	Manu-facturing

Sr no.	Reference	Job outcome(s)	ESs Lifecycle	Research design	Theory used	Data sample	ES Users	Industry setting
6	Bala & Venkatesh, (2013)	Job satisfaction	Onwards and upwards	Quant	Job characteristics change model (JCCM)	Field study-SAP HCM modules in two organi- zations	Operational and Managerial	Manu- facturing
7	Bala & Venkatesh, (2016)	Job satisfaction; Job performance	Onwards and upwards	Quant	NA	Field survey	Operational	Manu- facturing
8	Bala et al., (2021)	Job satisfaction; Job performance	Onwards and upwards	Quant	NA	Long. Field survey	Operational and Managerial	Manu- facturing
9	Bellini et al., (2020)	Team member performance	Onwards and upwards	Qual	NA	Field interviews- Case study	Operational	Education
10	Bhattacharya & Wamba, (2015)	Job satisfaction	Shakedown	Quant	TAM and Diffusion of Innovation	Field survey	Operational	Healthcare
11	Brattin et al., (2019)	Turnover intention	Onwards and upwards	Quant	NA	Field survey	Operational	Manu- facturing
12	Chung et al., (2014)	Job performance	Shakedown	Quant	TAM	Field survey	Operational, Managerial and Strategic	Multiple industries
13	Deng & Wang, (2014)	Performance	Onwards and upwards	Quant	NA	Field survey	Operational	Information Technology
14	Ghani et al., (2019)	Employee performance	Onwards and upwards	Quant	DeLone McLean IS Success Model	Field survey	Operational	Multiple industries (SMEs)
15	Hietala & Päivärinta, (2021)	Job satisfaction	Shakedown	Qual	NA	Field interviews- Case study	Operational and Managerial	Manu- facturing

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Sr no.	Reference	Job outcome(s)	ESs Lifecycle	Research design	Theory used	Data sample	ES Users	Industry setting
16	Hornyak et al., (2020)	Performance expectancy of new ES	Onwards and upwards	Quant	NA	Long. Field survey	Operational and Managerial	Information Technology
17	Hornyak, (2012)	Performance expectancy	Onwards and upwards	Quant	IT innovation context	Long. Field survey	Managerial	Information Technology
18	Huy et al., (2019)	Job performance	Onwards and upwards	Quant	TTF model	Field survey	Operational	Multiple industries
19	Hwang, (2005)	Intrinsic motivation	Onwards and upwards	Quant	TAM	Field survey	Operational	Multiple industries
20	Hwang, (2005)	Intrinsic motivation	Shakedown	Quant	Self-deter-mination theory and Inno-vation diffusion theory	Field survey	Operational	Information Technology
21	Jalal, (2011)	Job performance	Shakedown	Quant	NA	Field survey	Operational	NA
22	Jones et al., (2011)	Employee motivation	Shakedown	Quant	NA	Field survey	Operational	Sales and Marketing
23	Ke et al., (2012)	Intrinsic hedonic and normative motivation	Shakedown	Quant	Self-deter-mination theory-SDT	Field survey	Operational	Manu-facturing
24	Kwahk & Kim, (2008)	Organizational commitment; Performance expectancy	Shakedown	Quant	NA	Field survey	Operational and Managerial	Multiple industries
25	Liere-Netheler et al., (2017)	Job satisfaction	Onwards and upwards	Qual	Job charac-teristics model (JCM)	Field inter-views-Case study	Operational and Managerial	NA
26	Lim et al., (2005)	Performance	Onwards and upwards	Qual	Partici-pative action research (PAR)	Field inter-views-Case study	Operational and Managerial	Manu-facturing

Sr no.	Reference	Job outcome(s)	ESs Lifecycle	Research design	Theory used	Data sample	ES Users	Industry setting
27	Liu et al., (2011)	Performance evaluation; Intrinsic motivation	Onwards and upwards	Qual	TAM	Field inter-views - Case study	Operational, Managerial and Strategic	Multiple industries
28	Maier et al., (2015)	Exhaustion	Shakedown	Quant	Stressor-strain relationship	Field survey	Operational	Healthcare
29	McNally, (2007)	Job performance	Onwards and upwards	Qual	NA	Field inter-views - Case study	Operational	Banking
30	Morris & Venkatesh, (2010)	Job satisfaction	Onwards and upwards	Quant	Job characteristics model (JCM)	Field survey	Operational	Telecom-munications
31	Motwani & Sharma, (2015)	Performance	Shakedown	Quant	NA	Field survey	Operational	Manu-facturing
32	Motwani & Sharma, (2016)	Job satisfaction; Job performance	Shakedown	Quant	NA	Field survey	Operational	Manu-facturing
33	Nhi & Lam, (2020)	Individual performance	Onwards and upwards	Quant	TAM and TTF theory	Field survey	Operational	Multiple industries
34	Pai & Tu, (2011)	Performance expectancy	Onwards and upwards	Quant	UTAUT and TTF theory	Field survey	Operational	Sales and Marketing
35	Rai & Hornyak, (2013)	Job satisfaction; Job performance	Shakedown	Quant	NA	Field survey	Managerial and Strategic	Manu-facturing
36	Rajan & Baral, (2015)	Individual performance	Onwards and upwards	Quant	TAM	Field survey	Operational	Multiple industries
37	Rodriguez & Honeycutt, (2011)	Sales Performance	Onwards and upwards	Quant	NA	Field survey	Operational	Multiple industries
38	Saeed et al., (2010)	Job Performance	Shakedown	Quant	TAM	Field survey	Operational, Managerial and Strategic	Aerospace

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Sr no.	Reference	Job outcome(s)	ESs Lifecycle	Research design	Theory used	Data sample	ES Users	Industry setting
39	Sedera & Lokuge, (2019)	Individual performance	Onwards and upwards	Quant	DeLone McLean IS Success Model	Field survey	Operational, Managerial and Strategic	NA
40	Shahreki et al., (2019)	Turnover intention	Shakedown	Quant	TAM	Field survey	Operational	Human Resource
41	Shao et al., (2017)	Intrinsic motivation	Shakedown	Quant	Charismatic leadership and Intrinsic motivation theory	Field survey	Operational	Agricultural supply chain
42	Sun et al., (2009)	Individual performance	Shakedown	Quant	UTAUT	Field survey	Operational	Multiple industries
43	Sykes & Venkatesh, (2017)	Job performance	Shakedown	Quant	NA	Field survey	Operational	Telecom-munications
44	Sykes et al., (2014)	Job performance	Onwards and upwards	Quant	NA	Field survey	Operational	Telecom-munications
45	Sykes, (2015)	Job satisfaction; Job performance	Shakedown	Quant	NA	Field survey	Managerial	Manu-facturing
46	Sykes, (2020)	Job satisfaction; Job performance	Onwards and upwards	Quant	NA	Field survey	Operational	Finance and Accounting
47	Uddin et al., (2019)	Performance expectancy	Onwards and upwards	Quant	UTAUT	Field survey	Operational	Manu-facturing
48	Venkatesh & Goyal, (2022)	Job satisfaction; Job performance	Onwards and upwards	Quant	Anchoring-and-adjustment perspective	Field survey	Operational	Telecom-munications
49	Weli, (2014)	Performance	Onwards and upwards	Quant	DeLone McLean IS Success Model	Field survey	Managerial	Multiple industries
50	Yan & Yan, (2014)	Intrinsic motivation	Onwards and upwards	Quant	TAM	Field survey	Operational and Managerial	Multiple industries

Table A2. Studies selected for the Systematic Literature Review

Quality Evaluation criteria of selected studies

Sr no.	Author	QE1	QE2	QE3	QE4	QE5	QS Score
1	Aliyu & Nyadzayo, (2018)	2	2	1.5	1.5	1	8
2	Alnuaimi, (2010)	2	2	2	1	1	8
3	Andrianto,(2019)	1.5	1.5	2	2	1	8
4	Azizah et al., (2020)	2	0	1.5	1	1	5.5
5	Bala & Bhagwatwar, (2018)	2	2	2	2	1	9
6	Bala & Venkatesh, (2013)	2	2	2	2	1	9
7	Bala & Venkatesh, (2016)	2	2	2	2	1	9
8	Bala et al., (2021)	2	2	2	2	1	9
9	Bellini et al., (2020)	1.5	1.5	1.5	1.5	1	7
10	Bhattacharya & Wamba, (2015)	2	1.5	1.5	1	1	7
11	Brattin et al., (2019)	2	1.5	1.5	0	1	6
12	Chung et al., (2014)	2	1.5	2	2	1	8.5
13	Deng & Wang, (2014)	2	1.5	1.5	1.5	1	7.5
14	Ghani et al., (2019)	2	2	2	1	1	8
15	Hietala & Päivärinta, (2021)	1.5	1.5	1.5	1.5	1	7

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Sr no.	Author	QE1	QE2	QE3	QE4	QE5	QS Score
16	Hornyak et al., (2020)	2	2	2	1.5	1	8.5
17	Hornyak, (2012)	2	2	2	1	1	8
18	Huy et al., (2019)	2	2	2	1	1	8
19	Hwang, (2005)	2	2	2	2	1	9
20	Hwang, (2005)	2	1.5	1.5	1	1	7
21	Jalal, (2011)	2	2	1.5	1	1	7.5
22	Jones et al., (2011)	2	1.5	1.5	2	1	8
23	Ke et al., (2012)	2	2	1.5	2	1	8.5
24	Kwahk & Kim, (2008)	2	1.5	1.5	2	1	8
25	Liere-Netheler et al., (2017)	1.5	1.5	1.5	1	1	6.5
26	Lim et al., (2005)	1.5	1.5	2	2	1	8
27	Liu et al., (2011)	1.5	2	2	2	1	8.5
28	Maier et al., (2015)	2	1.5	1.5	1	1	7
29	McNally, (2007)	1.5	1.5	2	1.5	1	7.5
30	Morris & Venkatesh, (2010)	2	2	2	2	1	9
31	Motwani & Sharma, (2015)	2	1.5	1.5	1	1	7

Sr no.	Author	QE1	QE2	QE3	QE4	QE5	QS Score
32	Motwani & Sharma, (2016)	2	0	1.5	1	1	5.5
33	Nhi & Lam, (2020)	2	1.5	2	0	1	6.5
34	Pai & Tu, (2011)	2	1.5	1.5	2	1	8
35	Rai & Hornyak, (2013)	2	1.5	1.5	2	1	8
36	Rajan & Baral, (2015)	2	1.5	2	2	1	8.5
37	Rodriguez & Honeycutt, (2011)	2	1.5	2	2	1	8.5
38	Saeed et al., (2010)	2	2	1.5	2	1	8.5
39	Sedera & Lokuge, (2019)	2	1.5	2	1.5	1	8
40	Shahreki et al., (2019)	2	1.5	1.5	1	1	7
41	Shao et al., (2017)	2	1.5	1.5	2	1	8
42	Sun et al., (2009)	2	1.5	2	2	1	8.5
43	Sykes & Venkatesh, (2017)	2	2	2	2	1	9
44	Sykes et al., (2014)	2	2	2	2	1	9
45	Sykes, (2015)	2	2	2	2	1	9
46	Sykes, (2020)	2	2	2	2	1	9
47	Uddin et al., (2019)	2	2	1.5	1.5	1	8

Sr no.	Author	QE1	QE2	QE3	QE4	QE5	QS Score
48	Venkatesh & Goyal, (2022)	2	2	2	2	0	8
49	Weli, (2014)	2	2	1.5	1	1	7.5
50	Yan & Yan, (2014)	2	1.5	1.5	1	1	7

Table A3. Quality Evaluation criteria of selected studies

Themes and variables with references

Sr no.	Theme	Variable	Definition	Reference
1	Task characteristics	Task productivity	The extent to which an application (the enterprise system) is expected to improve the user's output per unit of time.	Saeed et al., (2010)
		Task innovation	the extent to which an application (i.e., enterprise system) is expected to help users create and try out new ideas in their work.	Saeed et al., (2010)
		Task mobility	The extent to which task performance is accomplished, along with changes in time and space.	Kakihara & Sørensen, (2002)
		Task interdependence	The degree to which organizational employees or departments should depend on other organizational members to accomplish the goal of the task.	Wageman & Baker, (1997)
		Task type	The extent to which a task is associated with different degrees of uncertainty and equivocality of information processing	Deng & Wang, (2014)
		Task complexity	The extent to which a large number of components are related.	Deng & Wang, (2014)
		Task efficiency (per-formance)	The extent to which the enterprise system enables users to undertake their tasks with the least use of resources.	Saeed et al., (2010)

Sr no.	Theme	Variable	Definition	Reference
2	Tech-nology charac-teristics	Usability	The extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.	Normung, (2006)
		Data quality	The extent to which the data provided is regarded as true, reliable and sufficiently up to date.	Pipino et al., (2002)
		Service quality	Overall support for the employees regarding the technology used. It is especially important during the implementation but also covers the time of usage.	Delone & McLean, (2003)
		Complex-ity	The extent to which an employee believes that an ES is relatively difficult to understand and use.	Bala & Venkatesh, (2013)
		Recon-figurability	The degree to which an employee believes that an ES is implemented in such a way that it supports modifications of features and functionalities in the course of its use.	Bala & Venkatesh, (2013)
		Customi-zation	The degree to which an employee believes that an ES is tailored in such a way that it closely fits with his or her needs for data, functionality, and outputs to accomplish tasks.	Bala & Venkatesh, (2013)
		Un-certainty	The extent to which the system is prone to operational problems; the more an application is prone to these, the higher its technological uncertainty.	Mullarkey et al., (1997)
		Abstract-ness	The extent to which the underlying operations and processes of the system are difficult to understand and interpret.	Mullarkey et al., (1997)

Sr no.	Theme	Variable	Definition	Reference
3	Process charac-teristics	Process complexity	The degree to which an employee believes that elements of his or her work processes (i.e., activities, information and resource requirements) are difficult to understand and act upon.	Bala & Venkatesh, (2013)
		Process rigidity	The degree to which an employee believes that elements of his or her work processes (i.e., activities, information and resource requirements) cannot be modified or circumvented during the execution of the work processes.	Bala & Venkatesh, (2013)
		Process radicalness	The extent to which an employee believes that there is a certain degree of newness in the elements of his or her work processes (i.e., activities, information and resource requirements).	Bala & Venkatesh, (2013)
		Process clarity	The individual's understanding of how and when to perform their work tasks.	Brattin et al., (2019)
		Process identity	The individual's perception of their job involves completing an identifiable aspect or stage of the business process,	Hornyak, (2012)
		Process inter-dependence	The degree to which a knowledge worker's job depends on the job of others for completion.	Morgeson & Humphrey, (2006)
		Process standards	The degree to which work process inputs, outputs and the sequencing of activities are standardized.	March, (1991)

Sr no.	Theme	Variable	Definition	Reference
4	System charac- teristics	System reliability	The degree to which features and capabilities provided by the [ERP system] are dependable.	Ayyagari et al., (2011)
		System accessibility	The degree to which a system can be accessible to its users	Azizah et al., (2020)
		System quality	The measure of the quality of the information processing system.	DeLone & McLean, (1992)
		System usefulness	The perceptions of employees on the usefulness of an [ERP system].	Maier et al., (2015)
		System complexity	The extent to which an employee perceives an [ERP system] to be relatively difficult to understand and use.	Bala & Venkatesh, (2013)
		System pace of change	The perceptions of employees on the rate of change of an [ERP system] over time.	Maier et al., (2015)
		System use	The actual use of the system.	DeLone & McLean, (1992)
		System controllability	The degree to which an individual feels that he or she has the ability and resources to deal with a new IT.	Bala & Venkatesh, (2016)

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Sr no.	Theme	Variable	Definition	Reference
5	Job characteristics	Job specifications	Human characteristics are necessary for the successful performance of a job and are derived by performing a job analysis.	Ellington et al., (2015)
		Job significance	The degree to which the job has a substantial impact on the lives or work of other people, whether in the immediate organization or the external environment.	Hackman & Oldham, (1976)
		Job autonomy	The degree to which the job provides substantial freedom, independence and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out.	Hackman & Oldham, (1976)
		Job identity	The degree to which the job requires completion of a 'whole' and identifiable piece of work; that is, doing a job from beginning to end with a visible outcome.	Hackman & Oldham, (1976)
		Skill variety	The degree to which a job requires a variety of different activities in carrying out the work, which involves the use of several different skills and talents of the person.	Hackman & Oldham, (1976)
		Feedback	The degree to which carrying out the work activities required by the job results in the individual obtaining direct and clear information about the effectiveness of his or her performance.	Hackman & Oldham, (1976)
		Job demand	The degree to which an employee perceives that he or she is required to work fast and hard, and has much work to do, often in a short time.	Karasek, (1979)
		Job control	The degree to which an employee perceives that he or she can exert some influence over his or her work environment concerning the method, timing, and boundary of his or her work.	Ganster & Fusilier, (1989)
		Job security	The degree to which the employee perceives losing his/her job shortly.	Clark & Postel-Vinay, (2009)
		Job anxiety	Job anxiety is defined as a feeling of fear and/or an apprehensive mental state of an employee regarding certain components of work.	Srivastava, (1977)
		Job stress	Job stress is defined as the feeling of a person who is required to deviate from normal or self-desired functioning in the workplace as a result of the opportunities, constraints or demands relating to potentially important work-related outcomes	Janssen, (2004)
		Job scope	The degree of richness, challenge, and complexity inherent in a job that an employee perceives.	Raja & Johns, (2010)
		Job discretion	The level of personal influence or discretion over the tasks that employees do in their jobs.	Green, (2008)
		Job difficulty	Job difficulty is defined as a job activity that requires significant physical and/or mental effort to complete.	IVANCEVICH et al., (1981)

Sr no.	Theme	Variable	Definition	Reference
6	Net-working	Psychological safety climate	It is defined as a shared belief held by members that the team is safe for interpersonal risk-taking.	Edmondson, (1999)
		Get/give advice (formal-informal)	Workplace advice networks comprise employees in a defined workplace setting (e.g., business unit) who seek and provide information, assistance, and expert knowledge to and from one another to perform their jobs.	Sparrowe et al., (2001)
		Traditional support systems	To aid employees in coping with new ES implementations.	Sykes, (2015)

Table A4. Themes and variables with references

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Association of thematic foci—ESs lifecycle and job outcomes

Thematic foci	ESs lifecycle phases				Positive job outcomes					Negative job outcomes		
	Project charting	Project con-figuration	Shakedown	On-wards and up-wards	Job perfor-mance	Job satis-fac-tion	Com-mit-ment	In-trinsic motiv-ation	Low absen-teeism	Turn-over inten-tion	Emo-tional exhau√-tion	Work with-draw-al
Task charac-teristics				√	√							
Tech-nology charac-teristics			√	√	√	√	√	√		√		
Process charac-teristics			√	√	√	√				√		
System charac-teristics			√	√	√	√	√			√	√	
Job charac-teristics			√	√	√	√	√	√			√	
Net-working			√	√	√	√		√				

Table A5. Association of thematic foci—ESs lifecycle and job outcomes

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Potential future research agenda—thematic foci

Research theme	Potential Research Questions
Thematic foci I: Task characteristics	**RQ1:** How do the task characteristics of on-premise and cloud ESs differ? If any difference exists, how did they evolve in terms of their impact on employee job outcomes and through the ESs lifecycle?
	RQ2: What impact does the shift to cloud ESs have on task productivity and task innovation? How do they affect job outcomes with a focus, especially on negative outcomes?
	RQ3: What role does organizational culture play in this shift towards cloud and its implications on task characteristics?
Thematic foci II: Technology characteristics	**RQ1:** How did the technology characteristics change with a shift towards cloud ESs solutions? What are the nuances that will emerge out of this shift and how do they impact the employee perceptions and their job outcomes?
	RQ2: How do organizations embrace the shift in technological characteristics and prepare employees to embrace these changes compared to on-premise systems?
	RQ3: What's the role of top management in transitioning to cloud ESs and how does it affect the businesses as an organizational unit?
Thematic foci III: Process characteristics	**RQ1:** How do work process characteristics evolve from proactive (knowledge-based) perspectives to relational (collaborative and connected) work designs? What implications does this shift in work designs have on job outcomes?
	RQ2: What process changes do cloud ESs bring into work process characteristics of businesses and how do they impact the daily routine tasks of employees with a subsequent impact on their job outcomes?
	RQ3: What role does team-level phenomenon have on the relationship between process characteristics and job outcomes?

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Research theme	Potential Research Questions
Thematic foci IV: System character-istics	**RQ1:** With organizations moving towards cloud ESs, it becomes important to know how system characteristics change from on-premise ESs. And how do they impact employee job outcomes?
	RQ2: How does the significance of system characteristics evolve (from on-premise to the cloud) and what implications does it have on employee job outcomes?
Thematic foci V: Job characteristics	**RQ1:** What job characteristics are dynamic and which of them remain static over ESs implementation (shakedown phase, onwards and upwards phase)? And how do they impact employee job outcomes at different stages of the ESs lifecycle?
	RQ2: How does the change in work design from dynamic and knowledge-based to collaborative and connected impact job characteristics for the contemporary ESs implementation and their subsequent effect on employee job outcomes? Did this shift create any dissonance in the perceptions of job characteristics which may evoke negative job outcomes subsequently leading to looking for workarounds or possible ESs abandonment?
	RQ3: Do the job characteristics of on-premise ESs and cloud ESs differ? If the difference exists, then how does this impact employee job outcomes? And how do employees perceive the similarities and differences between both systems in terms of various job characteristic perspectives?
Thematic foci VI: Networking	**RQ1:** How do different types of social networks such as communication and friendship networks impact employee job outcomes? Will they essentially evoke only positive outcomes?
	RQ2: What resources (e.g., organizational support, peer advice networks) help employees form strong network ties (e.g., content, source) to better understand the ESs to enhance their job outcomes? Do these resources serve as enablers or hindrances to achieving their job outcomes (both positive and negative)?
	RQ3: How do relational coordination dimensions (shared goals, shared knowledge, mutual respect) impact networking? How does the evolution of these elements affect job outcomes?

Table A6. Potential future research agenda—thematic foci

Potential future research agenda

Sr no.	Potential Research Questions
1	How do various challenge-hindrance stressors influence employee job outcomes? What negative job outcomes would they trigger post-implementation?
2	Does ESs implementation cause dissonance in work routines in employee's post-implementation? How does the cognitive-dissonance theory contribute to the nuanced understanding of this phenomenon?
3	Does ESs implementation create similar job outcomes in different industry settings? If yes, how does it differ from industry to industry? What cautions should organizations take when extrapolating the findings of one industry to different industry?
4	How do job outcomes vary over different ESs lifecycles? What implications do they have on the organization's daily work routines?
5	What are the short-run and long-run effects of ESs implementation on employee job outcomes?
6	How do team-level phenomena such as team psychological safety or implicit coordination or team knowledge sharing impact individual-level phenomena and their impact on job outcomes?
7	What implications does cloud ESs implementation have on employee job outcomes compared to on-premise ESs? Are they perceived the same? If no, what differences would impact the outcomes more and how?
8	How does the disruption caused by ESs implementation perceived by employees and what impact does it have on negative job outcomes? Is the impact short-term or long-term and what implications does it have on employee work routines?
9	How does the end-users interaction with the ESs change in the cloud environments especially given the accessibility and mobility of the new user interfaces that have changed from office PCs to personal laptops, tablets and smartphones? What impact does this have on employee job outcomes?

Table A7. Potential future research agenda

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