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An extension of the diffusion of innovation theory for business intelligence adoption: A maturity perspective on project management

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A B S T R A C T

This study's objective is to analyze the factors that influence whether or not small and medium-sized enterprises (SMEs) use business intelligence. Based on an exhaustive assessment of the literature, the study offers a model dependent on the diffusion of innovation and augmented with factors expressing the idea of project management maturity (PMM). The research applied structural equation modelling (SEM) to examine data obtained from 112 Jordanian company workers. The findings showed that the adoption of business intelligence has a positive and significant relationship to the complexity, compatibility, and relative advantage of business intelligence; the level of project management maturity has a significant effect on the level of relative advantage, compatibility, and complexity; and the level of project management maturity is significantly associated with the change management and knowledge sharing practices in SMEs. However, we contend that further study has to be carried out, particularly in the context of developing nations, in order to get a comprehensive understanding of how different SMEs may effectively deploy and make use of business intelligence.

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1. Introduction

Business intelligence (BI) is among the most important technologies, systems, processes, and tools that assist businesses in achieving a more comprehensive knowledge of their business data, subsequently enabling them to increase their competitive advantage, processes, and product development (Mirjana et al., 2017), and fortify their connections with their consumers. BI's significance in SMEs grows since it aids professionals and managers in making more informed, timely, and appropriate decisions. However, to improve the SMEs' profitability and efficiency and to comply with the many environmental and regulatory aspects of this industry (Alzoubi et al., 2022), several firms are currently increasing their investment in deploying different kinds of information systems, including enterprise resource planning and customer relationship management (Jain & Kanungo, 2005), with the idea that these expenditures would enhance staff productivity. The implementation of a successful strategy with the substantial use of technology is in keeping with BI's current status as an important topic and a necessary requirement for developing a memorable corporate identity. Furthermore, in today's dynamic economy, where allocating massive expenditures to R&D necessitates extraordinary efforts, this facilitates decision-making and achieves a competitive advantage. Since data can be analyzed quickly and effectively to back up potentially disastrous events and choices (Hou, 2012), their impact on businesses' bottom lines is substantial. BI is a general term that comprises structures, applications, databases, tools, and processes for analyzing data by organizing the data into relevant and useful information to enhance business managers' decision-making. The use of many business ideas and analytics, applications, and technologies, such as decision-support systems, data warehousing, and data mining, is typically great in SMEs' areas including retention, electronic

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banking, risk assessment, customer segmentation, and branch performance (Nithya & Kiruthika, 2022). For this reason, senior management has to maintain a consistent focus on finding solutions to difficult challenges and grabbing opportunities if the banking industry is going to thrive and prosper in the modern business climate (Acheampong, 2017). This necessitates computerized assistance for managerial decision-making, meaning a requirement for decision-making, BI, and analytics solutions. Data analytics may help in addressing and growing SMEs' challenges and attaining the best outcomes for decision-making. A manager's inability to recognize patterns in massive amounts of business data is a result of the data's sheer volume, which is continually growing (Mahmood et al., 2019). In addition, managers require additional effort in order to arrive at a conclusion about the pattern of behavior as well as the desires and requirements of clients. Furthermore, there are a great deal of extra tasks that require being completed to comprehend and keep the appropriate clients and also acquire new customers. Because of this, business intelligence helps managers and product managers discover distinct groups of clients, produce goods or services that are matched with customer wants, improve overall customer satisfaction, identify the competitors and the price plan, strengthen revenue management, boost sales, and broaden the client base (Jain & Kanungo, 2005). Research studies have characterized BI as the capacity of companies to think, plan, forecast, solve issues, comprehend, invent new methods to enhance SMEs and decision making procedures correctly, allow successful actions (Pejić-Bach, Zoroja, & Čeljo, 2016), and assist in the creation and achievement of corporate objectives. The proclivity to adopt and accept BI varies according to enterprise size and location (country) (Jalil et al., 2019). In this sense, bigger organizations tend to outperform SMEs in terms of the uptake and use of BI for business operations and activities. (Ifinedo, 2010; Al-Qirim, 2007; Alzoubi et al., 2022). As well, the diffusion of BI in organizations differs significantly between developing and developed countries (Mikroyannidis & Theodoulidis, 2010; Hou, 2012). In addition to inconsistent outcomes, the available research does not give sufficient proof of the elements that influence the adoption of BI. Current research on BI adoption is limited, with one of the few examples being a study by Hou (2012) that focuses on the use of BI by SMEs. Other examples concentrate on BI components, including online analytical processing and data mining (Mohammad et al., 2022; Al-Okaily et al., 2022). Consequently, this research aims to present and empirically test a framework for studying the determinants of BIs' acceptability in SMEs by expanding the Diffusion of Innovation (DOI) theory, which several IS experts have used to investigate similar elements. The objective is to develop a normative model that extends the fundamental DOI model by integrating factors that reflect the idea of project management maturity in SMEs.

The next section provides a summary of the major relevant literature. In Section 3, data collection and methods are described, while Section 4 contains the study's findings. Section 5 includes the scientific contributions, together with the conclusion, limitations, and prospects for study.

2. Literature review

2.1 Business Intelligence

Nowadays, information is a crucial competitive aspect for modern businesses. Modern companies produce vast amounts of data. It is crucial to assist strategic, operational, and tactical decision-making by providing the proper people with information that is thorough, accurate, timely, and relevant (Popovič et al., 2012; Mirjana et al., 2017). Consequently, the translation of usable information into knowledge increases a company's competitive advantage. BI is a set of analytical methods, such as data mining, for getting information out of data (Mohammad et al., 2022). BI allows firms to boost competitiveness and revenue, establish new strategies, and make sound choices by analyzing an organization's performance. The term “Bis” refers to a data driven decision making support system that integrates information technology used for data collection, storage, and analysis, with the primary goal of delivering business-driven and results-oriented information. BI is a collection of technologies for transforming data into actionable information (Bahram et al., 2012; Aruldoss et al., 2014).

2.2 Technological attributes

According to Ramdani et al. (2009), the adoption of BI by SMBs can be viewed as innovative. Innovation is something novel to the adopting organization (Damanpour, 1992). Roger (1995) contends that the diffusion and acceptance of new technologies depend on five main factors: observability, complexity, compatibility, trialability, and relative advantage. Tornatzky and Klein (1982) evaluated the Rogers' innovation characteristics and found that compatibility, relative advantage, and complexity had the strongest links with uptake across a wide variety of innovation strategies. Thus, this research will use these three attributes of advances in BI adoption among SMEs (Tornatzky & Klein, 1982; Lee, 2004; Chokri, 2010). Rogers (1995) defines relative advantage as “the extent to which an invention is seen to be superior to the concept it supplants”. Therefore, if the advantages of the technical innovation are judged to be superior to those of current practises and systems, the adoption of such an invention will be promoted. In previous studies (Ramdani et al., 2009; Ifinedo, 2010; Mahmood et al., 2019; Arif, 2019), this component was shown to be positively connected to the uptake of BI in SMEs. Compatibility is described as “the extent to which an innovation is judged to be compatible with the current values, previous experiences, and the requirements of prospective adopters” (Rogers, 1995). It has been proposed that technological breakthroughs disseminate more freely and readily when their applications seem to be compatible with the operations of the user. Nonetheless, other IS researchers could not uncover evidence of a favourable association between this feature and the uptake of IS in companies (Ramdani et al., 2009).

Complexity relates to how complex an invention is judged to be to comprehend and utilise (Rogers, 1995). According to the DOI hypothesis, the adoption of a new invention is impeded or discouraged if the user perceives it to be complicated. Although Hadaya (2006) and Huang et al. (2008) discovered that it was a significant predictor of BI acceptability in SMEs, Arif (2019) did not confirm that such a link existed in their research.

H_1: *The* relative advantage *has a positive impact on the adoption of business intelligence in SMEs.*
H_2: *The compatibility has a positive impact on the adoption of business intelligence in SMEs.*
H_3: *The* complexity *has a positive impact on the adoption of business intelligence in SMEs.*

2.3 Project Management Maturity

Project management is a complicated activity involving several variables and individuals, which can result in unforeseen difficulties and uncertainties. The word “project management”, as defined by Mirjana et al. (2017), refers to the process of planning and coordinating readily accessible resources in order to achieve set objectives. On the other hand, project management is very important in the planning and management of the execution of a project within the constraints of the resources available, time, and money (Abu-Hussein et al. 2016), while also serving the needs of the organization. Furthermore, a stated purpose, goal, and strategies are required to finish the project. A few interrelated objectives must be comfortable and attained in project management for a project to be deemed successful: human resources management, cost management, procurement management, risk management, success management, integration management, communications management, time management, scope management, and quality management (Larson & Gray, 2011). Organizational project management is also impacted by several elements. According to Al-Qirim (2007), critical success factors in enterprise resource planning initiatives include successfully implemented user support, business process change and engagement, and the knowledge of suppliers. Both Mirjana et al. (2017) and Ziek & Anderson (2015) believe that effectively managing organizational change is essential for the successful execution of an information technology project. Knowledge sharing helps a project team to decrease rework and reduce the time required for project planning (Hadaya, 2006). Providing the "correct information" to the "right person(s)" at the "right moment" enables better control over the project during its lifespan by minimizing uncertainty. As a result, we assume in our research that change management and knowledge exchange in organizations control project management. The following research hypotheses result from these associations:

H_4: *The Project management maturity has a positive impact on relative advantage of business intelligence adoption in SMEs.*

H_5: *The Project management maturity has a positive impact on compatibility of business intelligence adoption in SMEs.*

H_6: *The Project management maturity has a positive impact on complexity of business intelligence adoption in SMEs.*

H_7: *The Change management has a positive impact on Project management maturity of business intelligence adoption in SMEs.*

H_8: *The Knowledge sharing has a positive impact on Project management maturity of business intelligence adoption in SMEs.*

3. Method

3.1 Population and sample selection

For the purpose of testing the study hypotheses, a questionnaire-survey approach was employed. In December 2022, questionnaires were issued to companies with more than 40 workers. Companies that have adopted BIS to some degrees were specifically targeted through the use of purposeful sampling. The original list of 174 organizations was compiled by gathering company connections from different BI social media groups, including LinkedIn's "Big Data, Analytics, Business Intelligence, and Visualization Experts Community." The questionnaire has 41 items organized into three parts. The survey items were graded on a five-point scale ranging from strongly disagree to strongly agree, and online questionnaires were sent through Google Form. 112 questionnaires were recovered from the total number of online surveys sent. Two methods were used to validate the questionnaire (Fowler, 2001). Firstly, academic experts performed a revision of the questionnaire. Next, the updated questionnaire's results were assessed using a pretest. Hence, the study was able to ensure that the elements were logical and the terminology was correctly understood. Furthermore, participant input was included in the finished version.

3.2 Measurement instrument

The instrument for measurement was a self-reported questionnaire that was broken down into two primary sections and one section that concentrated on the elements that controlled the experiment. For the sake of controlling the variables, it was decided to use gender, age group, educational level, and experience as categorical measures on the elements that controlled the experiment. For the sake of controlling the variables, it was decided to use gender, age group, educational level, and experience as categorical measures. A five-point Likert scale (from 1 to 5 = strongly disagree) was used to assess the two

main elements. To evaluate the study's constructs, a self-assessed rating questionnaire was developed. Based on the literature study and interviews with a number of BI experts and practitioners, we established a set of measuring scales for project management and technological attributes. Relative advantage (RA), Complexity (COM), Compatibility (COMPA), BI adoption, Project Management Maturity (PMM), Knowledge Sharing (KS), and Change Management (CM). The constructs were chosen according to the theoretical model and research hypotheses offered. Relative advantage, BI adoption complexity, and compatibility of BIS constructs were created from the ground up, utilizing Rogers' original models (1995). The PMM model (Grant & Pennypacker, 2006) established by PM Solutions was used to assess the level of maturity in project management. Project procurement management was not included, however, since the enterprises studied for BIS adoption were privately held and not publicly traded. As building blocks, explanations of different aspects of project management were used. IT project managers, for instance, have power over project costs throughout the length of the project since the project budget is utilized to monitor project cost management. Knowledge sharing was conceptualized through the use of the methods of Al-Zayyat et al. (2014), while change management was conceptualized through the use of the techniques of Gu et al. (2014) and Markus (2010).

4. Findings

4.1 Measurement model evaluation

This study investigated research questions employing structural equation modelling (SEM), a contemporary statistical method for examining and quantifying the relationship between variables and factors. As a result, the reliability and validity of the factors were assessed using confirmatory factor analysis (CFA), utilizing the statistical software AMOS. Table 1 summarizes the results of convergent and discriminant validity as well as the reliability scores. As shown in Table 1, all elements' standard loading values were within the domains' permitted range (0.644–0.825), which exceeded the elements' minimal retention depending on their standard loads. An extracted average variance (AVE) greater than 0.50 indicates that the idea is convergent. Hair (2017) found that all constructs had AVE values greater than 0.50, indicating strong convergent validity of the measuring methodologies. Hair et al. (2010) introduced the covariance-based SEM comparison approach for discriminant validity assessment. The correlation between the remaining structures is compared to the maximum shared variance (MSV) and square root of AVE (AVE) values. MSV values were lower than AVE values, and AVE values were greater than correlation values across other elements. Thus, the employed assessment model demonstrates discriminative validity. The measuring model was evaluated using internal consistency (as determined by Cronbach's alpha) and compound reliability (as defined by McDonald's omega). As shown in Table 1, both Cronbach's alpha and McDonald's omega coefficients exceeded 0.70, the minimum threshold for measuring measurement reliability (Ramirez et al., 2013).

Table 1
Results of validity and reliability tests

Constructs	1	2	3	4	5	6
1. RA	**0.755**					
2. COM	0.745	0.676				
3. COMPA	0.718	0.698	0.739			
4. PMM	0.719	0.711	0.741	0.754		
5. KS	0.698	0.708	0.735	0.745	0.699	
6. CM	0.733	0.714	0.639	0.766	0.701	0.711
VIF	2.465	2.417	2.254	2.766	2.345	2.547
Loadings range	0.771- 0.786	0.790- 0.812	0.745- 0.825	0.644- 0.729	0.745- 0.825	0.820- 0.811
AVE	0.576	0.524	0.542	0.511	0.518	0.522
MSV	0.428	0.472	0.458	0.455	0.574	0.566
Internal consistency	0.867	0.822	0.825	0.847	0.865	0.814
Composite reliability	0.891	0.911	0.922	0.889	0.879	0.902

4.2 Structural model

Strong congruence with the conceptual model motivated us to study the model's structure (Fig. 2). Consequently, the research will examine if the hypothesised theoretical relationships are validated in a particular study circumstance. In the route analysis, we consider (i) the signs of the parameters, (ii) the statistical significance of the parameters (as defined by the t-value), and (iii) the variance of endogenous constructs (measured by the squared multiple correlation coefficient, – R^2). As demonstrated in Table 2, because the variance inflation factor (VIF) values were less than 5, there was no multicollinearity among the predictor components in the structural model. The model fit index values provided in Fig. 1 confirm this result, according to Hair et al. (2016).

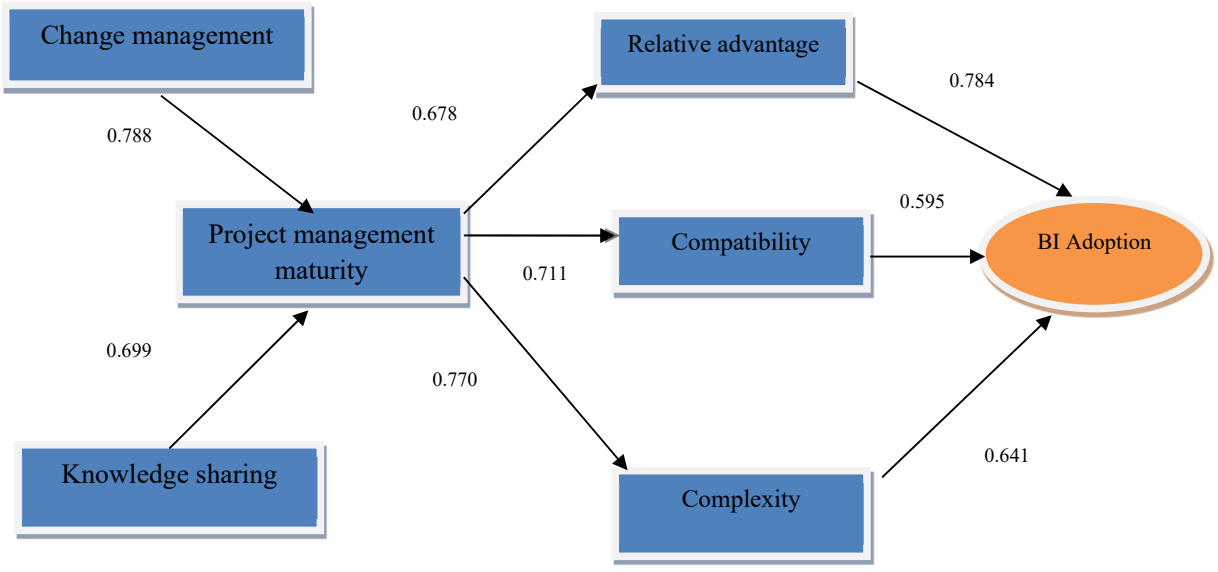

Fig. 1. Research Bootstrapping Results

As illustrated in Fig. 1, the ratio of chi-square to degrees of freedom (CMIN/DF) was 1.573, which is lower than the maximum value of 3, which represents the upper limit of this indicator. All three of the indices—the Tucker-Lewis index (TLI), the goodness of fit index (GFI), and the comparative fit index (CFI)—received scores that were higher than the minimum allowed value of 0.90. In addition, the root mean square error of approximation (RMSEA) was calculated to have a value of 0.022, which is considered a reasonable approximation error since it is lower than the 0.08 threshold that was set as the maximum limit. As a consequence of this, the information provided in Table 2 illustrates very clearly that the research model that is based on the assessment is enough to progress to the analysis of the study's hypotheses. The results of testing the study hypotheses were run through the structural equation model (SEM) for validation.

Table 2
Path Coefficient Test Results

Hypothesis	Relation	Standard Beta	*t* value	*p* value	Results
H1	CM → PMM	0.714***	28.40	0.000	Supported
H2	KS → PMM	0.668***	27.45	0.000	Supported
H3	PMM → RA	0.587***	25.39	0.000	Supported
H4	PMM → COM	0.712***	26.52	0.000	Supported
H5	PMM → COMPA	0.671***	23.54	0.000	Supported
H6	RA → BI	0.575***	21.99	0.000	Supported
H7	COM → BI	0.567***	28.63	0.000	Supported
H8	COMPA → BI	0.688***	27.91	0.000	Supported

The direct influence and linkages between the study variables have been thoroughly acknowledged, as have all the search hypotheses. In conclusion, the path model verified the hypothetical model's appropriate goodness of fit. The path model was analysed to validate the conceptual framework. All study hypotheses were confirmed, revealing the following associations: BI adoption is positively and significantly related to the relative advantage, compatibility, and complexity of BIS; project management maturity has a significant effect on the relative advantage, compatibility, and complexity of BIS; and project management maturity is significantly associated with the change management and knowledge sharing practises in industries.

5. Conclusions and implications

This study adds to the body of knowledge on BI by investigating the impact of determinants on BI use in developing countries. This all-encompassing model has guided several research projects in developed countries, and it has provided some fascinating new insights into how this may be different in a developing country environment like Jordan. Furthermore, an important feature of this research is the empirical investigation of this model, which uncovered some practical and thorough suggestions that may assist firms in such a scenario in planning business intelligence and analytics initiatives more effectively. The limitations of the study derive mostly from the attributes of the sample. Firstly, even though we believe that purposive selection was effective for identifying organizations that have previously embraced BIS, prospective readers should keep this in mind. Secondly, the study was done on a sample of Jordanian enterprises, and the findings of studies carried out in other countries may be affected by country-specific cultural factors since prior studies have shown that project management tends to vary

across country-specific cultures. Thirdly, since our study was of a cross-sectional nature, we were able to concentrate on the status of BIS acceptance within the specific time period but not on the dynamic aspects of technology adoption. Lastly, we believe that our study will serve as a platform for future investigations into how organizations, particularly those in developing nations, may employ business intelligence and analytics.

References

Abu-Hussein, R., Hyassat, M., Sweis, R., & Al-Debei, M. (2016). Project Management Factors affecting the Enterprise Resource Planning Projects' Performance in Jordan. *Journal of Systems and Information Technology, 18*(3), 230-254.

Acheampong, O. (2017). Business intelligence systems and bank performance in Ghana: the balance scorecard approach. *Cogent Business Management, 4*(1), 22.

Al-Okaily, A., Al-Okaily, M., Teoh, A., & Al-Debei, M. (2022). An Empirical Study on Data Warehouse Systems Effectiveness: The Case of Jordanian Banks in the Business Intelligence Era. *EuroMed Journal of Business*. https://doi.org/10.1108/EMJB-01-2022-0011

Al-Qirim, N. (2007). The adoption of ecommerce communications and applications technologies in small businesses in New Zealand. *Electronic Commerce Research and Applications, 6*(4),462-473.

Al-Zayyat, N., Al-Khaldi, I., Tadros, V., & Al-Edwan, G. (2010). The Effect of Knowledge Management Processes on Project Management. *IBIMA Business Review, 3*(1), 47-52.

Alzoubi, H. M., Elrehail, H., Hanaysha, J. R., Al-Gasaymeh, A., & Al-Adaileh, R. (2022). The role of supply chain integration and agile practices in improving lead time during the COVID-19 crisis. *International Journal of Service Science, Management, Engineering, and Technology (IJSSMET)*, *13*(1), 1-11.

Aruldoss, M., Travis, L., & Venkatesan, V. (2014). A survey on recent research in business intelligence. *Journal of Enterprise Information Management, 27*(6), 831-866, 2014.

Bahram, M., Arabzad, A., & Ghorbani, M. (2012). Innovation in market management by utilizing business intelligence: introducing proposed framework. *Procedia-Social and Behavioral Sciences, 41*, 160-167.

Damanpour, O. (1992). Organizational size and innovation. *Organization Studies, 13*(3), 375–402.

Fowler, J. F. (2001). Survey Research Methods (Applied Social Research). 3rd ed., Sage Publications.

Grant, K. P., & Pennypacker, J. S. (2006). Project management maturity: An assessment of project management capabilities among and between selected industries. *IEEE Transactions on engineering management, 53*(1), 59-68.

Gu, V., Hoffman, Q., Cao, Q., & Schniederja, J. (2014). The effects of organizational culture and environmental pressures on IT project performance: A moderation perspective. *International Journal of Project Management, 32*(7), 1170-1181.

Hadaya, P. (2006). Determinants of the future level of use of electronic marketplaces: The case of Canadian firms. *Electronic Commerce Research, 6*(2), 173-185.

Hair. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Thousand Oaks: Sage. https://doi.org/10.1016/j.lrp.2013.01.002.

Hou, H. (2012). Examining the effect of user satisfaction on system usage and individual performance with business intelligence systems: An empirical study of Taiwan's electronics industry. *International Journal of Information Management, 32(*1), 560–573. doi:www.elsevier.com/locate/ijinfomgt

Huang, Z., Janz, B., & Frolick, M. (2008). A comprehensive examination of Internet-EDI adoption. *Information Systems Management, 25*(3), 273–286.

Ifinedo, P. (2010). An Exploratory Study of Factors Influencing Internet/Ebusiness Technologies Adoption by SMES in Canada. *International Journal of Information Technology & Decision Making, 15*(6), 1-38. doi:https://www.researchgate.net/publication/220385210

Jain, V., & Kanungo, S. (2005). Beyond perceptions and usage: Impact of nature of information systems use on information system-enabled productivity. *International Journal of Human–Computer Interaction, 19*(1),113–136.

Jalil, A., Melan, M., Prapinit, P., & Mustaffa, A. (2019). Adoption of Business Intelligence - Technological, Individual and Supply Chain Efficiency. *International Conference on Machine Learning, Big Data and Business Intelligence IEEE*, 6, pp. 5-20. UUM. doi:10.1109/MLBDBI48998.2019.00021

Larson, W., & Gray, F. (2011). *Project management: The managerial process*. Ney York, USA, McGraw-Hill, 2011.

Mahmood, H., Khalid, S., Waheed, A., & Arif, M. (2019). Impact of macro specific factor and bank specific factor on bank liquidity using FMOLS approach. *Emerging Science Journal*, *3*(3), 168-178. https ://doi.org/10.28991 /esj-2019-01179.

Markus, M. (2004). Techno-change management: using IT to drive organizational change. *Journal of Information technology, 19*(1), 4-20.

Mikroyannidis, A., & Theodoulidis, B. (2010). Ontology management and evolution for business intelligence. *International Journal of Information Management, 30*(6), 559–566.

Mirjana, P. B., Jovana, Z., & Amer, C. (2017). An extension of the technology acceptance model for business intelligence systems: project management maturity perspective. *International Journal of Information Systems and Project Management, 5*(1), 5-21. doi:www.sciencesphere.org/ijispm

Mohammad, A. B., Al-Okaily, M., & Al-Majali, M. (2022). Business Intelligence and Analytics (BIA) Usage in the Banking Industry Sector: An Application of the TOE Framework. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(4), 189.

Nithya, A., & Kiruthika, A. (2022). Impact of Business Intelligence Adoption on performance of banks: a conceptual framework. *Journal of Ambient Intelligence and Humanized Computing, 9*(2), 1-12. doi:https://doi.org/10.1007/s12652-020-02473-2

Pejić-Bach, M., Zoroja, J., & Čeljo, A. (2016). Technology Acceptance Model for Business Intelligence Systems: Preliminary Research. *Procedia Computer Science, 100*, 995-1001.

Popovič, A., Hackney, R., Coelho, P., & Jaklič, J. (2012). Towards business intelligence systems success: Effects of maturity and culture on analytical decision making. *Decision Support Systems, 54*(1), 729-739, 2012.

Ramdani, B., Kawalek, P., & Lorenzo, O. (2009). Predicting SMEs' adoption of enterprise systems. *Journal of Enterprise Information Management, 22*(1/2), 10-24.

Ramirez, E., David, M. E., & Brusco, M. J. (2013). Marketing's SEM based nomological network: Constructs and research streams in 1987–1997 and in 1998–2008. *Journal of Business Research*, *66*(9), 1255-1260.

Rogers, E. M. (1995). *Diffusion of innovations*. New York: The Free Press. . Original publication 196.

Tornatzky, L. G., & Klein, K. J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on engineering management*, (1), 28-45.

Ziek, P., & Anderson, D. (2015). Communication, Dialogue and Project Management. *International Journal of Managing Projects in Business, 8*(4), 788-803.