



Proposed Risk Diagnosing Methodology for ERP Implementation Project in SMEs

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Abstract

The implementation of ERP projects is a specific case of information system projects that require modifying pre-produced software according to the condition specified for an organization to fulfill particular benefits. ERP systems adoption is a complicated, lengthy, risky, and costly process for all sizes of organizations that usually faces critical failures and challenges. Especially for SMEs with limited capabilities and resources, they lack the experience of requirement specification and ERP implementation. This failure could be costly and may cause corporate bankruptcy. This study proposes a Risk Diagnosing Methodology for implementing ERP projects in SMEs (RDMERP). The proposed methodology is systematic and a global road to proactively identify, assess, analyze, and treat the various risks associated with any ERP implementation through all the phases for protecting the SMEs' assets and mission and meeting the ERP project objectives.

Keywords: Enterprise Resource Planning, Small-and-Medium-Sized Enterprises, Risk Management.

1. Introduction

SMEs play essential role in a country's economy, they strives to keep up with modern trends of technology. Obviously they need to implement comprehensive application or technology such as ERP [1]. In spite of ERP systems implementation provides benefits to SME, the studies indicated that ERP systems implementations have high rates of failure[2], [3]. ERP systems are complex, extended and over budget, many of them are discarded, modified, scaled, realized partial implementation only, are terminated before completion, or failed to meet organization's business objectives after implementation.

SMEs that adapt ERP systems facing risks different from larger enterprises[4]. [5], [6] estimated that between 70% and 85% of implementations of ERP fail according to cost, fit, or schedule overruns. [7] announced that how organizations lost millions after they implemented a new ERP software. [8], [9]stated that organizations like FoxMeyer Drugs and Shane Co. have been bankrupt due to failure of ERP implementations.

[10] stated that the risk of information system project arise in two primary areas, the first is system development, such as incorrect definition of user objectives, the improper perception of the system, the imperfect of organization view, the difficulty of predicting the system impact, and etc. the other is use of the system, includes the failure of use adequate technical solutions, inability to gather and preserve relevant data, authority changes or work scope changes, and etc.. Risks in ERP projects engenders in each implementation stages of ERP project[11].

Since ERP system adoption is a challenge project in SMEs; it is essential to proactively identify and mitigate the various risks associated with the implementation process. By using risk management, SMEs can make better decisions towards ERP implementations. The main objective of this study is to propose Risk Diagnosing Methodology for implementing the ERP projects in SMEs (RDMERP) so as to proactively identify, assess, analyze, and treat the diverse risks associated with any ERP implementation through all the phases for protecting the SMEs' assets and mission and meeting the ERP project objectives. Furthermore it supports SMEs to discover their weaknesses in implementing their ERP project and develop needful learning and rise their capabilities to implement their ERP project successfully.

The paper is organized as follows. First, it presented the role of SMEs and its needs to implement ERP system followed by criteria for successful ERP implementation in SME. The proposed RDMERP is then outlined, with specifics of each step and how each step could be used. Finally, the paper concludes with findings and future directions.

2. Role of SMEs

SMEs play essential role in a country's economy, they create jobs, produce and equitably distribute income and contribute to exports. SMEs can provide the basic products either for masses or for exports. SMEs can distribute the wealth and income in an equal way. The small scale sectors provide more opportunities for tolerable and capable entrepreneurs. They mitigate the imbalance problem in the payment accounts balance by promoting export. As small units can use resources more efficiently to the full capacity without any wastage, they may in SMEs can allocate the resources in efficient way with considerable number of workforce without any loss. [12]–[16]

3. Why SME needs to implement ERP?

Enterprise resource planning (ERP) systems are extensive and universal packaged information systems (IS) to integrate and automate traditional functions and business processes such as procurement, finance, human resources, accounting, and sales[17], [18]. Instead of utilizing independent application for each department, it is better conception for SMEs to adapt ERP application that manages all functionalities in an integrated manner. SME need to implement ERP in order to utilize and manage the organization's resources by providing an integrated and comprehensive solution to meet the information-processing needs of the organization. ERP improves the quality and speed of decision making, provides centralized database which contains all information from all organization's department that can be accessed and shared by everyone to reduce the error and improve the accuracy of data, reduces the operational cost, enhances the accountability and transparency, increase the productivity, increase the business process efficiency, encourage competitive advantage, monitor the business performance, improve the management and communication, and reduce the employees' work load[19].

There are different customizations in ERP systems to meet the scale and matric of operations in varies organizations [20]. This is a significant reason that makes the implementation of ERP in SMEs is conceivable. On the other hand, ERP implementations enhance efficiency in overall organizations performance.

4. The key criteria for successful ERP implementation in SME

[1], [21], [22]stated that the key criteria that can affect ERP implementations failure or success in SMEs. These criteria are listed below.

4.1 Project accomplishment in presupposed Budget

This criteria is very pivotal because over budgeting causes possibility risk for the organizations seeking to implement ERP. So, exceeding the presupposed budget can cause stress on the implementation team to decrease the cost for downward phases.

4.2 Project accomplishment in particular Timeframe

If ERP is not executed in specific time, it can cause monetary problems to the organization and it also delays organizations performance and ERP implementation returns.

4.3 Fulfillment of tremendous commercial Benefits

When any SME decide to implement ERP, it desires for paradigm shift in business benefits. The promises made in the sales representation of ERP software package for SMEs can be fulfilled if the ERP is executed in the timely manner with presupposed budget.

5. The proposed Risk Diagnosing Methodology for ERP project (RDMERP) in SMEs

There are various studies that attempted to identify risk factors in ERP project (Aslanyan, 2017; Shukla et al., 2016; Chong & Lakshanthi, 2015; Dey et al., 2009; Kittlaus et al., 2004), other research tried to suggest methods to assess the ERP risk [10], [28]–[33]. On the other hand, several researchers have built framework to manage the ERP risk [2], [10], [32], [34]–[39]

5.1 Research Methodology

According to the models from prior models suggested by previous researches, The Risk Diagnosing Methodology for implementing the ERP projects in SMEs (RDMERP) was proposed to proactively identify, assess, analyze, and treat the diverse risks associated with any ERP implementation through all the phases for protecting the SMEs' assets and mission and meeting the ERP project objectives. Furthermore it supports SMEs to discover their weaknesses in implementing their ERP project and develop needful learning and rise their capabilities to implement their ERP project successfully.

This methodology is proposed based on the literature review of articles on Risk Management for ERP implementation in SMEs that gathered from several sources in certain range of publication years (2005-2020).

5.2 Proposed RDMERP Components

The proposed RDMERP consists of seven steps as shown in Figure 1.

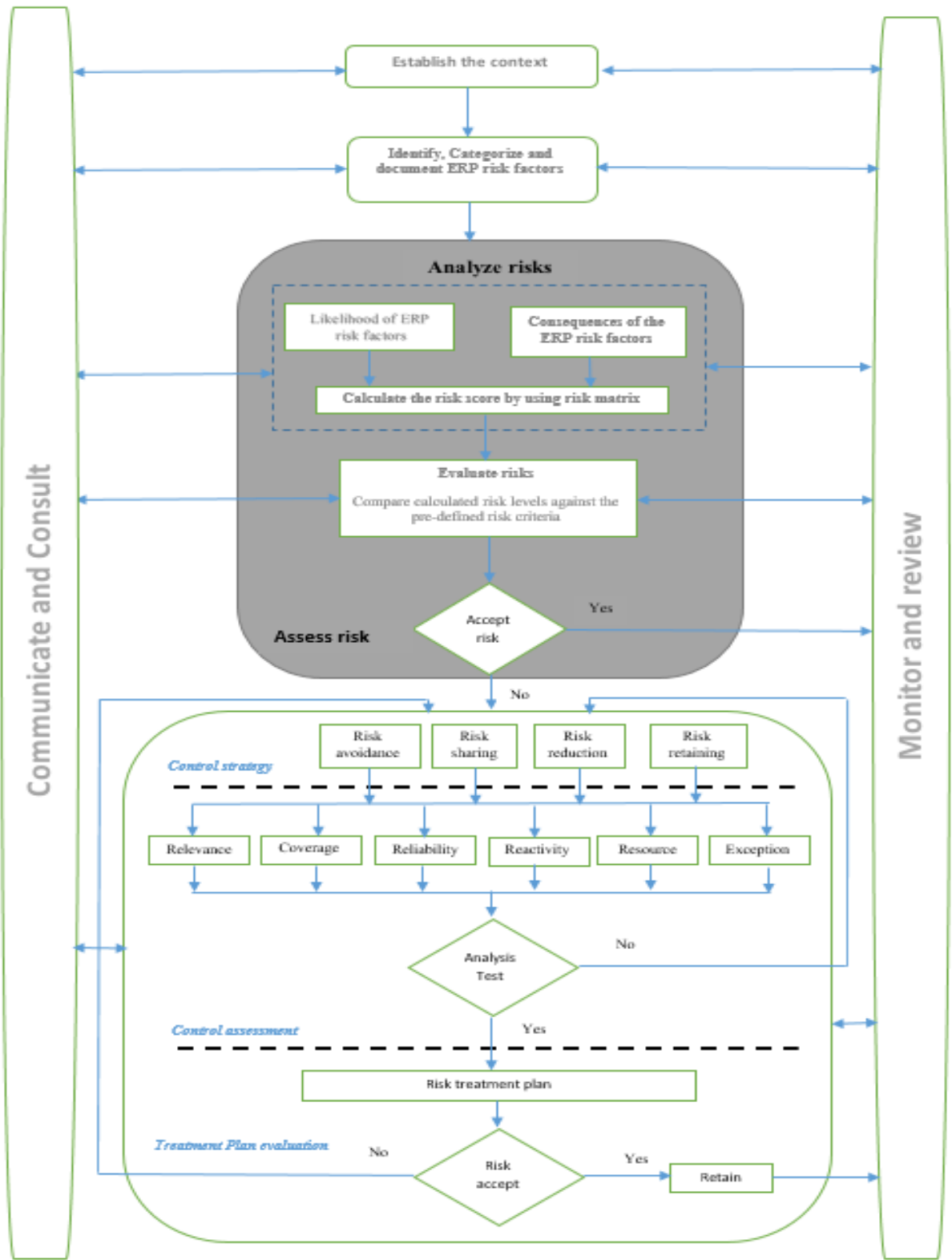


Figure 1: The proposed Risk Diagnosing Methodology for ERP (RDMERP) in SMEs

5.2.1 Step 1: Communicate and consult

The objectives of Communication and consultation step is to determine who will be engaged in identification, analysis and evaluation, treatment, monitoring and review of risk. The risk management process includes a diverse set of stakeholders – each of them play an essential role in risk management process with varies roles and authority levels. They are namely, the project Management Office (PMO) Risk Manager, the Work Package Managers, The Release/Area Manager, and the project Manager[34].

5.2.2 Step 2: Establish the Context

Risks are uncertainties which affect the accomplishment of organization's objectives, so risks can't be perfectly identified if the organization's objectives and strategies are ambiguous. According to [40], before starting a risk identification process in ERP project, it is significant to define the organizational, strategic, internal and external context of risk management and identify the boundaries and parameters for ERP project to ensure that all critical risks are identified. This boundaries and parameters involves

- Define the organization's scope and objectives,
- Determine timeframe for adapting ERP,
- Define resources desired,
- Assign the responsibilities and roles for each participant,
- Define the organization's regulations and legislation,
- Decide if external expertise required.
- Clarify Internal and external relationships with other projects or stakeholders
- Define risks types related with ERP implementation
- Define possible consequence of identified risk
- Establish the risk standard" the acceptable level of risk for a specific activity or event."

5.2.3 Step 3: Identify the risk

Risk identification is the elementary, initial and primary step in the whole risk management process. It needed continuously to be carried out in each phase during the entire lifecycle of an ERP project in different dimensions and sections, from different points of view and in different field to guarantee that the overall list of tolerable risks that related with ERP implementation and it might affect the business's objectives in a negative or positive way of ERP project can be combined. It is critical that there are specific information needs to be taken into account and must be collected during the ERP risk identification process, such as What are the sources of risk or threat, when, where, how, causes, business consequences, business stakeholders affected and existing controls. Table 1 summarizes the risk factors during the various phases of ERP implementations. [10], [33], [41]–[45]

The following steps are essential to identify ERP risks effectively from SMEs:

1. Identifying ERP risk factors during each phase in ERP project;
2. Categorizing the identified ERP risks;
3. Gathering information from various sources to identify ERP risks;
4. Applying risk identification techniques;
5. Documenting the risks and the risk identification process.

Table 1: ERP risk factors

ERP phases	Risk factors
Project Preparation	<ol style="list-style-type: none"> 1. Inaccurate business case 2. Buying a wrong kind of a system, 3. Choosing poor project manager or project team 4. Weak implementation team 5. Unclear objectives 6. Having too little knowledge of making a proper contract 7. Poor integration of new system to remaining systems 8. Lacking top management support to the greatest risks. 9. Choosing improper ERP system 10. Special needs of a company are not defined 11. An ERP system is poor compromise for all stakeholders 12. Selecting improper project manager or project team 13. Misunderstandings between a buyer and a customer
Business blueprint	<ol style="list-style-type: none"> 1. Normal business disturbs ERP project activities 2. ERP project disturbs normal business 3. Cost rise compared to initial estimations 4. Supplier don't understood the customer needs 5. Timetable falls behind schedule 6. Conflicts between organization and consultants/vendor 7. Inadequate expectations management 8. Internal conflicts between department
Realization	<ol style="list-style-type: none"> 1. Poor top management support 2. Lack of management commitments and leadership 3. IT technical issues 4. A company's project manager is not a full time PM 5. Data transfers from old to new system is difficult 6. Connecting an ERP system to other IT systems creates problems 7. ERP supplier is not committed enough to the ERP system implementation 8. Software configuration and testing don't function swiftly 9. Disciplined use of the ERP system (data entry is not achieved) 10. A supplier is not committed enough to system implementation 11. Company is not important customer for supplier and don't get the best effort 12. A supplier don't understood the customer needs
Final preparation	<ol style="list-style-type: none"> 1. Inappropriate management of scope 2. Insufficient training of end-user 3. Business process reengineering incompetence 4. ERP installation incompetence 5. Inappropriate selection of ERP software 6. Inappropriate system integration 7. Inaccurate performance data 8. Lack of communication between ERP implementation team, ERP provider and ERP users Poor contract management
Go live & support	<ol style="list-style-type: none"> 1. All needed information is not entered into the system 2. Inappropriate users training 3. Inappropriate system testing and commissioning 4. Only part of the system used and benefits realized

	<ol style="list-style-type: none"> 5. The poor requirements specification phase 6. Lack of documentations in the implementation phase related to configuration and parameterization. 7. The key person of the ERP vendor shifted to another company middle of the project. 8. An ERP system not used in a disciplined manner 9. ERP system is not felt as helping the business 10. The system supplier does not develop the system in the future. 11. Inappropriate contract closeout 12. Inadequate organizational readiness 13. Resistance to change 14. Multi-site issues 15. Lack of clarity on inspection and maintenance 16. Inaccurate performance measurement and management framework 17. Over-reliance on heavy customization 18. Poor consultant effectiveness 19. Too tight project schedule
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5.2.4 Step 4: Risk analysis

Risk analysis includes analyze the probability of identified risks and potential impact for guiding risk responses.

The following steps are essential to analysis ERP risks effectively from SMEs:

1. Determine the consequences of the ERP risk factors
2. Prioritize the consequences of ERP risk factors with the level of severity
3. Calculate the risk score by using risk matrix
4. Realize existing Controls

5.2.4.1 Determine the consequences of the ERP risk factors

The ERP risk factors may affect in different areas, to a major or lower degree. The consequences level of ERP risk event may be analyzed from (1 to 5) as defined in table 2.

Table 2: Consequence Rating Table

level	Rating	Description
1	Catastrophic	The tasks plan needed to change by task manager
2	Major	Implementation delays doesn't affect project schedule or budget.
3	Moderate	Schedule or budget of project will increase and the project plan should be corrected necessary.
4	Minor	Project objectives is not achieved. Time and cost of Project increases
5	Insignificant	Negative impacts on the whole organization.

5.2.4.2 Prioritize the consequences of ERP risk factors with the level of severity

In this step the “likelihood” or “probability “or “frequency “of an ERP risk occurring. It is a personal classification but in many cases, the classification may be based on prior events, environmental survey and comprehensive understanding of business process by skilled persons with specialist knowledge in the process of risk analysis. Table 3 indicates consequence likelihood on project tasks.

Table 3: Consequence likelihood table

Level	Rating	Rating Description	likelihood
1	Rare	Possible but not predicted to happen during ERP life cycle	<5%
2	Unlikely	Possible it may happen once through the ERP life cycle	5-10%
3	Moderate	It may happen more than twice through the ERP life cycle	10-25%
4	Likely probability	it may occur repeatedly through the ERP life cycle	25-50%
5	Almost Certain	It may be routinely happen through the ERP life cycle	>50%

5.2.4.3 Calculate the risk score by using risk matrix

The score of Risk is calculated by multiplying the ratings of consequence and likelihood of ERP factors as presented in table 4. Each ERP risk factor may has varies consequence and likelihood scenarios within varies risk categories, so, it is critical to assess the worst-case scenario where, the highest multiplier should be selected as the final evaluation.

Table 4: Risk matrix

Consequences (C)	Likelihood (L)				
	Rare	Unlikely	Possible	Very Likely	Certain to Occur
Catastrophic	moderate	moderate	high	critical	critical
Major	Low	moderate	moderate	high	critical
Moderate	Low	moderate	moderate	moderate	high
Minor	very low	low	moderate	moderate	moderate
Insignificant	very low	very low	low	low	moderate

5.2.4.4 Realize existing Controls

A control is any action that the administration takes to manage risk and to reinforce the chance that goals will not be met. According to [46], Controls can be categorized into several ways to help us to understand the target of the control. Controls can be Preventive, Corrective / Detective or Directive controls. It can also be Formal strict or Informal Soft controls. On the other hand, controls may be Technological (Automated) or Manual controls:

5.2.5 Step 5: Evaluate the risks

It is critical to determine the severity of risks to the business. The stockholders must define the risk level that the organization is ready to accept. The purpose or risk evaluation is to compare the current risk level calculated through the process of analysis with predefined risk criteria, and determine if these risks are acceptable or require treatment. The risk is 'acceptable' if the risk level is low or the treating cost of the risk will over balance the benefit, or there is no rational treatment strategy that can be implemented. This is famed as ALARP, an abbreviation for 'As Low as Reasonably Practicable'.

The risk evaluation output is a priority list of risks that require treatment action. This step help to decide which risks are acceptable or require treatment.

5.2.6 Step 6: Treat the risk

The aim of risk treatment is to identify treatment or controlling strategies for addressing risk that weren't deemed tolerable or acceptable through the previous step, with the purpose of reduction or elimination of negative consequences, or reduction of the probability of risk occurrence or enhancement of positive result. According to [47], there are several a risk treatment strategy

- **Risk avoidance:** this strategy is selecting when the controlling measures are non-existence or can't reduce the risk to tolerable or acceptable level, so the risk must be avoided.
- **Risk sharing:** in this strategy the risk is transferred to other party such as insurance company or consultant to share responsibilities.
- **Risk reduction:** this strategy try to reduce the consequence or probability of risk occurrence to the tolerable or acceptable level.
- **Risk retaining:** The risk is 'acceptable' if the risk level is low or the treating cost of the risk will over balance the benefit, or there is no rational treatment strategy that can be implemented

The following steps are essential to treat ERP risks effectively from SMEs

1. Determine suitable treatment strategies
2. Conduct treatment /control assessment analysis
3. Risk treatment plan

5.2.7 Step 7: Monitor and review

Monitor and review is a fundamental and complementary step in the process of risk management. Risks must be monitored periodically to

- Check the risk treatment plan effectiveness
- Ensure that variable circumstances don't modify the priority of the risk
- To capture new risks and managed it timely and effectively

6. Conclusion

Global economy and the rise of e-business represent challenges that must be met by SMEs. ERP system provides several advantages to SMEs to overcome operational difficulties and enhances cooperation among various functions results in lower cost production, higher quality of product and service, higher customer satisfaction and increase market share. Although there are several advantages in implementing ERP systems, some of the ERP systems failed to deliver the required results. These failures are due to poor risk management and poor implementation of ERP systems. In order to reduce the risk of ERP implementation, certain authors recommend a risk management plan that is initiated at the implementation phase of the system's lifecycle. So, this study provided proposed methodology to proactively identify, assess, analyze, and treat the diverse risks associated with any ERP implementation through all the phases for protecting the SMEs' assets and mission and meeting the ERP project objectives. This methodology also supports SMEs to discover their weaknesses in implementing their ERP project and develop needful learning and rise their capabilities to implement their ERP project successfully.

Reference

- [1] T. Kiran and A. Reddy, "Critical success factors of ERP implementation in SMEs," *J. Proj. Manag.*, vol. 4, no. 4, pp. 267–280, 2019.
- [2] P. Iskanius, "Risk Management in ERP Project in the Context of SMEs.," *Eng. Lett.*, vol. 17, no. 4, 2009.
- [3] D. Saxena, B. Dempsey, and J. McDonagh, "Beyond the One-dimensional Construct of Failure: the Curious Case of Enterprise Systems Failure rates.," in *UKAIS*, 2016, p. 38.
- [4] C. J. Stefanou, "Adoption of free/open source ERP software by SMEs," in *Information Systems for Small and Medium-sized Enterprises*, Springer, 2014, pp. 157–166.
- [5] A. Zararavasan and T. Mansouri, "A dynamic ERP critical failure factors modelling with FCM throughout

- project lifecycle phases,” *Prod. Plan. Control*, vol. 27, Jul. 2015, doi: 10.1080/09537287.2015.1064551.
- [6] P. Sudhaman and C. Thangavel, “Efficiency analysis of ERP projects—software quality perspective,” *Int. J. Proj. Manag.*, vol. 33, no. 4, pp. 961–970, 2015.
- [7] N. Y. Conteh and M. J. Akhtar, “Implementation challenges of an enterprise system and its advantages over legacy systems,” *Int. J. Comput. Sci. Eng.*, vol. 7, no. 11, p. 120, 2015.
- [8] M. Haddara and T. Hetlevik, “Investigating the effectiveness of traditional support structures & self-organizing entities within the ERP shakedown phase,” *Procedia Comput. Sci.*, vol. 100, pp. 507–516, 2016.
- [9] L. A. Joia, D. G. de Macêdo, and L. G. de Oliveira, “Antecedents of resistance to enterprise systems: The IT leadership perspective,” *J. High Technol. Manag. Res.*, vol. 25, no. 2, pp. 188–200, 2014.
- [10] D. Aloini, R. Dulmin, and V. Mininno, “Risk management in ERP project introduction: Review of the literature,” *Inf. Manag.*, vol. 44, no. 6, pp. 547–567, 2007.
- [11] E. A. Khvalev, “Key characteristics in ERP implementation projects: conceptual model for analysis,” in *Proceedings of the 4th Conference on Theory and Practice of Modern Science, Moscow, Russia*, 2010, vol. 30, p. 31.
- [12] S. Hashi, “Role of Small and Medium Enterprises In Economic Development.” 2019.
- [13] M. C. Antero, *A Multi-case Analysis of the Development of Enterprise Resource Planning Systems (ERP) Business Practices*. Frederiksberg: Copenhagen Business School (CBS), 2015.
- [14] J. Branch, “The role of enterprise resource planning (ERP) for small and medium enterprises (SMEs),” *Res. J. Appl. Sci. Eng. Technol.*, vol. 5, no. 7, pp. 2317–2320, 2013.
- [15] V. Tsamantanis and H. Kogetsidis, “Implementation of enterprise resource planning systems in the Cypriot brewing industry,” *Br. Food J.*, 2006.
- [16] P. Helo, P. Anussornnitisarn, and K. Phusavat, “Expectation and reality in ERP implementation: consultant and solution provider perspective,” *Ind. Manag. Data Syst.*, 2008.
- [17] C. J. Costa, E. Ferreira, F. Bento, and M. Aparicio, “Enterprise resource planning adoption and satisfaction determinants,” *Comput. Human Behav.*, vol. 63, pp. 659–671, 2016.
- [18] F. Tasevska, T. Damij, and N. Damij, “Project planning practices based on enterprise resource planning systems in small and medium enterprises—A case study from the Republic of Macedonia,” *Int. J. Proj. Manag.*, vol. 32, no. 3, pp. 529–539, 2014.
- [19] L. Aversano, M. Di Brino, D. Guardabascio, M. Salerno, and M. Tortorella, “Understanding enterprise open source software evolution,” *Procedia Comput. Sci.*, vol. 64, pp. 924–931, 2015.
- [20] M. B. BAKER and Z. YOUSOF, “FACTORS INFLUENCING KNOWLEDGE SHARING IN ENTERPRISE RESOURCE PLANNING SYSTEM USAGE IN SMALL AND MEDIUM ENTERPRISES.,” *J. Theor. Appl. Inf. Technol.*, vol. 95, no. 8, 2017.
- [21] S. Saini, S. Nigam, and S. C. Misra, “Identifying success factors for implementation of ERP at Indian SMEs: A comparative study with Indian large organizations and the global trend,” *J. Model. Manag.*, 2013.
- [22] J. G. Rosario, “On the leading edge: critical success factors in ERP implementation projects,” *Bus. World*, vol. 17, no. May, pp. 15–29, 2000.
- [23] H.-B. Kittlaus, C. Rau, and J. Schulz, “Software-Produkt-Management,” *Nachhalt. Erfolgsfaktor bei Herstellern und Anwendern, Berlin*, 2004.

- [24] P. K. Dey, D. Bennett, and B. Clegg, "Managing risk in enterprise resource planning projects," 2009.
- [25] S. Shukla, P. K. Mishra, R. Jain, and H. C. Yadav, "An integrated decision making approach for ERP system selection using SWARA and PROMETHEE method," *Int. J. Intell. Enterp.*, vol. 3, no. 2, pp. 120–147, 2016.
- [26] A. Aslanyan, "Risks in ERP projects implementation: How communication and business processes re-engineering risks effect ERP projects." 2017.
- [27] S.-C. Chong and A. Lakshanthi, "LITERATURE BASED REVIEW -RISKS IN ERP SYSTEMS INCLUDING ASIAN COUNTRIES Samantha Mathara Arachchi #1," *Eur. J. Comput. Sci. Inf. Technol.*, vol. 3, pp. 1–14, Apr. 2015.
- [28] T. S. Kiran and A. V. D. Reddy, "Evaluating critical success factors of ERP implementation in SMEs," *Int. J. Recent Technol. Eng.*, vol. 8, no. 2, pp. 1144–1149, 2019.
- [29] K. Srinivas, "Process of Risk Management," in *Perspectives on Risk, Assessment and Management Paradigms*, IntechOpen, 2019.
- [30] G. Thangamani, "Modified Approach to Risk Assessment-A Case Study on Product Innovation and Development Value Chain," *Int. J. Innov. Manag. Technol.*, vol. 7, no. 1, p. 16, 2016.
- [31] R. Nafkha and D. Strzëciwilk, "Risk assessment for ERP system implementation," *Inf. Syst. Manag.*, vol. 3, 2014.
- [32] P. K. Dey, B. Clegg, and W. Cheffi, "Risk management in enterprise resource planning implementation: a new risk assessment framework," *Prod. Plan. Control*, vol. 24, no. 1, pp. 1–14, 2013.
- [33] P. Dey, B. Clegg, and W. Cheffi, "Risk management in enterprise resource planning implementation: A new risk assessment framework," *Prod. Plan. Control - Prod. Plan. Control*, vol. 24, pp. 1–14, Jan. 2011, doi: 10.1080/09537287.2011.597038.
- [34] P. K. Dey, B. Clegg, and W. Cheffi, "11 Risk management in enterprise resource planning implementation," *Risk Manag. Eng. Constr. Tools Tech.*, p. 205, 2019.
- [35] D. Aloini, R. Dulmin, and V. Mininno, "Risk Management in Enterprise Resource Planning Systems Introduction," in *Handbook On Business Information Systems*, World Scientific, 2010, pp. 297–320.
- [36] H. Y. Ching and T. M. Colombo, "Enterprise risk management good practices and proposal of conceptual framework," *J. Manag. Res.*, vol. 6, no. 3, p. 69, 2014.
- [37] A.-L. PRIOTEASA, C. N. CIOCOIU, A. CHITIMIEA, and V. R. VĂDUVA, "Quantitative Approach to The Implementation of Risk Management In Operating Activities of Romanian SMEs," 2020.
- [38] P. M. Institute, "Practice standard for project risk management," 2009.
- [39] D. ALOINI, "Risk Management in ERP introduction projects," 2008.
- [40] K. Sadgrove, *The complete guide to business risk management*. Routledge, 2016.
- [41] M. Ojala, I. Vilpola, and I. Kouri, "Risks and risk management in ERP Project-cases in SME Context," in *Business Information Systems–9th International Conference on Business Information Systems (BIS 2006)*, 2006.
- [42] A. Wong, H. Scarbrough, P. Chau, and R. Davison, *Critical Failure Factors in ERP Implementation*. 2005.
- [43] T. M. Somers and K. G. Nelson, "A taxonomy of players and activities across the ERP project life cycle," *Inf. Manag.*, vol. 41, no. 3, pp. 257–278, 2004.

- [44] V. Kumar, B. Maheshwari, and U. Kumar, "An investigation of critical management issues in ERP implementation: emperical evidence from Canadian organizations," *Technovation*, vol. 23, no. 10, pp. 793–807, 2003.
- [45] S. S. Ariss, T. S. Raghunathan, and A. Kunnathar, "Factors affecting the adoption of advanced manufacturing technology in small firms," *SAM Adv. Manag. J.*, vol. 65, no. 2, p. 14, 2000.
- [46] U. Hussaini, A. A. Bakar, and M.-B. O. Yusuf, "The effect of fraud risk management, risk culture and performance of banking sector: A conceptual framework," *Int. J. Multidiscip. Res. Dev.*, vol. 6, no. 1, pp. 71–80, 2019.
- [47] N. Ekwere, "Framework of effective risk management in small and medium enterprises (SMESs): a literature review," *Bina Ekon.*, vol. 20, no. 1, pp. 23–46, 2016.