



Overcoming the Challenges of Enterprise Resource Planning (ERP): A Systematic Review Approach

Godwin Banafo Akrong, University of Electronic Science and Technology of China, China*

 <https://orcid.org/0000-0002-2822-2284>

Yunfei Shao, University of Electronic Science and Technology of China, China

Ebenezer Owusu, University of Ghana, Ghana

 <https://orcid.org/0000-0002-4670-1342>

ABSTRACT

The study presents the results of a comprehensive review conducted between 2005-2020 to identify enterprise resource planning (ERP) challenges, discover the divisions in which these challenges can be clustered, and provide general strategies to resolve these challenges. The study also found 25 categories that can be classified into ERP challenges. Sixty-five ERP challenges were identified based on the reviewed literature, of which 18 were not provided with adequate solutions as to how to resolve them, and the related solutions as mentioned in the reviewed literature are presented in-depth. The result will help both academics and practitioners involved with how to resolve ERP system challenges.

KEYWORDS

Enterprise Resource Planning, ERP Challenges, Implementation of ERP, Project Management

INTRODUCTION

Due to the extreme difficulty of certain organizational activities, firms have embraced the usage of enterprise resource planning systems (ERP) for decades. According to Beheshti and Beheshti (2010), an ERP is an information system (IS) that combines business functions to generate value and lower costs by providing the right information to the right people at the right time, allowing them to make the best decisions to manage an organization's capital constructively and efficiently (Costa et al., 2016; Shaul & Tauber, 2013; Catherine & Abdurachman, 2018). The factors obstructing ERP deployment are more prevalent in developing countries, as ERP systems are implemented and planned using more advanced technologies. ERP, according to several scholars, improves asset tracking, advocates resource adaptability, provides information to aid decision-making, and improves accountability and uniformity (Bramantoro, 2018; Fadelelmoula, 2018; Sriram et al., 2018; Trinoverly et al., 2018; Welu, 2019). It also helps departments integrate tasks, reduces financial reporting times, boosts output

DOI: 10.4018/IJEIS.306242

*Corresponding Author

This article published as an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and production in any medium, provided the author of the original work and original publication source are properly credited.

and productivity, streamlines operations, and reorganizes the workforce (AboAbdo et al., 2019; Bramantoro, 2018; Kulikov et al., 2020; Welj, 2019).

However, over time, companies' expenditures on implementing ERPs have proven to be costly, complicated, and time-consuming for most businesses, resulting in a lack of value for the deployed ERP system (Chofreh et al., 2020; Lozano & BayonaOré, 2017; Mahraz et al., 2020). According to Lozano and BayonaOré (2017), the aspects that tend to overcome the aforementioned issues include effective project management, well-defined priorities from the outset, and proper preparation of work teams. Surprisingly, due to the significant maintenance costs associated with ERP packages, only large-scale organizations are always able to manage them after decades (AlBar & Hoque, 2019; Mahraz et al., 2018; Mayeh et al., 2016). In addition to the popularity of ERP use, Prasetyo et al. (2019) report that the failure rate is exceptionally high. They contended that ERP implementation failure rates varied from 67% to 90% and that current research focuses on Critical Success Factors (CSF) rather than challenges/failure factors. According to their findings, about 6% of actively authored articles cover CSF, with less than 1% addressing the challenges. This implies that, while there is a large and nuanced literature on ERP, a deeper understanding of its shortcomings in the application and the need for a single source of information is required. As practitioners and researchers, they will utilize it as a starting point to get a deeper understanding of the existence and potential causes of ERP implementation failures, as well as how to reduce them to increase the likelihood of effective future implementation.

Wijaya et al. (2018) conducted a study to identify problems and make recommendations for factors impacting ERP implementation progress to avoid recurrence of the same problem in the future. They discovered that change management factors are extremely important in the successful implementation of ERP, with project leadership (87%), rollout (83%), end-user training (70%), end-user communications (53%), and end-user engagement (50%) being the most important, and only about 20% indicating that the cultural factor influences implementation progress. Few studies have focused on offering a general plan that can direct practitioners to combine resource planning systems for a profitable firm (Chofreh et al., 2020). Their study addressed this gap by developing comprehensive guidance outlining ERP management best practices and events. The guidelines were created utilizing a conceptual research process that focuses on conducting a literature review to identify and incorporate several principles, such as aspects of development, project management, corporate judgment, and strategic management. According to their findings, ERP implementation failure is caused by a lack of preparation, a lack of capital, and a lack of engagement.

Manufacturing organizations are investing a lot of money and time to deploy ERP, according to Sar and Garg (2019), in the hopes of increasing job productivity after implementation. In most cases, however, ERP implementation results in a high failure rate. Their findings also confirmed the assumption that the majority of ERP implementation studies focused on critical success factors (CSF), with only a few addressing issues like performance indicators, ERP benefits, reasons for successful adoption, and failures. As a result, they suggest a conceptual structural model for ERP adoption in the automobile industry that is both efficient and effective. In defining the most common challenges associated with the execution of an information system, Figueroa-Flores et al. (2020) confirmed that some of the most important factors were inadequate management, weak project definition, and inadequate consultation. According to Phaphoom et al. (2018a), poorly structured organizational procedures, lack of transparency on change, change management, communications issues, and inadequate project management are all factors that contribute to implementation failures.

When ERP challenges are measured, it is evident that firms pay insufficient attention to the ERP's preparedness and rush to implementation (Kirmizi & Kocaoglu, 2020). This indicates that the ERP literature falls short in describing how and by what tool a company's ERP preparation evaluation is conducted, as well as how to address the implementation challenges. The current study utilized a structured literature review technique similar to that of Esteves and Bohorquez (2007) to present a

comprehensive evaluation of the ERP challenges, their categorization, and methods for resolving the ERP challenges, with an emphasis on all phases of implementation.

The current study aims to establish how the challenges associated with ERP implementation can be overcome. Secondly, to contribute to future research on ERP challenges, and thirdly, to present and examine how practitioners and scholars might use these findings to develop a practical solution to the identified challenges. The study also discovered a discrepancy in current studies. Few studies have focused on recommending a general strategy for practitioners to use while implementing an ERP. The majority of studies focused on the critical success factors (CSF) for ERP implementation, with only a few addressing failure measures, performance metrics, ERP benefits, and the elements that determine whether or not an ERP implementation is successful. There is also a gap in the literature about the ERP system's pre-and post-installation phases, with most studies focusing solely on the implementation phase.

The remainder of the article is as follows: Section 2 details the methodology. Section 3 covers the importance of ERP, whereas Section 4 discusses the challenges associated with ERP. Section 5 discusses how to overcome ERP challenges. Section 6 provides an analysis and discussion, while Section 7 contains the conclusion.

METHODOLOGY

The study uses a comprehensive literature review process from Esteves and Bohorquez (2007) to find how to tackle the challenges of implementing ERP. Second, the present study addresses many ERP challenges, and how practitioners and scholars might use the findings to better address the challenges. Fig. 1 depicts the research method stages of the three-step structural context.

Step 1: Search Database for Research on ERP

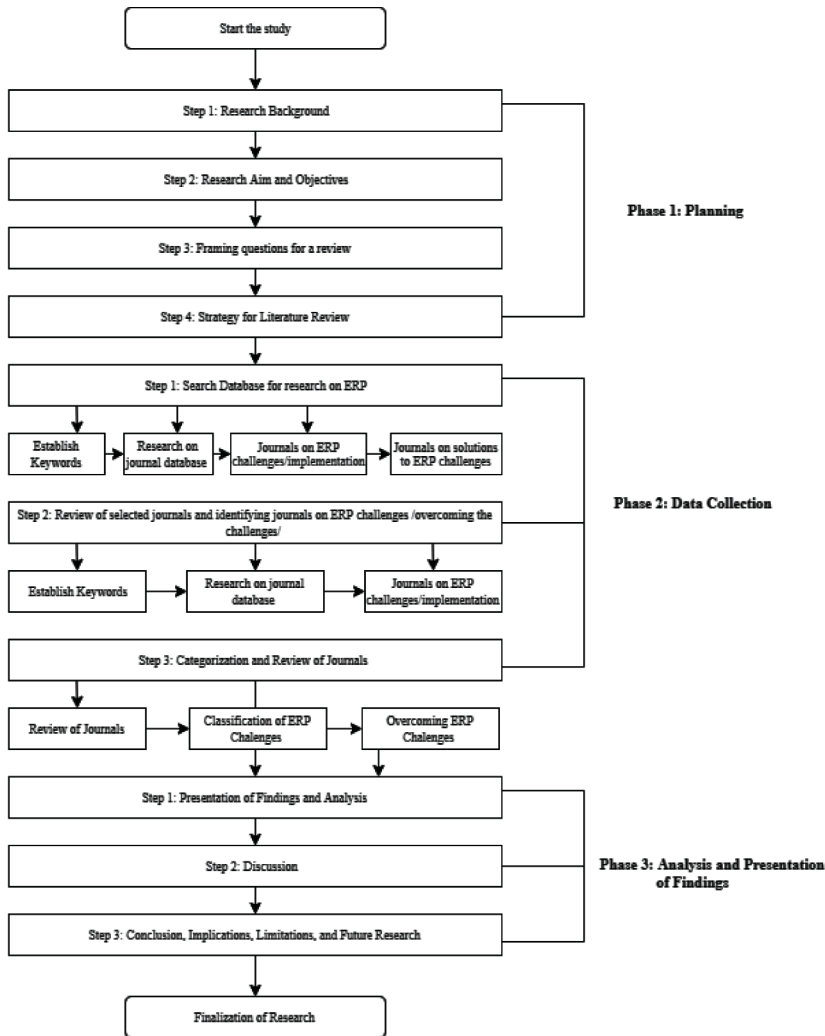
The methodology begins with the formation of keywords that might be used to search for topics related to ERP challenges. ERP, ERP implementation method, problems, theories, significance, and issues are the keywords. Following that, the keywords were utilized to search for journal articles and conference papers. It excluded books and web posts based on the keywords listed above. SCOPUS, Science Direct, Emerald, Taylor & Francis, and Internet search engines like Google Scholar were utilized to find these articles. Although Google Scholar provided a greater number of articles during the initial search stages, it was excluded because the bulk of the studies was published in predatory journals and thus was not appropriate for this study. This is because the quality of articles published in predatory journals is unknown, as the majority is not peer-reviewed. Additionally, it was discovered that the majority of high-quality papers listed in Google Scholar were also available in the Scopus database. In the initial search, 668 scholarly papers about ERP were identified using the keywords.

Step 2: Reviewing of Literature and Selecting Journals on ERP

Using ERP search keywords such as ERP implementation process, obstacles, theories, significance, by ERP implementation concerns articles between 2005 and 2020, the study focuses on identifying the challenges affecting ERP and understanding how to address the problems associated with ERP implementation. The current review contained the most recent literature, as a consequence of which 626 research papers were excluded because they were not directly related to ERP challenges, approaches to address the challenges, or was from a pre-study period (see Fig. 2).

Following this filtering approach, a sample of 42 published research papers that satisfy the study's requirements has been identified for the literature review (see Table 1). The review process is based on the abstracts, research findings, keywords, and research recommendations of research articles, which help to understand ERP challenges and how to address them.

Figure 1. Methodological framework for review of the literature



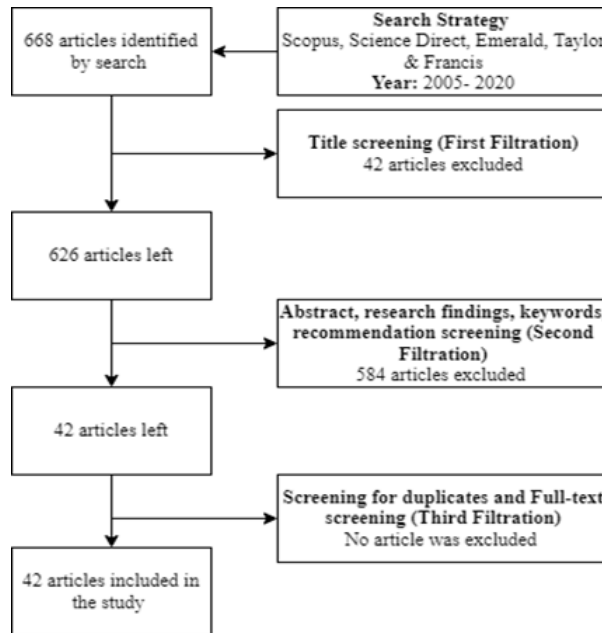
The study areas examined in the publications are shown in Fig. 3. The majority of the areas centered on ERP systems, critical ERP failure causes, and ERP implementation.

RESULTS AND DISCUSSION

Categorization and Review of Journals

The study employed Esteves and Bohorquez (2007) systematic literature review technique, which included an extensive and detailed review of each research paper’s abstract. It was time-consuming, and the researchers spent at least 35-50 minutes on each adapted article. This was done to aid the researchers in their understanding of the study’s concept, approach, and results. The arbitrary nature of journal categorization prompted the adoption of content analysis. According to Renz et al. (2018), content review increases categorization while also increasing awareness and interpretation of the current study. This also helps with research because it encourages the gathering of journals on the

Figure 2. Stages in Study Selection



same subject, which helps with referencing, comparing, and observations. Fig. 4 shows the number of selected articles published each year.

The papers selected for the analysis were published between 2005 and 2020, while the majority of those in Figure 4 were published in 2016, 2017, 2018, and 2019. This shows that ERP publications are becoming obsolete over time.

The distribution of studies by country/region is also shown in Fig. 5. The majority of papers did not specifically specify or include the country/region of the study, as the majority of the publications evaluated were literature articles. However, Iran, India, Saudi Arabia, Malaysia, and the United Nations accounted for the majority of the recorded ERP failures.

The distribution of studies by research methodology was also presented in Fig. 6. Literature review, case analysis, and survey were the most common research methods employed in the articles analyzed. Interviews were employed in only a few articles, while other studies did not specify the approach used. A few additional papers used two procedures, such as literature review and interview, survey and interview, and observations and interview.

MAPPING OF CHALLENGES AND ERP CATEGORIES

A total of 42 papers were analyzed for this study, with 15 of them categorizing the challenges associated with ERP implementation into distinct categories (see Table 2). In general, 25 groups have been identified, with project management (13.2%), organization (13.2%), and technology & provider (10.5%). Employee/personnel/human resources accounted for 7.9% of the total, followed by technical/architecture (7.9%), individual/end-user (5.3%), and strategic, operational/business, management engagement, and process (3.9%). Table 2 shows how the remaining percentage was distributed among the remaining categories.

Table 3a and Table 3b shows a mapping of challenges based on the literature review. The analysis identified 65 challenges in the 42 articles that were reviewed.

Table 1. Articles reviewed

#	Author(s)	Title	Year	Journal
1	Gargeya, V. B., & Brady, C.	Success and failure factors of adopting SAP in ERP system implementation	2005	Business Process Management Journal
2	Tsai, W. H., Chien, S. W., Hsu, P. Y., & Leu, J. D.	Identification of critical failure factors in the implementation of enterprise resource planning (ERP) system in Taiwan's industries	2005	International Journal of Management and Enterprise Development
3	Wong, A., Scarbrough, H., Chau, P., & Davison, R.	Critical failure factors in ERP implementation	2005	9th Pacific Asia Conference on Information Systems: I.T. and Value Creation, PACIS
4	Bingi, P., Sharma, M. K., & Godla, J. K.	Critical Issues Affecting an ERP Implementation	2006	Information Systems Management
5	Kholeif, A.O.R., Abdel-Kader, M. and Sherer, M.	ERP Customization Failure: Institutionalized Accounting Practices, Power Relations and Market Forces	2007	Journal of Accounting & Organizational Change
6	Pan, S. L., Newell, S., Huang, J., & Galliers, R. D.	Overcoming knowledge management challenges during ERP implementation: The need to integrate and share different types of knowledge	2007	Journal of the American Society for Information Science and Technology
7	Pan, G., Hackney, R., & Pan, S. L.	Information Systems implementation failure: Insights from prism	2008	International Journal of Information Management
8	Noudoostbeni, A., Yasin, N. M., & Jenatabadi, H. S.	To investigate the success and failure factors of ERP implementation within Malaysian small and medium enterprises	2009	Proceedings - 2009 International Conference on Information Management and Engineering (ICIME) IEEE
9	Garg, P.	Critical Failure Factors for Enterprise Resource Planning Implementations in Indian Retail Organizations: An Exploratory Study	2010	Journal of Information Technology Impact
10	Ganesh, L., & Mehta, A.	A Survey Instrument for Identification of the Critical Failure Factors in the Failure of ERP Implementation at Indian SMEs	2010	International Journal of Managing Public Sector Information and Communication Technologies (JMPICT)
11	Ganesh, L., & Mehta, A.	Critical Failure Factors in Enterprise Resource Planning Implementation at Indian SMEs	2010	Asian Journal of Management Research
12	Jharkharia, S.	Interrelations of Critical Failure Factors in ERP Implementation: An ISM-based Analysis	2011	3rd International Conference on Advanced Management Science
13	Amid, A., Moalagh, M., & Ravasan, A. Z.	Identification and classification of ERP critical failure factors in Iranian industries	2012	Information Systems
14	Sar, A. & Garg, P.	Analysis of critical failure factors in ERP implementation: An Indian experience	2012	International Journal of Business Information Systems
15	Basu, R., & Biswas, D.	An Approach to Identify Failure Factors of Enterprise Application Implementation in Indian Micro Enterprises	2013	International Journal of Managing Value and Supply Chains
16	Garg, P. & Garg, A.	An empirical study on critical failure factors for enterprise resource planning implementation in Indian retail sector	2013	Business Process Management Journal
17	Albliwi, S., Antony, J., Lim, S. A. H., & van der Wiele, T.	Critical failure factors of lean Six Sigma: A systematic literature review	2014	International Journal of Quality and Reliability Management
18	Peci, M., & Važan, P.	The Biggest Critical Failure Factors in ERP Implementation	2014	Applied Mechanics and Materials
19	Ravasan, A. Z., & Mansouri, T.	A FCM-based dynamic modeling of ERP implementation critical failure factors	2014	International Journal of Enterprise Information Systems (IJEIS)

continued on following page

Table 1. Continued

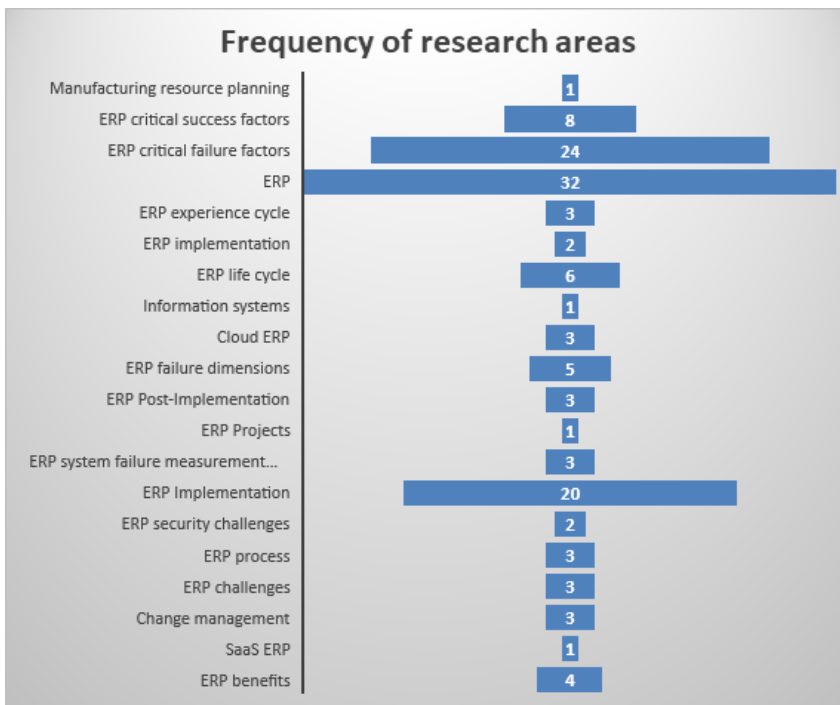
#	Author(s)	Title	Year	Journal
20	Motiei, M., Zakaria, N. H., Aloini, D., & Sekeh, M. A.	Developing instruments for enterprise resources planning (ERP) post-implementation failure model.	2015	International Journal of Enterprise Information Systems (IJEIS)
21	Umar, M., Khan, N., Agha, M. H., & Abbas, M.	Exploring the Factors Affecting ERP Implementation Quality	2016	Journal of Quality and Technology Management
22	Ebad, S. A.	Influencing Factors for IT Software Project Failures in Developing Countries — A Critical Literature Survey	2016	Journal of Software
23	Zare Ravasan, A., & Mansouri, T.	A dynamic ERP critical failure factors modelling with FCM throughout project lifecycle phases	2016	Production Planning and Control
24	Chakravorty, S. S., Dulaney, R. E., & Franza, R. M.	ERP implementation failures: A case study and analysis	2016	International Journal of Business Information Systems
25	Narayanamurthy, G., & Gurumurthy, A.	Revisiting the critical failure factors of ERP to explore their relationships - An ISM based approach	2017	International Journal of Manufacturing Technology and Management
26	Garg, P., & Khurana, R.	Applying structural equation model to study the critical risks in ERP implementation in Indian retail	2017	Benchmarking: An International Journal.
27	Saadé, R. G., Nijher, H., & Sharma, M.	Why ERP Implementations Fail – A Grounded Research Study	2017	Proceedings of the Informing Science and Information Technology Education Conference
28	Rahmanimesh, M., Shafiei Nikabadi, M., Pourkarim, F., & Davoodifar, G.	Using fuzzy flowsort inference system to rank the factors leading to failure for ERP projects among Iranian enterprises	2017	Journal of Information Technology Management
29	Gabryelczyk, R., & Roztocki, N.	Effects of BPM on ERP Adoption in the Public Sector.	2017	Americas Conference on Information Systems (AMCIS)
30	ChePa, N., & Jasin, N. M.	A prevention model for the failure of hospital information systems in Malaysian government hospitals	2018	Journal of Telecommunication, Electronic and Computer Engineering (JTEC)
31	Aranyossy, M., Blaskovics, B., & Horváth, A. A.	How universal are IT project success and failure factors? Evidence from Hungary	2018	Information Systems Management
32	Khanfar, A. A., Mavi, R. K., & Jie, F.	Prioritizing critical failure factors of IT projects with fuzzy analytic hierarchy process	2018	AIP Conference Proceedings
33	Sreedharan, V. R., Gopikumar, V., Nair, S., Chakraborty, A., & Antony, J.	Assessment of critical failure factors (CFFs) of Lean Six Sigma in real life scenario: Evidence from manufacturing and service industries	2018	Benchmarking
34	Mahmood, F., Khan, A. Z., & Bokhari, R. H.	ERP issues and challenges: a research synthesis	2019	Kybernetes
35	Kohansal, M. A.	Lessons from failure ERP implementations	2019	Norsk konferanse for organisasjoners bruk av IT
36	Prasetyo, S. J., Lubis, M., Witjaksono, R. W., & Azizah, A. H.	Critical Failure Factors in Enterprise Resource Planning (ERP) Implementation: Case Study of PT. Toyota Astra Motor Indonesia	2019	2019 Fourth International Conference on Informatics and Computing (ICIC)
37	Menon, S. A., Muchnick, M., Butler, C., & Pizur, T.	Critical Challenges in Enterprise Resource Planning (ERP) Implementation	2019	International Journal of Business and Management
38	Virzi, K.	Examining the Success and Failure Factors of Business Process Reengineering in Africa, Asia, the Middle East, and North America: A Literature Review	2019	Open Access Library Journal
39	AlBar, A. M., & Hoque, M. R.	Factors affecting cloud ERP adoption in Saudi Arabia: An empirical study	2019	Information Development

continued on following page

Table 1. Continued

#	Author(s)	Title	Year	Journal
40	Sancar Gozukara, S., Tekinerdogan, B., & Catal, C.	Obstacles of On-Premise Enterprise Resource Planning Systems and Solution Directions	2020	Journal of Computer Information Systems
41	Morrisson, M. K.	Best Practice Models for Enterprise Resource Planning Implementation and Security Challenges	2020	Journal of Business and Management Sciences
42	Kheybari, S., Rezaie, F. M., Naji, S. A., Javdanmehr, M., & Rezaei, J.	Evaluation of factors contributing to the failure of information systems in public universities: The case of Iran	2020	Information Systems

Figure 3. Research areas investigated in publications



IMPORTANCE OF ERP

Enterprise resource planning (ERP) has played a critical role in the effective execution of businesses all over the world for decades. ERP is a crucial operating mechanism in the day-to-day operations of businesses, and the benefits received from ERP systems vary from one company to another. Recent theoretical advances, on the other hand, have demonstrated that many common benefits persist throughout time. According to Weli (2019), ERP benefits start with IT infrastructure, then go on to operational, organizational, and finally management benefits. This contradicts Spathis and Ananiadis (2005) claim that management advantages come first, followed by organizational and IT infrastructure. Data sensitivity is becoming increasingly important to businesses today, as they appear to benefit from data reporting as exposure for companies who successfully use ERP platforms. This is made possible by obtaining real-time information from enterprises and guaranteeing regulatory

Figure 4. Number of selected papers to published years

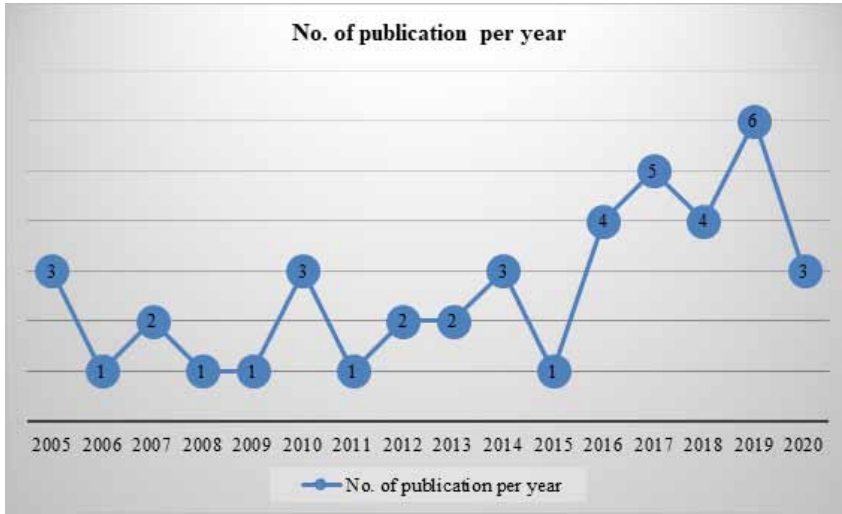
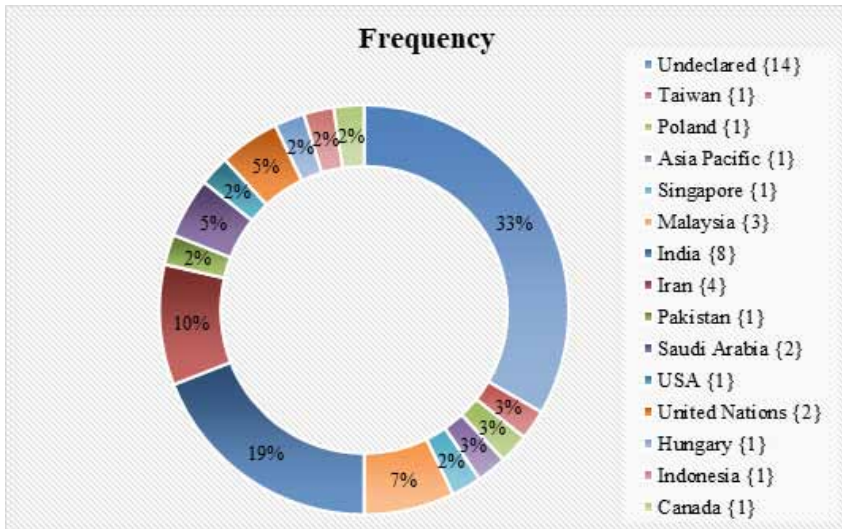


Figure 5. Distribution of studies by Country/Region



compliance (Fadelelmoula, 2018). According to Sriram et al. (2018), many organizations use ERP solutions for this purpose. An ERP system also provides organizational performance benefits that help a company’s competitiveness and performance change (Kulikov et al., 2020; Mahraz et al., 2018). This reduces organizational and labor costs; optimizes inventory volumes, eliminates silos, and streamlines operations (Badewi et al., 2018; Trinoverly et al., 2018). Identifying process improvements and reviewing primary success measures will also help businesses increase productivity (AboAbdo, 2019).

Al-Fawaz et al. (2010) and Bramantoro (2018) research further shows that ERP programs assist firms that successfully implement them in terms of development and competitiveness. This results in

Figure 6. Distribution of studies by research methods

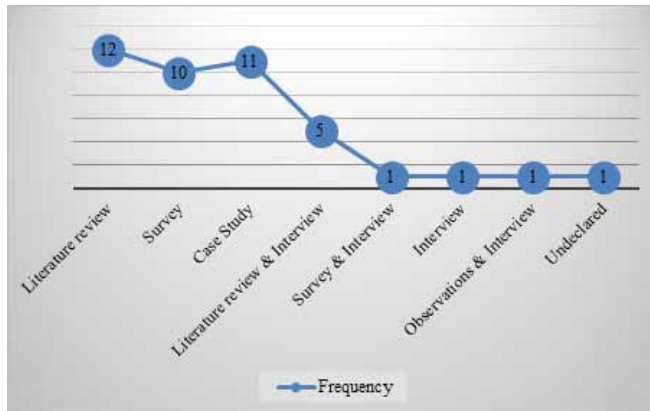


Table 2. Categories of ERP challenges

#	Categories	A	B	C	D	E	F	G	H	I	L	K	L	M	N	O	Frequency	%
1	Project management	*		*	*	*		*	*	*	*	*				*	10	13.2
2	Organizational				*			*	*	*	*	*	*	*	*	*	10	13.2
3	Technology & Vendor	*		*	*		*		*	*			*	*			8	10.5
4	Technical/Architecture				*			*		*		*			*	*	6	7.9
5	Employee/personnel/HR		*	*						*		*	*			*	6	7.9
6	People /End-User						*	*	*		*						4	5.3
7	Strategic		*	*			*										3	3.9
8	Operational/business		*				*								*		3	3.9
9	Management commitment					*				*		*					3	3.9
10	Process					*				*					*		3	3.9
11	Planning	*									*						2	2.6
12	ERP package selection	*				*											2	2.6
13	Tactical		*				*										2	2.6
14	Performance			*					*								2	2.6
15	Cost					*	*										2	2.6
16	Time frame	*															1	1.3
17	Training and education	*															1	1.3
18	Communication	*															1	1.3
19	System integration	*															1	1.3
20	System testing	*															1	1.3
21	Leadership	*															1	1.3
22	Quality			*													1	1.3
23	Enterprise			*													1	1.3
24	Project team										*						1	1.3
25	Environmental													*			1	1.3
	Grand Total																76	100

A. Tsai et al. (2005)* B. Garg (2010)* C. Ganesh and Mehta (2010)* D. Amid et al. (2012)* E. Sar and Garg (2012)* F. Garg and Garg (2013)* G. Ebad (2016)* H. Garg and Khurana (2017)* I. Rahmanimanesh et al (2017)* J. Khanfar et al. (2018)* K. Mahmood et al. (2019)* L. Menon et al. (2019)* M. AlBar and Hoque (2019)* N. Sançar et al. (2020)* O. Kheybari et al. (2020)*

Table 3a. Mapping challenges based on literature

#	Challenges	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1.	Lack of appropriate culture	+							+									+		+												
2.		+							+																							
3.	Underspecified timeline and budget		+						+																	+						
4.	Lack of IT expertise		+																													
5.	Poor IT infrastructure		+	+																												
6.	ERP systems with complex integration & structure		+	+																												
7.	Inadequate allocation and training for users		+		+																											
8.	Lack of user awareness and system training		+																													
9.	Overly complex, inflexible ERP program with manual interfaces		+																													
10.	User's resistance to change		+	+																												
11.	Poor quality of testing		+	+																												
12.	Lack of top management support		+	+	+																											
13.	Lack of senior leadership		+																													
14.	Lack of recognition of change management		+																													
15.	High turnover rate of project team members			+																												
16.	Over reliance on heavy communication		+																													

continued on following page

Table 3a. Continued

#	Challenges	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
17.	Poor customer effectiveness			+	+					+	+	+											+										
18.	Poor knowledge transfer			+			+			+	+	+		+	+	+	+		+	+				+									
19.	Perception of ERP			+	+						+	+		+	+	+	+						+	+									
20.	IT budget project schedule			+						+	+	+			+		+																
21.	Unable to identify return on investment			+							+	+	+	+	+	+																	
22.	Overly high expectations from company project			+							+	+	+	+	+	+	+						+										
23.	Change in business goals during project								+																			+					
24.	Realign resources								+																			+					
25.	Timeline and IT Project									+					+																		
26.	Poor user involvement										+			+	+								+	+			+	+			+		
27.	Insufficient resources										+						+	+						+									
28.	Business data									+				+	+		+							+			+	+					
29.	Overproject management effectiveness										+	+	+	+	+	+	+						+								+		
30.	Functionality problems with the system										+	+	+	+	+	+	+																
31.	Software modifications										+	+	+																				
32.	Initial strategy										+	+	+																				

continued on following page

Table 3a. Continued

#	Challenges	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
33.	Part-time activities													*																		
34.	Excesses of internal programs													*								*										
35.	Conflicts between constraints													*	*								*	*								
36.	Conflicts between R & work													*	*					*								*				
37.	Frequent change in staff members													*																		
38.	Government resistance to the organization													*									*									
39.	High employee's average age													*																		
40.	High inflexible													*																		
41.	High system complexity													*																		*
42.	Internal conflicts between departments													*	*						*	*		*	*							
43.	Key user replacements affect user training													*								*										
44.	No flexibility														*																	
45.	Unstable ERP product														*	*				*	*		*	*								
46.	Incomplete ERP rollout and integration														*	*				*	*		*	*								*
47.	Wrong ERP product selection														*	*				*	*		*	*								*

continued on following page

Table 3a. Continued

#	Challenges	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
48.	Unethical B2B															+		+															
49.	Peer rating															+	+	+		+									+	+			
50.	High number of non-members																+	+		+													
51.	Inappropriate timing of review																	+	+										+				
52.	Unavailability of employees during working hours																	+	+														
53.	Inappropriate background knowledge																	+	+														
54.	Peer assessment disagreement																	+	+										+				
55.	Performance of employees in a system																					+											
56.	Scalability/ flexibility																						+		+								+
57.	Conflict of interest																													+			
58.	Lack of user support																													+			+
59.	Unprofessional project manager																													+		+	
60.	Personal interests of individuals																																
61.	Weak commitment of project team																																
62.	Organization policies																																
63.	Lack of communication approach																																
64.	Peer of his or her																																
65.	Multiple additional responsibilities																																

1. Gargeya & Brady (2005)* 2. Tsai et al. (2005)* 3. Wong et al. (2005)* 4. Bingi et al. (2006)* 5. Kholeif (2007)* 6. Pan et al. (2007)* 7. Pan et al. (2008)* 8. Noudoostbeni et al. (2009)* 9. Garg (2010)* 10. Ganesh & Mehta (2010a)* 11. Ganesh & Mehta (2010b)* 12. Jharkharia (2011)* 13. Amid et al. (2012)* 14. Sar & Garg (2012)* 15. Basu & Biswas (2013)* 16. Garg & Garg (2013)* 17. Albliwi et al. (2014)* 18. Peci & Važan (2014)* 19. Ravasan & Mansouri (2014)* 20. Motiei et al. (2015)* 21. Umar et al. (2016)* 22. Ebad (2016)* 23. Zare Ravasan & Mansouri (2016)* 24. Chakravorty et al. (2016)* 25. Narayana-murthy & Gurumurthy (2017)* 26. Garg & Khurana (2017)* 27. Saadé et al. (2017)* 28. Rahmanimanesh et al. (2017)* 29. Gabryelczyk & Roztock (2017)* 30. ChePa & Jasin (2018)* 31. Aranyosy et al. (2018)* 32. Khanfar et al. (2018)* 33. Sreedharan et al. (2018)* 34. Mahmood (2019)* 35. Kohansal (2019)* 36. Prasetyo et al. (2019)* 37. Menon et al. (2019)* 38. Virzi (2019)* 39. AlBar & Hoque (2019)* 40. Sancar Gozukara et al. (2020)* 41. Morrisson (2020)* 42. Kheybari et al. (2020)*

Table 3b. Mapping challenges based on literature (Cont.)

#	Challenges	31	32	33	34	35	36	37	38	39	40	41	42	Grand Total	%
1.	Lack of appropriate culture			*	*			*		*				9	1.7
2.	Lack of organizational readiness					*		*						8	1.6
3.	Underestimated timeline and budget	*	*	*	*		*	*			*			19	3.7
4.	Lack of IT expertise	*		*	*	*	*	*		*	*	*		18	3.5
5.	Poor IT infrastructure			*	*			*		*			*	21	4.1
6.	ERP system misfit with organizational culture & structure							*			*		*	14	2.7
7.	Inadequate education and training for users			*	*		*	*					*	21	4.1
8.	Lack of user allowance for attendance of system training			*		*								4	0.8
9.	Poor communication between ERP project team members & organizational members	*	*	*	*	*		*				*		20	3.9
10.	Users' resistance to change			*				*			*		*	14	2.7

continued on following page

Table 3b. Continued

#	Challenges	31	32	33	34	35	36	37	38	39	40	41	42	Grand Total	%
11.	Poor quality of testing						*							8	1.6
12.	Lack of top management support	*		*	*	*		*		*	*		*	31	6.0
13.	Lack of senior management leadership			*				*						8	1.6
14.	Lack of recognition of the need for managing change				*	*		*			*		*	16	3.1
15.	High turnover rate of project team members						*							5	1.0
16.	Over-reliance on heavy customization				*			*				*		18	3.5
17.	Poor consultant effectiveness						*							7	1.4
18.	Poor knowledge transfer			*				*						15	2.9
19.	Poor quality of BPR				*	*	*	*	*		*		*	23	4.5

continued on following page

Table 3b. Continued

#	Challenges	31	32	33	34	35	36	37	38	39	40	41	42	Grand Total	%
20.	Too tight project schedule							*						8	1.6
21.	Unclear concept of the nature & use of ERP system from the users' perspective													6	1.2
22.	Unrealistic expectations from top management concerning the ERP		*										*	11	2.1
23.	Change in business goals during the project	*												3	0.6
24.	Political pressures		*		*									8	1.6
25.	Treated as an IT project				*			*						4	0.8
26.	Poor user involvement	*	*	*				*					*	17	3.3
27.	Inadequate resources	*		*				*					*	8	1.6
28.	Inaccurate data				*			*						11	2.1

continued on following page

Table 3b. Continued

#	Challenges	31	32	33	34	35	36	37	38	39	40	41	42	Grand Total	%
29.	Poor project management effectiveness	*	*	*	*			*			*			19	3.7
30.	Functionality problems with the system				*									6	1.2
31.	Software modification			*										5	1.0
32.	Informal strategy			*										2	0.4
33.	Part-time dedication		*											4	0.8
34.	Dilemma of internal integration				*			*						4	0.8
35.	Conflict between organization & consultant							*					*	8	1.6
36.	Conflict between organization & vendor							*						6	1.2
37.	Frequently changes in skilled end users									*				2	0.4
38.	Government structure of the organization													2	0.4
39.	High employee's average age				*									2	0.4

continued on following page

Table 3b. Continued

#	Challenges	31	32	33	34	35	36	37	38	39	40	41	42	Grand Total	%
40.	High inflation rate													1	0.2
41.	High system complexity						*	*			*	*	*	7	1.4
42.	Internal conflict between departments			*				*						9	1.7
43.	Key users' replacements after their training							*			*		*	5	1.0
44.	No flexibility													1	0.2
45.	Unstable ERP products													4	0.8
46.	Inadequate ERP teamwork and composition				*			*						7	1.4
47.	Wrong ERP product selection			*									*	5	1.0
48.	Unrealistic ROI										*			3	0.6

continued on following page

Table 3b. Continued

#	Challenges	31	32	33	34	35	36	37	38	39	40	41	42	Grand Total	%
49.	Poor testing							*			*		*	9	1.7
50.	High attrition rate of project team members				*									4	0.8
51.	Inappropriate timing of go-live							*						3	0.6
52.	Unavailability of right users during user acceptance testing													1	0.2
53.	Inadequate legacy system knowledge													1	0.2
54.	Poor interdepartmental alignment			*										3	0.6
55.	Poor standards in measuring quality of a system							*		*		*		4	0.8
56.	Security/privacy/trust issues													3	0.6
57.	Conflict of interest							*			*			3	0.6
58.	Lack of vendor support			*				*			*			7	1.4

continued on following page

Table 3b. Continued

#	Challenges	31	32	33	34	35	36	37	38	39	40	41	42	Grand Total	%
59.	Unexperienced project manager													2	0.4
60.	Personal resistance of stakeholders	*		*				*						4	0.8
61.	Weak commitment of project team	*	*					*					*	5	1.0
62.	Organization policies		*	*	*									4	0.8
63.	Lack of continuous monitoring approach			*										2	0.4
64.	Fear of loss of job				*									2	0.4
65.	Improper definitions of roles and responsibilities												*	2	0.4
Grand Total														516	100

an improvement in the customer experience, the development of new consumer relationships, and the establishment of new operational models. When businesses transition from legacy systems to change management, they achieve success in terms of competitiveness. However, change management is critical for benefits realization, and organizations adopting ERP will not realize market advantages if end users are unable to accept the latest technology (Kanellou & Spathis, 2013; Mahraz et al., 2018; Mahraz et al., 2020). According to Shang and Seddon (2003), ERP also gives firms technological advantages. According to the literature reviewed, when firms effectively adopt an ERP, the presence of IT infrastructure indicates the availability of rapid and easy data input and data output compilation (Fadellemloula, 2018; Kanellou & Spathis, 2013; Mahraz et al., 2018; Sriram et al., 2018; Weli, 2019; Zainol et al., 2017). However, the failure rate as a result of Prasetyo et al. (2019) is extraordinarily high, which does not negate the benefits of implementing an ERP. Thus according to their study, the inability to implement ERP ranges between 67% and 90%, and that latest study focuses mostly on the benefits and critical success factors of ERP rather than resolving and defining the ERP-related issues.

ERP CHALLENGES

Previous study indicates that ERP boosts productivity, profitability, and integration success (De Castro Silva & De Oliveira, 2015; Doom et al., 2010; Nawaz & Channakeshavalu, 2013; Maditinos et al., 2012). This has resulted in the widespread adoption of ERP systems in both corporate and public sectors. Over time, a substantial body of literature has arisen on the deployment of ERP, focusing on the difficulties inherent in the numerous implementation stages. However, it is critical to identify these problems and how to resolve them, since they are already escalating. Additionally, Phaphoom et al. (2018) discovered that certain concerns arise as a result of an enterprise's attitude toward change and culture being at odds with the ERP initiative's purpose.

Many challenges that influence ERP are discussed in the literature, as well as how to overcome these challenges. The study discovered 65 challenges, as shown in Table 4. Project management, organizational, technology & vendor, technical/architecture, employee/ personnel/ HR, people/end-user, strategic, operational/ business, management commitment, and process were the major categories identified by the reviewed papers (Ebad, 2016; Amid et al., 2012; Ganesh & Mehta, 2010a; Garg & Khurana, 2017; Khanfar et al., 2018; Kheybari et al., 2020; Mahmood et al., 2019; Sar & Garg, 2012; Tsai et al., 2005). Lack of top management support, weak BPR quality, poor IT infrastructure, insufficient user education and training, poor coordination between members of the ERP project team & organizational stakeholders, underestimated timeline and budget, low efficiency of project management, lack of IT expertise, over-reliance on heavy customization, low user engagement, lack of understanding of the need for change management, weak transfer of knowledge, misfit of the ERP system with corporate culture & structure, the resistance of users to reform, unrealistic expectations from ERP top management and unreliable data are among the top 16 critical challenges facing ERP.

In a study focused on content analysis of published articles documenting the introduction of SAP in 44 organizations, Gargeya and Brady (2005) examined and evaluated common situations that exist within most ERP projects, and identified the areas that are critical to performance and those that lead to failure. The lack of an acceptable culture and internal organizational readiness were the most major reasons contributing to the failure of SAP implementation in 15 firms, according to their study. However, because the data used in their analysis was secondary data, not all of the factors that contributed to SAP's failure were disclosed. Further study was conducted with senior executives, ERP project managers, core users, and end-users from Taiwanese organizations, and it was discovered that timeframe, project management, staff training, and change management are the primary barriers to ERP system adoption (Tsai et al., 2005). Related studies used multiple case study analysis approaches to review the current literature on ERP implementation problems during the implementation phases and the causes of ERP failure, and discovered that poor ERP consultant performance and poor project management performance may be the causes of low-quality business process reengineering (Bingi et al., 2006; Wong et al., 2005). Weak consultant efficiency, poor project management efficacy, low quality of business process reengineering (BPR), poor quality of testing, and inadequate top management support were all mentioned as major failure factors.

The failure of ERP customization has been proven to be the interplay of institutionalized accounting systems, competing structures, economic dynamics, and market powers (Kholeif et al., 2007). They used an in-depth case study informed by modern institutional sociology, specifically the interplay of competing structures, power dynamics, and market forces, in their research. Furthermore, Pan et al., (2007) identified a lack of knowledge management as a major challenge to ERP implementation, and their analysis recognized through a single case study that the lack of organizational readiness on the part of companies served as a major challenge to ERP implementation through their suggested process recursive dynamic systems model (PRISM). Poor planning/management, insufficient training methods, a lack of top management commitment, a lack of middle management commitment, treating ERP implementation as an IT initiative, inadequate functional specifications, poor selection of ERP products, over-reliance on heavy customization, inaccurate data, poor test quality, insufficient go-

Table 4. ERP challenges

	Challenges		Challenges
1.	Lack of top management support	34.	Internal conflict between departments
2.	Poor quality of BPR	35.	Key users' replacements after their training
3.	Poor IT infrastructure	36.	Inadequate ERP teamwork and composition
4.	Inadequate education and training for users	37.	Wrong ERP product selection
5.	Poor communication between ERP project team members & organizational members	38.	Poor testing
6.	Underestimated timeline and budget	39.	Lack of vendor support
7.	Poor project management effectiveness	40.	Weak commitment of project team
8.	Lack of IT expertise	41.	Lack of user allowance for attendance of system training
9.	Over-reliance on heavy customization	42.	Treated as an IT project
10.	Poor user involvement	43.	Part-time dedication
11.	Lack of recognition of the need for managing change	44.	Dilemma of internal integration
12.	Poor knowledge transfer	45.	Unstable ERP products
13.	ERP system misfit with organizational culture & structure	46.	Unrealistic ROI
14.	Users' resistance to change	47.	High attrition rate of project team members
15.	Unrealistic expectations from top management concerning the ERP	48.	Poor standards in measuring quality of the system
16.	Inaccurate data	49.	Personal resistance of stakeholders
17.	Lack of appropriate culture	50.	Organization policies
18.	Lack of organizational readiness	51.	Change in business goals during the project
19.	Poor quality of testing	52.	Informal strategy
20.	Lack of senior management leadership	53.	Frequently changes in skilled end users
21.	High turnover rate of project team members	54.	Government structure of the organization
22.	Poor consultant effectiveness	55.	High employee's average age
23.	Too tight project schedule	56.	High inflation rate
24.	Unclear concept of the nature & use of ERP system from the users' perspective	57.	No flexibility
25.	Political pressures	58.	Inappropriate timing of go-live
26.	Conflict between organization & consultant	59.	Unavailability of right users during user acceptance testing
27.	Conflict between organization & vendor	60.	Inadequate legacy system knowledge
28.	Inadequate resources	61.	Poor interdepartmental alignment
29.	Functionality problems with the system	62.	Security/ privacy/trust issues
30.	Software modification	63.	Conflict of interest
31.	High system complexity	64.	Unexperienced project manager
32.	Fear of loss of job	65.	Lack of continuous monitoring approach
33.	Improper definitions of roles and responsibilities		

live timing, low consultant efficiency, unreasonable expectations, too tight project timelines weak, IT infrastructure, the resistance of users to change, a high turnover rate of project team members, inadequate resources, low user engagement, misfit ERP applications, system functionality issues, and cost overruns have all been mentioned by several authors as a major challenge of ERP implementation (Ganesh & Mehta, 2010a, 2010b; Garg, 2010; Noudoostbeni et al., 2009).

Recent study indicates that a poor grasp of business outcomes and needs, poor data quality, and a lack of top management support all contribute to ERP failure, and hence deserve special attention throughout the ERP implementation phase (Amid et al., 2012; Jharkharia, 2011). In a study that was subjected to root cause analysis of the challenges facing ERP implementation, Sar and Garg (2012) identified the main ERP issues, including a lack of business strategy and vision, weak vendor support, weak interdepartmental coordination, insufficient ERP teamwork, and composition, a poor partnership between implementation consultants and managers, business user unavailability during setup, unrealistic ROI, and poor ERP vendor credibility. While Albliwi et al. (2014), Basu and Biswas (2013), Garg and Garg (2013), Peci and Važan (2014), and Ravasan and Mansouri (2014) utilized different analysis methodologies, their results were similar to the Sar and Garg (2012) study.

To develop instruments for the ERP post-implementation failure assessment model, Motiei et al., (2015) employed a mixed methodology approach that included both interviews and literature reviews. Political and government pressures, inability to take on extra commitments, insufficient vendor assistance, and poor post-implementation ERP support are the primary ERP failure drivers, according to their findings. Top management engagement and support, project management, change management, education and training, business process re-engineering, and vendor management, according to Umar et al. (2016), are important considerations that organizations should recognize in the context of defining ERP problems and formulating a plan to address ERP delivery obstacles for developed country industries. However, such factors did not address the implementation and post-implementation processes. With the help of the property-based essential literature survey of current studies, Ebad (2016) reported that lack of top management support, corporate culture, business process reengineering, lack of training, and unavailability of project management office were key factors affecting software project failure. Their findings were similar to those of Chakravorty et al., (2016) and Zare Ravasan and Mansouri (2016), respectively.

Additional studies (Gabryelczyk & Roztocki, 2017; Garg & Khurana, 2017; Narayanamurthy & Gurusurthy, 2017; Rahmanimanesh et al., 2017; Saadé et al., 2017) have sought to explain the relationship between the challenges influencing ERP implementation. According to Saadé et al. (2017), the UN's bureaucratic structure encourages a bureaucratic mentality that is detrimental to the implementation of information systems in general, by removing the end-user from the technical process of functional specifications, and Gabryelczyk and Roztocki, (2017) argue that in the public sector, ERP implementations without BPM interventions are used to establish less ideal data flow, paperwork flow, and decentralized decision-making.

Current research indicates that the most critical causes of ERP implementation failure are stakeholder engagement, top management support, and planning, whereas project managers with extraordinary leadership and change management talents are anticipated to succeed (Aranyosy et al., 2018; ChePa & Jasin, 2018). The findings of Khanfar et al. (2018) and Sreedharan et al. (2018) show that factors related to internal organizational problems, such as the environment, communication, requirement definition, lack of knowledge, and lack of team enthusiasm, have the greatest impact on project failure. These findings do not refute recent ERP challenges in the current study (AlBar & Hoque, 2019; Kheybari et al., 2020; Kohansal, 2019; Mahmood et al., 2019; Menon et al., 2019; Morrisson, 2020; Prasetyo et al., 2019; Sancar Gozukara et al., 2020; Virzi, 2019).

Although the articles reviewed show that ERP challenges are becoming more prevalent, it is crucial to note that these challenges are not all that dissimilar. Scholars, policymakers, and organizations, on the other hand, must have the tools they need to confront these challenges.

ADDRESSING ERP CHALLENGES

Previous research has mostly explored and characterized the challenges that hinder ERP implementation, but solutions to these challenges have received little attention. While businesses can address these deficiency causes and strengthen their management, they can also maximize the ERP system's performance rate. This section defines and discusses the solutions given in the literature to the challenges described in section 4.

Poor Consultant Effectiveness

The assistance of consultants is critical for many firms attempting to deploy an ERP system. Consultants are required for organizational change management, technology appraisal, business process reengineering, post-implementation & benefits recognition, project auditing, and contract negotiation. Prior to ERP deployment, the project manager should analyze the competencies of the consultants to address low consultant efficacy (Umar et al., 2016; Wong et al., 2005). Consultants must be selected, evaluated, managed, collaborated with, and monitored by project teams. If the problem is not acceptable, it is critical to take proper steps to rectify it, as ERP flaws can quickly cause problems. As a result, it is critical to guarantee that consultants' work meets professional standards. In addition to process awareness, consultants should be able to demonstrate mastery of technical communication skills, strong language abilities, technology experience, and business analytical skills (AlBar & Hoque, 2019). Anything less would make it impossible for consultants to be considered change agents. Consultants will aid organizations in assessing their corporate culture and the responsiveness of employees to transition, just as they did with relevant experience, during the implementation of a change management strategy.

Poor Project Management Effectiveness/ Poor Quality of BPR/ Overreliance on Customization

To solve the problem of poor project management performance on ERP systems, Kheybari et al. (2020) and Morrisson (2020) recommend that firms create a project management unit and assemble a project management team. Following the formation of a project management team, a project manager should be recruited, as well as relevant individuals who are familiar with corporate business practices and the value of an ERP system. ERP project schedule and reporting should also be closely monitored by project managers. This is to ensure that the knowledge transfer method is successful, that the consultants' quality is up to professional standards, and that BPR is carried out professionally and efficiently. Furthermore, AlBar and Hoque (2019) suggest that after an organization's business processes have been converted to an ERP system, the adaption of conventional ERP systems to match specific business processes may be possible. Specific ERP solutions may be able to reduce the resistance between corporate business processes and an ERP system. While a customized ERP system is expensive and difficult to implement, the demands of specific business processes must usually be met. Top management and the project team should not believe that customization can address all of a company's problems, and then rely on ERP customization to fix ERP misfit concerns. According to Umar et al. (2016) it is vital to reduce variation and strive towards standardization. To eliminate integration challenges, adopt best practices and abandon the legacy system, finish domain expert committee TO-BE protocols, fix module integration issues, and share the enterprise blue print with all teams.

Wrong ERP Product Selection

Before the ERP selection process, it is necessary to conduct a thorough and systematic evaluation of the potential candidates for ERP systems and consulting firms (Asiedu & Alfen, 2016; Jharkharia, 2011; Wong et al., 2005). Companies are still focusing on technique optimization rather than evaluating

procedures to rectify inaccurate ERP product selection. This is crucial because, even if an organization switches from a legacy system to a modern ERP system, the new system does not affect business processes instantaneously. They can also invite suppliers for on-site exploration after organizations have reinforced their systems, giving each of their top vendors the same amount of time to understand their specifications. It is recommended that businesses follow the planning, discovery, analysis, and selection process (Kohansal, 2019; Menon et al., 2019; Prasetyo et al., 2019).

During the planning process, organizations should be able to determine the type of collection. That is exactly what will be employed with the most recent program, which will include corporate divisions, operating zones, and geographical areas. They can also get buy-in from stakeholders and identify process owners and subject matter experts in addition to forming a core team. As a result, it is critical to determine the project's priorities and deliverables. The organization must do workshop collection requirements during the discovery stage to understand current business processes. Process analysis and process development are crucial tasks during requirement gathering workshops. During the analysis stage, the companies should review the request for proposal feedback and write demo scripts. Once vendors have given their demos, it is critical to review the demo ratings, both cross-functionally and by functional area. Finally, they should go to the selection stage, where organizations can do an overall cost of ownership analysis, paying special attention to the hidden costs that many businesses overlook (Motiei et al., 2015). Once firms are aware of the costs, they can work with ERP vendors to lower software and service cost. Organizations must have a thorough grasp of how this process works and what they will be responsible for in comparison to what the provider is liable for.

Lack of Top Management Support

Top management support is a critical part of the plan for a successful ERP implementation. Appropriate top management assistance should be provided throughout the ERP's life cycle, whether in project participation, finance, or human resource support. According to Kheybari et al. (2020), executive buy-in is high before the selection, but it is lower after the selection. As a result, it is critical to employ change management approaches to maintain executive participation. According to several studies (AlBar & Hoque, 2019; ChePa, & Jasin, 2018; Ganesh, & Mehta, 2010; Prasetyo et al., 2019; Sancar Gozukara et al., 2020; Sreedharan et al., 2018), to acquire top management support:

1. Companies must determine what their top management expects from the proposed ERP system.
2. Organizations should seek advice from a third party. That is a third-party expert.
3. The firm should have compiled some figures. This may entail gathering information from company studies, which serve to demonstrate the importance of management involvement.
4. The company should strive to discover the problem through internal processes (ask employees about problems they're having and explain them to management by quantifying the company's costs).
5. A business case should be developed. This entails giving top executives a realistic picture of the present system's overall cost of ownership (TCO) for the next five years, as well as market benefits, time savings, and cost comparison.
6. A risk management framework should be designed to ensure that the organization mitigates risks that the project team does not recognize, decreasing top management's fear of cost and schedule overruns.
7. The project team must identify alliances with other functional areas or divisions.
8. The organization learns from past change management mistakes.

Inadequate Education and Training for Users

Top management, the project team, and users should get effective training on "what" ERP is and "how" to implement ERP schemes, the procedures involved in executing BPR, the potential hazards, and the

importance of collaborating with third parties (Garg & Garg, 2013; Sreedharan et al., 2018; Umar et al., 2016). Training should be offered throughout the ERP implementation life cycle. Various training approaches, such as preparing for the training program and computer-based training (CBT), should be available. It should be able to identify qualified trainers and trainees. Management necessitates the creation of a learning environment in which individuals can gain a better understanding of the current system. There should be early preparation to overcome insufficient ERP user preparation and training, and project managers often believe that staff training should take place a few weeks before improvements are implemented. Instead, personnel can go through numerous rounds of training long before they are required to apply new processes and technology. Employees keep information and learn to use the latest technological innovations as they are phased out over time through daily training exercises (AIBar & Hoque, 2019; Bingi et al., 2006; ChePa & Jasin, 2018; Pan et al., 2008). Organizations or ERP providers can customize the training supplied to users because most firms provide training manuals for their products, but the training is not personalized. When firms train employees without knowing the complexities inherent to their organization, workers may experience uncertainty, and training may not be as effective. Training manuals can also be tailored to a company's specific organizational structure. A training program can involve more than just learning how to utilize the ERP system. Employees will have to think about what procedures and actions are necessary outside of the system.

Users' Resistance to Change and Poor User Involvement

During the ERP life cycle, effective change control can be adopted to reduce user resistance to change and poor user engagement, such as how ERP programs can improve the effectiveness of company operations, allowing employees to focus on value-added tasks (Chen et al., 2009; Wong et al., 2005). Team leaders should assist users in developing a habit of using the new system. A prototype can be created to give users and the industry an overview of the new framework's benefits. According to Sancar Gozukara et al. (2020), user resistance can be reduced by identifying system users' demands, sufficiently describing system users' functions and responsibilities, and having top management assist in addressing user uncertainty and alleviating the ERP system's ambiguity. Organizations must also raise ERP system awareness among system users early in the ERP system's deployment, and users must participate in all stages of the ERP system.

Underestimated Timeline and Budget

Organizational concerns about the substantial initial investment in the on-site ERP system cannot be overlooked. However, in the long run, the entire cost will be reduced. During the ERP installation chartering process, the project manager can create a detailed and realistic project timeline. Specific projects that will be carried out with the help of consultants, as well as milestones to be met, should be included. The project plan should be realistic, and extra-human capital should be distributed as needed to keep project team members from being overburdened (Amid et al., 2012; Noudoostbeni et al., 2009). The project schedule/timeline should be approved by all senior management and project team members. There should be a precise project timeline in place, and timetables with specific goals should be pursued. Project managers must appropriately manage the project's magnitude in terms of the period available, budget constraints, and momentum (Jharkharia, 2011). Quality assurance on milestone or deliverable delivery, as well as user acceptance testing, should be a sign of effective project management.

During the installation phase, firms should collaborate with their internal staff as well as each ERP consultant to boost internal staff understanding. Internally trained personnel can successfully manage and maintain the ERP system and the organization's cash flow (Sreedharan et al., 2018). On-premise ERP systems are expected to take a long time to implement, resulting in a protracted-time to market. The issue of long implementation times can be addressed by adopting an optimized

deployment technique rather than a normal implementation approach. The rapid ERP deployment method provides a speed advantage in ERP applications while also addressing the issue of long implementation times and time to market.

Lack of IT Infrastructure and Inappropriate Timing of “Go-Live”

IT should be designed to meet business capability requirements while also addressing a lack of IT infrastructure and implementation time. Before the “go-live” date, adequate monitoring of business procedures, staff awareness of ERP, data accuracy, and ERP applications should be carried out to guarantee that the firm is ready (Kohansal, 2019). This can help to reduce the chances of ERP rollout failure.

Inadequate ERP Teamwork and Composition

When it comes to large-scale initiatives involving various stakeholders, forming a project team is critical. This project team should include an internal change management team that is responsible for assessing employee readiness for transition and implementing a change management strategy. A large team of qualified and trained individuals should be formed according to the project’s demands to address the problem of insufficient coordination and project management composition (Ganesh & Mehta, 2010b, 2010a). The project manager must also motivate and inspire those who are working on it. As a result, the project manager can choose a lower-level leader who can improve performance while also maintaining external inspection. According to Morrisson (2020), a mixture of an implementation team should be recruited to the project that includes all internal staff, system users, and professional ERP consultants for the performance of an ERP system and the efficacy of an ERP deployment.

Poor System Testing and Inaccurate Data

The organization should thoroughly analyze the functionalities that are currently in use and stop running a legacy system in parallel. The project manager is in charge of the collaboration between process owners, developers, managers, senior management, and users. Data gathering is critical, and a complete data collection procedure, such as data entering and exiting SAP, must be tracked. All business requirements must be tracked properly, and the defined requirements must be mapped into the structure (Sancar Gozukara et al., 2020). The domain expert should frequently be included in user acceptance testing (UAT).

Poor Knowledge Transfer

If a person plays a significant role in the company’s leaving, the business must have a contingency plan in place for the transfer of information (ChePa & Jasin, 2018; Virzi, 2019). For potential projects, it would be beneficial to conduct lesson learned research.

Lack of Recognition of the Need for Change Management

It is proposed that senior management and the project manager collaborate to alleviate user concerns about the new system by discussing the issue of lack of awareness about the need for change management (Rahmanimanesh et al., 2017; Wijaya et al., 2017). Demonstrations and information sessions should be held to empower and educate people about the new system (Khanfar et al., 2018; Pan et al., 2007). Due to the predominance of low levels of knowledge, firms must hire change management consultants. Additionally, businesses can track the ERP system’s required improvements effectively by preserving logs and using an effective change control mechanism (Garg, 2010; Gargeya & Brady, 2005). Businesses can successfully implement an ERP system by altering their operational processes and changing the way they conduct business.

Poor Communication Between ERP Project and Organizational Team and System Use

When businesses seek to solve the issue of insufficient communication, they must ensure good collaboration across many departments. Organizations are recommended to establish divisions such as Organization Change Management (OCM) that can play a crucial role in ensuring the ERP system is implemented successfully. It is prudent to develop a negotiation strategy that identifies who, why, when, and how the change will occur. While executive buy-in diminishes following selection, staff buy-in also increases, as Menon et al. (2019). Employee buy-in takes time, and often, regardless of how frequently the organization engages with employees before selection, employees must be personally involved in selection processes to feel secure about the initiative. Employees should be permitted to attend vendor presentations and provide feedback on system features (Sancar Gozukara et al., 2020). It would enable them to exit the application process with a clear grasp of how the new system will improve their work.

Dilemma of Internal Integration

The organization should assign numbers to integration points, which should be kept by the project management office. The vendor's experts should provide a solution for the integration points. These areas of process improvement must be monitored and regulated continuously during the establishment of TO-BE processes (Hasan et al., 2019; Wong et al., 2005).

Lack of Vendor Support

Choosing the appropriate ERP vendor is critical to the project's success because the vendor plays such an important part in the installation process. An experienced vendor is needed by the client organization. The project team must also keep in mind that the timely arrival of vendors contributes to an ERP implementation's success. To lessen their reliance on outside sources, company employees must establish vendor loyalty and have the confidence to use their abilities, learn new things, and improve their competence levels (Sancar Gozukara et al., 2020; Sreedharan et al., 2018; Zerbino et al., 2017). They will need to have as many internal employees as the ERP vendors/consultants demand to successfully implement and run the ERP system.

Conflict of Interest

Organizations and ERP vendors face a conflict of interest problem when providers fail to meet their clients' expectations (Brad et al., 2013; Prasetyo et al., 2019). To meet criteria and satisfy enterprises, ERP providers should supply their clients with distinctive strategies. ERP extensions could be included by vendors to bridge the gap between the ERP system's capability and organizational needs. ERP companies may edit the source code of ERP systems to deliver customized solutions. Modification leads to ERP techniques that improve the satisfaction of organizations while also resolving the problem.

Unrealistic Return on Investment (ROI)

The ERP system's discovered return on investment is seen as a key financial impediment to its implementation. Most organizations spend 3-7 times more money on the installation and operation of an ERP system than they do on a software license (Gabryelczyk & Roztocki, 2017). The ERP system must be fully operational before it can provide benefits and reliability to operational procedures. It is recommended that organizations conduct a survey twice a year to help them measure the value they obtain from the ERP systems used.

ERP/Organizational Misfit

Generic ERP modules are not capable of meeting specific requirements, but they are designed to meet the enterprise's demands and accommodate operating operations. However, in rare cases, ERP

modules may fail to transmit relevant needs promptly. In this instance, new dedicated modules must be added to the ERP modules. This, in turn, would take more time and, as a result, reduce efficiency, increase difficulty, and require more maintenance. To address the lack of expressiveness difficulties and to adapt the ERP system to corporate business processes, extensive adjustments to the ERP system are recommended (Chakravorty et al., 2016; Sancar Gozukara et al., 2020). ERP vendors should have more precise and divisional solutions that meet the demands of these businesses to meet their requirements and address the issue of ERP system organizational in-adaptation (Arachchi et al., 2019).

High System Complexity

According to Garg and Khurana (2017), ERP is sophisticated software; yet, firms should consider and cope with this complexity by selecting senior managers throughout all phases of the ERP system deployment process. Top management’s direct involvement in the ERP system’s implementation influences the project’s success and aids in overcoming the system’s complexity issue.

Unavailability of Right Users During User Acceptance Testing

Organizations should provide system users with an appropriate understanding of how to utilize the ERP system, rather than relying solely on external teams and experts to implement the ERP system. Bidirectional knowledge sharing between ERP consultants and the project team is essential for effective ERP implementation. Developing in-house expertise reduces reliance on vendors, promotes user engagement, and aids in the resolution of technical ERP difficulties. Employees that are familiar with the organization should pass on their knowledge to ERP vendors to have a strong ERP scheme (Ravasan & Mansouri, 2014; Umar et al., 2016).

Lack of Organizational Readiness

Companies should not implement ERP until they have a thorough understanding of their current workforce and their history. To address the lack of organizational readiness, organizations should undertake an online survey and a series of focus group sessions. This will provide them with an insight into their organizational culture’s strengths and weaknesses (Morrisson, 2020; Sancar Gozukara et al., 2020; Wong et al., 2005). This experience can also be used to identify the core causes of change resistance, which can aid firms in evaluating reform plans.

While several studies have offered various solutions to the problems associated with the installation of an ERP, the current study found that many more of these issues have not been satisfactorily addressed. Table 5 summarizes several unresolved challenges that demand attention.

Table 5. Challenges not addressed

	Unaddressed Challenges		Unaddressed Challenges
1.	Lack of business case and benefits realization plan	10.	Inadequate legacy system knowledge
2.	Lack of continuous monitoring approach	11.	No flexibility
3.	Fear of loss of job	12.	High inflation rate
4.	Improper definitions of roles and responsibilities	13.	High employee’s average age
5.	Conflict of interest	14.	Government structure of the organization
6.	Security/ privacy/trust issues	15.	Frequently changes in skilled end users
7.	Poor interdepartmental alignment	16.	Personal resistance of stakeholders
8.	Change in business goals during the project	17.	Poor standards in measuring the quality of system
9.	Organization policies	18.	Part-time dedication

Table 6 summarizes how the major challenges were addressed in the reviewed literature. The following challenges were thus addressed: poor consultant effectiveness, poor project management effectiveness/ poor quality of BPR/ overreliance on customization, wrong ERP product selection, lack of top management support, inadequate education and training for users, users' resistance to change, and poor user involvement, underestimated timeline & budget, lack of IT infrastructure and inappropriate timing of "go-live", inadequate ERP teamwork and composition, poor system testing and inaccurate data, poor knowledge Transfer, and lack of recognition of the need for change management. This was followed by poor communication between ERP project & organizational team and System Use, the dilemma of internal integration, lack of vendor support, conflict of interest, unrealistic return on investment (ROI), ERP/Organizational Misfit, high system Complexity, unavailability of right users during user acceptance testing and lack of organizational readiness.

ANALYSIS AND DISCUSSIONS

Based on the reviewed articles, it is acknowledged that the ERP literature has been thoroughly investigated and has reached mature quality. As the burden of maintaining antiquated systems and other aging devices increases as the world enters the post-digital era, more businesses upgrade to new ERP systems and generate economic benefit. These current ERP systems are expensive, sophisticated, and occasionally fail. This highlights the critical importance of identifying and comprehending the obstacles to ERP deployment and developing strategies to overcome them. The literature on the challenges now confronting ERP deployment covers topics such as essential failure elements, implementation, life cycle, failure dimensions, post-implementation, experience cycle, and post-implementation.

Numerous works of literature have developed a structure for categorizing these challenges to define the difficulties/ failure factors affecting the implementation of ERP, which primarily include project management, organization, technology & provider, employee/ personnel/ HR, technical/ architecture, individual/ end-user, strategic, operational/ business, management engagement, and process (Ebad, 2016; AlBar & Hoque, 2019; Amid et al., 2012; Ganesh & Mehta, 2010; Garg & Khurana, 2017; Garg, 2010; Garg & Garg, 2013; Khanfar et al., 2018; Mahmood et al., 2019; Menon et al., 2019; Rahmanimanesh et al., 2017; Sancar Gozukara et al., 2020; Sar & Garg, 2012; Tsai et al., 2005). Organizations prioritize project management, organizational structure, and technology and provider implementation. To attain projected market advantages, organizations must consider not just these factors, but also additional categories of challenges/failures such as environment, performance, leadership, communication, and planning. To help lower the failure rate of ERP implementations, it is beneficial to build a robust framework for analyzing crucial failure determinants by ERP core market participants, academic researchers, and policymakers. Additionally, the study by Wong et al. (2005) acknowledges that future research should focus more on the interrelationships between the factors.

Lack of top management support, poor BPR quality, poor IT infrastructure, insufficient user education and training, poor communication between ERP project team members and organizational members, underestimated timeline and budget, poor project management effectiveness, lack of IT expertise, over-reliance on heavy customization, and poor user involvement are the top ten key issues to overcome in addressing the challenges affecting ERP implementation. Poor knowledge transfer, users' resistance to change, ERP system misfit with organizational culture & structure, unrealistic expectations from top management concerning the ERP, inaccurate data, lack of appropriate culture, internal conflict between departments, poor testing, lack of organizational readiness, poor quality of testing, lack of senior management leadership, too tight project schedule, inadequate resources, conflict between organization & consultant, lack of vendor support, high system complexity, inadequate ERP teamwork and composition, poor consultant effectiveness, unclear concept of the nature & use of ERP system from the users' perspective, functionality problems with the system, conflict between organization & vendor, high turnover rate of project team members, software modification, key users'

Table 6. General Solutions for ERP challenges

Problem	General solutions	References
Poor Consultant effectiveness	<ul style="list-style-type: none"> • Until ERP implementation, project management should evaluate the capabilities of consultants. • Project teams must select, evaluate, execute, collaborate and monitor the level of consultant productivity. 	Umar et al. (2016); Wong et al. (2005) AlBar & Hoque, (2019)
Poor project management effectiveness/ poor quality of BPR/ overreliance on customization	<ul style="list-style-type: none"> • Creation of a unit for project management. • Relevant Project Team. • Keep note of business process changes. • An ERP system customization. • Modification of procedures for corporate business. • Using re-engineering tools for enterprise processes. 	Kheybari et al. (2020); Morrisson (2020); AlBar and Hoque (2019)
Wrong ERP product selection	<ul style="list-style-type: none"> • Create a thorough and systematic review of the possible candidates for consultancy services and ERP systems. • Until assessing systems, look for process change. • Plan, explore, evaluate, and process selection. 	Asiedu, & Alfen (2016); Jharkharia (2011); Wong et al. (2005); Motiei et al. (2015); Kohansal (2019); Menon et al. (2019); Prasetyo et al. (2019)
Lack of top management support	<ul style="list-style-type: none"> • Top management participation in the implementation process for the ERP. • The organizations find out what executives want from the ERP system. • The organizations engage a third party. • Try to understand the issue with the existing systems. • There should be a business case built. 	Kheybari et al. (2020); AlBar & Hoque (2019); ChePa, & Jasin (2018); Ganesh, & Mehta, (2010); Prasetyo et al. (2019); Sancar Gozukara et al., (2020); Sreedharan et al. (2018)
Inadequate education and training for users	<ul style="list-style-type: none"> • Training should be provided in all phases of the life cycle of ERP implementation. • Early training can take place. • Training sessions regularly. • The training offered to users should also be customized by organizations or ERP providers. • A training program can include more than just how the ERP system should be used. 	Garg & Garg (2013); Sreedharan et al. (2018); Umar et al. (2016); AlBar & Hoque (2019); Bingi et al. (2006); ChePa & Jasin, (2018); Pan et al. (2008)
Users' resistance to change and poor user involvement	<ul style="list-style-type: none"> • Understanding the needs of system users. • Clarification of system users' functions and duties. • Providing support from senior management. • Training users of an ERP system. • Take user resistance as an ERP application input. 	Sancar Gozukara et al. (2020); Chen et al. (2009); Wong et al., (2005)
Underestimated timeline & budget	<ul style="list-style-type: none"> • A comprehensive and realistic project schedule should be devised by the PM. • The timeline of the project should be feasible. • All the top leadership and project management members should endorse the project plan/timeline. • Organizations, along with each ERP consultant, should collaborate with their internal employees. 	Amid et al. (2012); Noudoostbeni et al. (2009); Jharkharia, (2011); Sreedharan et al. (2018)
Lack of IT infrastructure and inappropriate timing of "go-live"	<ul style="list-style-type: none"> • IT should be built to fulfill the requirements for business capacity. • Sufficient testing should be carried out, such as business processes, ERP expertise of users, data consistency, and ERP systems. 	Kohansal (2019)
Inadequate ERP teamwork and composition	<ul style="list-style-type: none"> • Mix the implementation team with internal personnel, system users & technical ERP consultants. 	Ganesh & Mehta, (2010b, 2010a); Morrisson (2020)
Poor system testing and inaccurate data	<ul style="list-style-type: none"> • ERP Modules Testing. • Testing each ERP module according to the business process connected to it. 	Sancar Gozukara et al. (2020)
Poor knowledge Transfer	<ul style="list-style-type: none"> • A company must have a knowledge transfer contingency strategy in place. • A lesson learned report should be provided. 	ChePa & Jasin, (2018); Virzi, (2019)

continued on following page

Table 6. Continued

Problem	General solutions	References
Lack of recognition of the need for change management	<ul style="list-style-type: none"> • Efficient strategy method for change. • Management of traceable change. • Changes in an organizational business plan and the way they perform business. 	Khanfar et al. (2018); Pan et al. (2007); Garg (2010); Gargeya & Brady (2005)
Poor communication between ERP project & organizational team and System Use	<ul style="list-style-type: none"> • Establish department like organization change management (OCM) • Employees should be allowed to attend vendor demonstrations and rate system functionality • Build a communications strategy that defines the change: who, why, when, and how. 	Sancar Gozukara et al. (2020); Menon et al. (2019)
Dilemma of internal integration	<ul style="list-style-type: none"> • A solution for the integration should be recommended by vendor experts. 	Hasan et al. (2019); Wong et al. (2005)
Lack of vendor support	<ul style="list-style-type: none"> • Training users of the system and enhancing the organization's understanding of the ERP system. • Use in-house competencies. • Working together through the process of deployment with external ERP consultants. 	Sancar Gozukara et al. (2020); Sreedharan et al. (2018); Zerbino et al. (2017)
Conflict of interest	<ul style="list-style-type: none"> • Particular options for clients. • Extensions to ERP Sector. 	Brad et al. (2013); Prasetyo et al. (2019)
Unrealistic return on investment (ROI)	<ul style="list-style-type: none"> • Gain via a couple of months later. • Concentrate on re-use. 	Gabryelczyk & Roztocki (2017)
ERP/Organizational Misfit	<ul style="list-style-type: none"> • Offering more precise and divisional options for ERP. • Awareness in corporate history, non-European organizational systems, etc. 	Chakravorty et al. (2016); Sancar Gozukara et al. (2020); Arachchi et al. (2019)
High system Complexity	<ul style="list-style-type: none"> • Direct engagement in the implementation process by senior management. • The contribution of Key corporate management. • Train users. 	Garg and Khurana (2017)
Unavailability of right users during user acceptance testing	<ul style="list-style-type: none"> • Organizations should have trained users of the system with sufficient awareness of the application of the ERP system. • Growing expertise in-house. 	Ravasan & Mansouri (2014); Umar et al. (2016)
Lack of organizational readiness	<ul style="list-style-type: none"> • An online survey and a series of focus group meetings are undertaken by organizations. 	Morrisson (2020); Wong et al. (2005)

replacements after their training, wrong ERP product selection, and weak commitment of project team are some of the less serious but still significant challenges that influence ERP implementation (Abdelaziz et al., 2019; Amid et al., 2012; Arachchi et al., 2019; Aranyosy et al., 2018; Basu & Biswas, 2013; Bingi et al., 2006; Chakravorty et al., 2016; Chen et al., 2009; Garg & Khurana, 2017; Jharkharia, 2011; Kheybari et al., 2020; Kholeif et al., 2007; Kohansal, 2019; Mahmood et al., 2019; Menon et al., 2019; Narayanamurthy & Gurumurthy, 2017; Noudoostbeni et al., 2009; Pan et al., 2008; Peci & Važan, 2014; Prasetyo et al., 2019; Ravasan & Mansouri, 2014; Saadé et al., 2017; Sodhi et al., 2019; Virzi, 2019; Wong et al., 2005). It was discovered in previous research that the highly ranked ERP implementation challenges identified through a review of the literature also occurred as highly ranked challenges in similar studies. More research is therefore needed to determine the fundamental cause of their existence and the techniques proposed to remedy them.

To resolve the challenges surrounding ERP deployment, organizations must first determine what their top management requires from the new ERP system and then construct a business case to gain top management support. This includes giving top executives a realistic knowledge of the new system's total cost of ownership (TCO) over the next five years, as well as business benefits, time savings, and cost comparisons (AlBar & Hoque, 2019; ChePa, & Jasin, 2018; Ganesh, & Mehta, 2010; Prasetyo et al., 2019; Sancar Gozukara et al., 2020; Sreedharan et al., 2018). IT should be built to meet business

capacity requirements while also addressing a shortage of IT infrastructure and time to go online. All steps of the ERP deployment life cycle should include training. Employees will encounter difficulty when organizations train workers without understanding their organization's specific peculiarities, and training will not be as effective as it could be (Bingi et al., 2006; Pan et al., 2008). When it comes to resolving the problem of insufficient communication, organizations must guarantee that multiple entities work together effectively. Organizations can work with their internal employees as well as each ERP consultant during the installation process to develop the internal team's expertise. Management of the ERP system and the company's cash flow can be successfully operated and executed by freshly trained internal personnel (Sreedharan et al., 2018). As a result, top management and the project team must not believe that customization would solve all business challenges, and then over-rely on ERP customization to solve ERP misfit concerns. It is critical, according to Umar et al. (2016), to remove heterogeneity and strive for standardization. A prototype should be constructed to give users and the industry an overview of the present framework's benefits.

The majority of the evaluated publications from which the challenges relating to the implementation of ERP were reported were classified using research approaches such as literature review, case study, and survey. A few papers included interviews as well. Two strategies, such as literature review and interview, survey and interview, and observations and interview, were used in a few additional papers. The data reveal that for the majority of the papers examined, a single research approach was applied. In cases where a case study technique is employed in the evaluated literature, a single case study technique has been used (Kholeif et al., 2007; Menon et al., 2019; Sreedharan et al., 2018). It was not possible to use single case studies to find out about some of the most important problems that ERP implementations face (Ganesh & Mehta, 2010b; Garg, 2010). Future studies should include multiple case studies from various sectors (e.g., information technology and services, manufacturing, health, telecommunications, construction, and distribution), taking into account their sizes, as difficulties can vary between industries and sizes. Industry case studies, as well as cross-sector case studies, should be employed to validate study findings on ERP implementation issues. Given the limitations of case study methods, researchers must rely on quantitative approaches and surveys to get a more general conclusion. Incorporating the outcomes of both qualitative and quantitative investigations will become more relevant in the future. This can be done by focusing on the various deployment levels (pre-implementation, implementation, and post-implementation).

Researchers need to think about how different sectors, sizes, and places affect the implementation of ERP when they write about the challenges of ERP and come up with solutions. Even though most of the articles were based on literature and the region or country of the research was not stated, most of the countries and regions whose ERP implementation system was used for the analysis came from Iran, India, Malaysia, Saudi Arabia, the United Nations, the United States, Taiwan, Poland, Singapore, Pakistan, Hungary, Indonesia, and Canada. It has been stated that much of the research on the challenges to ERP deployment originates in developing countries (AlBar & Hoque, 2019; Arachchi et al., 2019; Aranyosy et al., 2018; Chen et al., 2009). As a result, generalizing research findings is difficult, therefore further research is needed to identify problems that affect ERP adoption in developing and undeveloped nations, as well as to propose solutions in that field. This will lead to cross-country/regional evaluations of the solutions to the ERP implementation challenges.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The study incorporates most of the existing literature on ERP challenges, solutions, and ERP deployment into a single study. The researchers' method of analysis demonstrated that they had a stronger understanding of the challenges that Enterprise resource planning systems face in a theoretical setting. In practice, further challenges must be defined and overcome, necessitating additional study.

The analysis also provides practitioners with a common platform to address the complexities of ERP implementation, the categories into which challenges can be categorized, and how to overcome

ERP challenges. Based on the studied literature, it can be affirmed that placing a strong emphasis on each step of the ERP implementation process will assist practitioners in addressing the issues associated with ERP implementation in a thorough manner. Practitioners must also pay attention to the most critical ERP challenges highlighted in the study to overcome ERP system failures. As a result, they must ensure that their timeline and budget are not underestimated, and that project management is carried out successfully. Top management must be fully committed to the ERP system's implementation, as well as a sufficient understanding of the necessity to manage change. Good communication between ERP project team members and organizational members can help achieve this. In all of these, practitioners must ensure that there is a robust IT infrastructure with experienced IT experts, and because a lack of training poses a significant issue, there should be enough education and training for users as it is linked to improving their adoption or usage of the system.

One of the most difficult aspects of ERP implementation was compromising on a standard architecture paradigm for the industry. Furthermore, the studied literature shows the lack of linkage between the various categories into which ERP challenges might be classified. Researchers may also improve their empirical approaches for identifying the issues that arise while applying ERP and, when appropriate, employ meta-analysis techniques.

LIMITATIONS, FUTURE STUDY, AND CONCLUSIONS

The study's purpose is to identify the various challenges to ERP implementation, as well as the categories into which these barriers have been classified by researchers and how these challenges can be addressed. The ERP literature is extensive and provides a wide range of knowledge in this field. According to the 2005-2020 study's analysis of the literature, the primary categories used to characterize the problems associated with ERP deployment include project management, organization, technology & supplier, employee/personnel/HR, technical or architecture, individual/end-user, strategic, operational/business, management involvement, and process. Organizations seeking to gain a better understanding of the issues confronting their deployed ERP must also pay closer attention to these categorizations. The entire investigation process was carried out using four databases, and it is noted that, while these databases are broad and so contain the bulk of related studies, they are not thorough. This means that some articles may have been overlooked. Although scholarly databases like Google Scholar produced more publications, filtering peer-reviewed quality studies proved difficult.

The study identified 42 articles and observed that research in the domain was declining significantly from 2018 to 2020. Lack of top management support, poor BPR quality, poor IT infrastructure, insufficient user education and training, poor communication between ERP project team members and organizational members, underestimated timeline and budget, poor project management effectiveness, lack of IT expertise, over-reliance on heavy customization, and poor user involvement are among the main issues that must be addressed to overcome the challenges that affect ERP implementation. In the current study, several possible techniques to overcome the known challenges of ERP deployment have been proposed. In the examined literature, there are also several challenges to ERP deployment that have yet to be addressed. The study's findings also show that agreement on an industry-standard development model for characterizing ERP challenges and providing solutions was one of the unsolved areas of ERP adoption. Furthermore, while pre-and post-implementation constraints exist, researchers have concentrated their efforts on the ERP implementation process.

Future studies should concentrate on building an industry-standard approach to implementing ERP for both pre-and post-ERP deployment concerns to detect and fix ERP challenges. The differences in ERP challenges between large and small enterprises, as well as how to overcome them, could be another fascinating area for future research. The study's long-term goal will be to empirically validate and define the interrelationships between the identified categories for classifying ERP challenges. Emerging enterprise innovations such as IoT, Big Data, and cloud computing with ERP platforms

have been introduced recently, and more research may be conducted to delve into the issues that have developed since their introduction.

CONFLICT OF INTEREST

The authors of this publication declare there is no conflict of interest.

FUNDING AGENCY

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

REFERENCES

- AboAbdo, S., Aldhoiena, A., & Al-Amrib, H. (2019). Implementing Enterprise Resource Planning ERP System in a Large Construction Company in KSA. *Procedia Computer Science*, 164, 463–470. doi:10.1016/j.procs.2019.12.207
- Al-Fawaz, K., Eldabi, T., & Naseer, A. (2010). *Challenges and influential factors in ERP adoption and implementation*. Academic Press.
- AlBar, A. M., & Hoque, M. R. (2019). Factors affecting cloud ERP adoption in Saudi Arabia: An empirical study. *Information Development*, 35(1), 150–164. doi:10.1177/0266666917735677
- Albliwi, S., Antony, J., Lim, S. A. H., & van der Wiele, T. (2014). Critical failure factors of Lean Six Sigma: A systematic literature review. *International Journal of Quality & Reliability Management*, 31(9), 1012–1030. doi:10.1108/IJQRM-09-2013-0147
- Amid, A., Moalagh, M., & Ravasan, A. Z. (2012). Identification and classification of ERP critical failure factors in Iranian industries. *Information Systems*, 37(3), 227–237. doi:10.1016/j.is.2011.10.010
- Arachchi, S. M., Chong, S. C., & Kathabi, A. (2019). System Implementation Failures in the ERP Development Process. *Journal of Computer and Communications*, 7(12), 112–127. doi:10.4236/jcc.2019.712011
- Aranyossy, M., Blaskovics, B., & Horváth, Á. A. (2018). How universal are IT project success and failure factors? Evidence from Hungary. *Information Systems Management*, 35(1), 15–28. doi:10.1080/10580530.2017.1416943
- Asiedu, R. O., & Alfen, H. W. (2016). Understanding the underlying reasons behind time overruns of government building projects in Ghana. *KSCE Journal of Civil Engineering*, 20(6), 2103–2111. doi:10.1007/s12205-015-0544-4
- Badewi, A., Shehab, E., Zeng, J., & Mohamad, M. (2018). ERP benefits capability framework: Orchestration theory perspective. *Business Process Management Journal*, 24(1), 266–294. doi:10.1108/BPMJ-11-2015-0162
- Basu, R., & Biswas, D. (2013). An approach to identify failure factors of enterprise application implementation in Indian micro enterprises. *International Journal of Managing Value and Supply Chains*, 4(1), 37–47. doi:10.5121/ijmvsc.2013.4104
- Beheshti, H. M., & Beheshti, C. M. (2010). Improving productivity and firm performance with enterprise resource planning. *Enterprise Information Systems*, 4(4), 445–472. doi:10.1080/17517575.2010.511276
- Bingi, P., Sharma, M. K., & Godla, J. K. (1999). Critical issues affecting an ERP implementation. *IS Management*, 16(3), 7–14.
- Brad, L., Munteanu, A., Dobre, F., & Ciobanu, R. (2013). Quantifying the Romanian banks' performance and the impact of audit inspections upon them when IFRS reporting standards is used. In *Proceedings of the 8th International Conference Accounting and Management Information Systems, AMIS 2013* (pp. 271-283). Academic Press.
- Bramantoro, A. (2018). Erp service for small and medium enterprises in Saudi Arabia. *Indonesian Journal of Electrical Engineering and Computer Science*, 12(1), 69–77. doi:10.11591/ijeecs.v12.i1.pp69-77
- Catherine, C., & Abdurachman, E. (2018). ERP system adoption analysis using TOE framework in Permata Hijau Group (PHG) medan. *International Journal of Enterprise Information Systems*, 14(3), 91–105. doi:10.4018/IJEIS.2018070105
- Chakravorty, S. S., Dulaney, R. E., & Franza, R. M. (2016). ERP implementation failures: A case study and analysis. *International Journal of Business Information Systems*, 21(4), 462–476. doi:10.1504/IJBIS.2016.075256
- Chen, C. C., Law, C. C., & Yang, S. C. (2009). Managing ERP implementation failure: A project management perspective. *IEEE Transactions on Engineering Management*, 56(1), 157–170. doi:10.1109/TEM.2008.2009802
- ChePa, N., & Jasin, N. M. (2018). A Prevention Model for the Failure of Hospital Information Systems in Malaysian Government Hospitals. *Journal of Telecommunication, Electronic and Computer Engineering (JTEC)*, 10(1-10), 67-73.

- Chofreh, A. G., Goni, F. A., Klemeš, J. J., Malik, M. N., & Khan, H. H. (2020). Development of guidelines for the implementation of sustainable enterprise resource planning systems. *Journal of Cleaner Production, 244*, 118655. doi:10.1016/j.jclepro.2019.118655
- Costa, C. J., Ferreira, E., Bento, F., & Aparicio, M. (2016). Enterprise resource planning adoption and satisfaction determinants. *Computers in Human Behavior, 63*, 659–671. doi:10.1016/j.chb.2016.05.090
- De Castro Silva, S. L. F., & de Oliveira, S. B. (2015). Planning and scope definition to implement ERP: The case study of Federal Rural University of Rio de Janeiro (UFRRJ). *Procedia Computer Science, 64*, 196–203. doi:10.1016/j.procs.2015.08.481
- Doom, C., Milis, K., Poelmans, S., & Bloemen, E. (2010). Critical success factors for ERP implementations in Belgian SMEs. *Journal of Enterprise Information Management, 23*(3), 378–406. doi:10.1108/17410391011036120
- Ebad, S. A. (2016). Influencing Factors for IT Software Project Failures in Developing Countries-A Critical Literature Survey. *JSW, 11*(11), 1145–1153. doi:10.17706/jsw.11.11.1145-1153
- Esteves, J., & Bohórquez, V. W. (2007). *An updated ERP systems annotated bibliography: 2001-2005*. Instituto de Empresa Business School Working Paper No. WP, 07-04.
- Fadelelmoula, A. A. (2018). The effects of the critical success factors for ERP implementation on the comprehensive achievement of the crucial roles of information systems in the higher education sector. *Interdisciplinary Journal of Information, Knowledge, and Management, 13*(9), 21–44. doi:10.28945/3942
- Figuerola-Flores, J. R., Acosta-Gonzaga, E., & Ruiz-Ledesma, E. F. (2020). Causes of failure in the implementation and functioning of information systems in organizations. *International Journal of Advanced Computer Science and Applications, 11*(6), 137–142. doi:10.14569/IJACSA.2020.0110618
- Gabryelczyk, R., & Roztock, N. (2017). Effects of BPM on ERP adoption in the public sector. *AMCIS - America's Conference on Information Systems: A Tradition of Innovation*.
- Ganesh, L., & Mehta, A. (2010a). A Survey Instrument for Identification of the Critical Failure Factors in the Failure of ERP Implementation at Indian SMEs. *International Journal of Managing Public Sector Information and Communication Technologies, 1*(2), 10–22.
- Ganesh, L., & Mehta, A. (2010b). Critical failure factors in enterprise resource planning implementation at Indian SMEs. *Asian Journal of Management Research, 1*(1), 44–57.
- Garg, P. (2010). Critical failure factors for enterprise resource planning implementations in Indian retail organizations: An exploratory study. *Journal of Information Technology Impact, 10*(1), 35–44.
- Garg, P., & Garg, A. (2013). An empirical study on critical failure factors for enterprise resource planning implementation in Indian retail sector. *Business Process Management Journal, 19*(3), 496–514. doi:10.1108/14637151311319923
- Garg, P., & Khurana, R. (2017). Applying structural equation model to study the critical risks in ERP implementation in Indian retail. *Benchmarking, 24*(1), 143–162. doi:10.1108/BIJ-12-2015-0122
- Gargeya, V. B., & Brady, C. (2005). Success and failure factors of adopting SAP in ERP system implementation. *Business Process Management Journal, 11*(5), 501–516. doi:10.1108/14637150510619858
- Hasan, N., Miah, S. J., Bao, Y., & Hoque, M. R. (2019). Factors affecting post-implementation success of enterprise resource planning systems: A perspective of business process performance. *Enterprise Information Systems, 13*(9), 1217–1244. doi:10.1080/17517575.2019.1612099
- Jharkharia, S. (2011). Interrelations of Critical Failure Factors in ERP Implementation : An ISM-based Analysis. *3rd International Conference on Advanced Management Science, 19*, 170–174.
- Kanellou, A., & Spathis, C. (2013). Accounting benefits and satisfaction in an ERP environment. *International Journal of Accounting Information Systems, 14*(3), 209–234. doi:10.1016/j.accinf.2012.12.002
- Khanfar, A. A., Mavi, R. K., & Jie, F. (2018). Prioritizing critical failure factors of IT projects with fuzzy analytic hierarchy process. *AIP Conference Proceedings, 2013*(1), 020058. doi:10.1063/1.5054257

- Kheybari, S., Rezaie, F. M., Naji, S. A., Javdanmehr, M., & Rezaei, J. (2020). Evaluation of factors contributing to the failure of information systems in public universities: The case of Iran. *Information Systems*, 92, 101534. doi:10.1016/j.is.2020.101534
- Kholeif, A. O. R., Abdel-Kader, M., & Sherer, M. (2007). ERP customization failure: Institutionalized accounting practices, power relations and market forces. *Journal of Accounting & Organizational Change*, 3(3), 250–269. doi:10.1108/18325910710820292
- Kirmizi, M., & Kocaoglu, B. (2020). The key for success in enterprise information systems projects: Development of a novel ERP readiness assessment method and a case study. *Enterprise Information Systems*, 14(1), 1–37. doi:10.1080/17517575.2019.1686656
- Kohansal, M. A. (2019). Lessons from failure erp implementations. *Norsk Konferanse for Organisasjoners Bruk at IT*, 27(1).
- Kulikov, I., Semin, A., Skvortsov, E., Ziablitchkaia, N., & Skvortsova, E. (2020). Challenges of enterprise resource planning (ERP) implementation in agriculture. *Entrepreneurship and Sustainability Issues*, 7(3), 1847–1857. doi:10.9770/jesi.2020.7.3(27)
- Lozano, J. C., & BayonaOré, S. (2017). Determinant Factors in Post-Implementation Phase of ERP Systems. *International Conference on Software Process Improvement*, (October), 189–200.
- Maditinos, D., Chatzoudes, D., & Tsairidis, C. (2012). Factors affecting ERP system implementation effectiveness. *Journal of Enterprise Information Management*, 25(1), 60–78. doi:10.1108/17410391211192161
- Mahmood, F., Khan, A. Z., & Bokhari, R. H. (2019). ERP issues and challenges: A research synthesis. *Kybernetes*, 49(3), 629–659. doi:10.1108/K-12-2018-0699
- Mahraz, M. I., Benabbou, L., & Berrado, A. (2018). Implementation and management of ERP systems: A literature review. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, 1684–1694.
- Mahraz, M. I., Benabbou, L., & Berrado, A. (2020). A Compilation and Analysis of Critical Success Factors for the ERP Implementation. *International Journal of Enterprise Information Systems*, 16(2), 107–133. doi:10.4018/IJEIS.2020040107
- Mayeh, M., Ramayah, T., & Mishra, A. (2016). The role of absorptive capacity, communication and trust in ERP adoption. *Journal of Systems and Software*, 119, 58–69. doi:10.1016/j.jss.2016.05.025
- Menon, S. A., Muchnick, M., Butler, C., & Pizur, T. (2019). Critical Challenges in Enterprise Resource Planning (ERP) Implementation. *International Journal of Business and Management*, 14(7), 54. doi:10.5539/ijbm.v14n7p54
- Morrisson, M. K. (2020). Best Practice Models for Enterprise Resource Planning Implementation and Security Challenges. *Journal of Business and Management Sciences*, 8(2), 55–60.
- Motiei, M., Zakaria, N. H., Aloini, D., & Sekeh, M. A. (2015). Developing instruments for enterprise resources planning (ERP) post-implementation failure model. *International Journal of Enterprise Information Systems*, 11(3), 68–83. doi:10.4018/IJEIS.2015070105
- Narayanamurthy, G., & Gurumurthy, A. (2017). Revisiting the critical failure factors of ERP to explore their relationships-an ISM based approach. *International Journal of Manufacturing Technology and Management*, 31(6), 554–580. doi:10.1504/IJMTM.2017.089077
- Nawaz, N., & Channakeshavalu, K. (2013). *The impact of enterprise resource planning (ERP) systems implementation on business performance*. Academic Press.
- Noudoostbeni, A., Yasin, N. M., & Jenatabadi, H. S. (2009, April). To investigate the success and failure factors of ERP implementation within Malaysian small and medium enterprises. In *2009 International Conference on Information Management and Engineering* (pp. 157-160). IEEE. doi:10.1109/ICIME.2009.66
- Pan, G., Hackney, R., & Pan, S. L. (2008). Information Systems implementation failure: Insights from prism. *International Journal of Information Management*, 28(4), 259–269. doi:10.1016/j.ijinfomgt.2007.07.001

- Pan, S. L., Newell, S., Huang, J., & Galliers, R. D. (2007). Overcoming knowledge management challenges during ERP implementation: The need to integrate and share different types of knowledge. *Journal of the American Society for Information Science and Technology*, 58(3), 404–419. doi:10.1002/asi.20523
- Peci, M., & Važan, P. (2014). The Biggest Critical Failure Factors in ERP Implementation. *Applied Mechanics and Materials*, 519–520, 1478–1482. doi:10.4028/www.scientific.net/AMM.519-520.1478
- Phaphoom, N., Qu, J., Kheaksong, A., & Saelee, W. (2019). An Investigation of ERP implementation: A Comparative Case Study of SME and Large Enterprises in Thailand. In *International Conference on ICT and Knowledge Engineering* (pp. 1-6). IEEE.
- Prasetyo, S. J., Lubis, M., Witjaksono, R. W., & Azizah, A. H. (2019). Critical Failure Factors in Enterprise Resource Planning (ERP) Implementation: Case Study of PT.Toyota Astra Motor Indonesia. In *2019 Fourth International Conference on Informatics and Computing (ICIC)* (pp. 1-5). IEEE. doi:10.1109/ICIC47613.2019.8985720
- Rahmanimanesh, M., Shafiei Nikabadi, M., Pourkarim, F., & Davoodifar, G. (2017). Using Fuzzy Flowsort Inference System to Rank the Factors Leading to Failure for ERP Projects among Iranian Enterprises. *Journal of Information Technology Management*, 9(4), 787–808.
- Ravasan, A. Z., & Mansouri, T. (2014). A FCM-based dynamic modeling of ERP implementation critical failure factors. *International Journal of Enterprise Information Systems*, 10(1), 32–52. doi:10.4018/ijeis.2014010103
- Renz, S. M., Carrington, J. M., & Badger, T. A. (2018). Two strategies for qualitative content analysis: An intramethod approach to triangulation. *Qualitative Health Research*, 28(5), 824–831. doi:10.1177/1049732317753586 PMID:29424274
- Saadé, R. G., Nijher, H., & Sharma, M. (2017). Why ERP Implementations Fail – A Grounded Research Study. *Proceedings of the Informing Science and Information Technology Education Conference*, 5(31), 191–200.
- Sancar Gozukara, S., Tekinerdogan, B., & Catal, C. (2020). Obstacles of On-Premise Enterprise Resource Planning Systems and Solution Directions. *Journal of Computer Information Systems*, 1–12.
- Sar, A., & Garg, P. (2012). Analysis of critical failure factors in ERP implementation: An Indian experience. *International Journal of Business Information Systems*, 11(3), 360–378. doi:10.1504/IJBIS.2012.049571
- Sar, A., & Garg, P. (2019). The proposed research model for successful ERP implementation in indian manufacturing sector. *International Journal of Supply Chain Management*, 8(5), 20.
- Shang, S., & Seddon, P. B. (2003). A comprehensive framework for assessing and managing the benefits of enterprise systems: The business manager's perspective. *Second-wave enterprise resource planning systems*, 74–101.
- Shaul, L., & Tauber, D. (2013). Critical success factors in enterprise resource planning systems: Review of the last decade. *ACM Computing Surveys*, 45(4), 1–39. doi:10.1145/2501654.2501669
- Spathis, C., & Ananiadis, J. (2005). Assessing the benefits of using an enterprise system in accounting information and management. *Journal of Enterprise Information Management*, 18(2), 195–210. doi:10.1108/17410390510579918
- Sreedharan, V. R., Gopikumar, V., Nair, S., Chakraborty, A., & Antony, J. (2018). Assessment of critical failure factors (CFFs) of Lean Six Sigma in real life scenario: Evidence from manufacturing and service industries. *Benchmarking*, 25(8), 3320–3336. doi:10.1108/BIJ-10-2017-0281
- Sriram, V. P., Kala, P. S., Shanmugasundaram, D., & Arun, A. (2018). An operational perspective on achieving sustainable competitive advantage into a business environment by adapting enterprise resource planning (ERP) system. *International Journal of Mechanical Engineering and Technology*, 9(13), 1682–1689.
- Trinoverly, Y., Handayani, P. W., & Azzahro, F. (2018, September). Analyzing the benefit of ERP implementation in developing country: A state owned company case study. In *2018 International Conference on Information Management and Technology (ICIMTech)* (pp. 75-80). IEEE. doi:10.1109/ICIMTech.2018.8528166
- Tsai, W. H., Chien, S. W., Hsu, P. Y., & Leu, J. D. (2005). Identification of critical failure factors in the implementation of enterprise resource planning (ERP) system in Taiwan's industries. *International Journal of Management and Enterprise Development*, 2(2), 219–239. doi:10.1504/IJMED.2005.006312

- Umar, M., Khan, N., Agha, M. H., & Abbas, M. (2016). Exploring the factors affecting ERP implementation quality. *Journal of Quality and Technology Management*, 12(1), 137–155.
- Virzi, K. (2019b). Examining the Success and Failure Factors of Business Process Reengineering in Africa, Asia, the Middle East, and North America: A Literature Review. *Open Access Library Journal*, 6(9), 1–9. doi:10.4236/oalib.1105722
- Weli, W. (2019). Enterprise resource planning implementation success factor (A case study in atma jaya catholic university of Indonesia). *Journal of Theoretical and Applied Information Technology*, 97(11), 2988–3002.
- Wijaya, R. A., Widyaningrum, P., Prasetyo, B., & Satria, R. (2018). Analyzing of Implementation Enterprise Budgeting System Using SAP BPC: Case Study on a Financial Government Institution. In *2018 International Conference on Advanced Computer Science and Information Systems (ICACSIS)* (pp. 475-480). IEEE. doi:10.1109/ICACSIS.2018.8618253
- Wijaya, S. F., Prabowo, H., & Kosala, R. (2017). Identification of key success factors and challenges for erp systems-A systematic literature review. *Proceedings - 2017 International Conference on Applied Computer and Communication Technologies (ComCom)*, 1-6. doi:10.1109/COMCOM.2017.8167091
- Wong, A., Scarbrough, H., Chau, P., & Davison, R. (2005). Critical failure factors in ERP implementation. *9th Pacific Asia Conference on Information Systems: I.T. and Value Creation, PACIS 2005, Proceedings*, 40.
- Zainol, Z., Fernandez, D., & Ahmad, H. (2017). Public sector accountants' opinion on impact of a new enterprise system. *Procedia Computer Science*, 124, 247–254. doi:10.1016/j.procs.2017.12.153
- Zare Ravasan, A., & Mansouri, T. (2016). A dynamic ERP critical failure factors modelling with FCM throughout project lifecycle phases. *Production Planning and Control*, 27(2), 65–82. doi:10.1080/09537287.2015.1064551
- Zerbino, P., Aloini, D., Dulmin, R., & Mininno, V. (2017). Framing ERP success from an information systems failure perspective: A measurement endeavor. *Journal of Electronic Commerce in Organizations*, 15(2), 31–47. doi:10.4018/JECO.2017040103