A Readiness Assessment Model for ERP Implementation

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Abstract: *Today, Enterprise Resource Planning (ERP) system has become a necessity for an organization to improve its performance. Even so, ERP has yet to be optimally implemented. This causes the cost of ERP implementation to be high. The most of ERP implementation methods are still using traditional methods. It is necessary to consider other implementation methods which can reduce failure. An agile method is one of the alternative solutions applying the readiness assessment in implementing an ERP. The readiness assessment in implementing ERP is important to reduce the failure rate in ERP implementation. The purpose of this research is completed and focus the readiness factors perspective in carrying out the change process by agile models. This research's idea is to analyze with different perspective about the readiness assessment to make changes with an agile model for ERP implementation to enhance business agility. The methodology research is used qualitative research Focus Group Discussion with data analysis of the NVivo software. The result of this research is to propose a readiness assessment model for ERP implementation.*

Keywords: Nvivo, Readiness assessment, Agile method, ERP implementation

I. INTRODUCTION

Currently, considering a dynamic business environment, digitization transformation, and the growth of innovative technologies, thus the business activities are carried out relatively quickly, accurately, and in real-time without having to set time, place, and a face-to-face meeting. Without making changes that follow the trend of business changes will become ineffective and inefficient so that there will be a tendency for organizations to go collapse. This is the reason for organizations to increase productivity and performance with technological support. The implementation of ERP systems is one of the technological innovations that overcome the inefficiency in the industry and is crucial for organizations to change to dynamic and efficient ways of working through technological support. For this reason, the use of an ERP system must be a necessity for every organization to provide information for managers to make strategic decisions and maintain business competition. Although ERP implementation has been carried out for several years, the reality is that there is a tendency to experience a late ERP implementation, even the risk rate of experiencing ERP implementation failure reaches 40% [23]. One of the critical factors which cause failure in ERP implementation is the effectiveness of project management and change management methods [18]. Thus, improving the quality of ERP implementation is needed with the change management processes to standardize and redesign business processes running on ERP system. For this reason, it is to consider readiness factors assessment in ERP implementation using agile method. The characteristics of an agile method are effective feedback in every literacy, focusing on system integration and business needs, on time, collaborating and communication intensively, not compromising on quality, and controlling [24]. The development of an agile method in ERP implementation can follow changes to meet business needs. This research aims to find gaps the failure rate in ERP implementation by focusing on the development of an agile model for ERP readiness assessment. The research questions which will be answered in this research are as follows:

a. Is the agile model suitable for ERP implementation?
b. How to readiness assessment model developed practically for implementing ERP?

II. LITERATURE REVIEW

A. ERP implementation

The identification of Critical Success Factors (CSFs) has enhanced ERP implementation success [5]. The CSFs are categorized in dimensions such as organizational, people, process, technical, and project which the dimensions have strong collaboration and interaction with each other to improve organizational performance.

B. Agile model

The principles of the agile model are responding to changes over following a plan which the agile model can be considered as an alternative solution to handle complexity in ERP implementation [23]. In addition, the advantages of the agile model are incremental, iterative, collaborative, and communicative well for responding to changes [17].

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The previous research has considered a comparison between the traditional model and agile model in ERP implementation. The result of the comparison between the traditional model and agile model in ERP implementation is shown in the fig 1
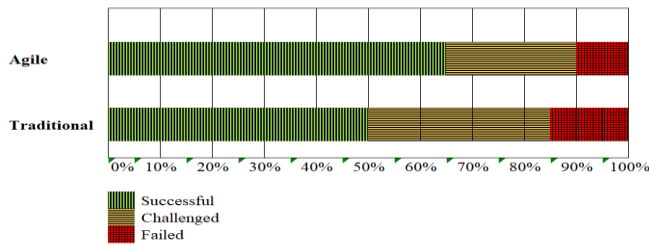

Fig 1. Comparison of model in implementing ERP [23]

Based on the comparison between the traditional model and the agile model in ERP implementation, it is clear that the agile model can be one effective solution to reduce the failure rates in implementing ERP within the organizations. With agile model, the failure rate is smaller, and this means to increase of success in implementing ERP [22]. The advantages and disadvantages of agile model are depicted in the table 1. In this research, the authors try to development a readiness assessment model for ERP implementation.

Table I. Comparison of advantage and disadvantages of agile model [22]

AGILE MODEL ADVANTAGES	AGILE MODEL DISADVANTAGES
- Customer satisfaction by rapid, continuous delivery of useful software. - People are emphasized rather than process and tools - Customers, developers and testers constantly interact with each other. - Working software is delivered frequently. - Face-to-face communication. - Daily cooperation between business people and developers. - Continuous attention to technical excellence & good design - Regular adaptation to changing circumstances. - Even late changes in requirements are welcomed	- It is difficult to assess the effort required at the beginning of the software development life cycle. - There is lack of emphasis on necessary designing. - The project can easily get taken off track if the customer representative is not clear what final outcome - Only senior programmers are capable of taking the kind of decisions required during the development process. - Hence it has no place for newbie programmers, unless combined with experienced resources.

C. ERP readiness assessment

The implementation of ERP projects is a large-scale project that cannot be separated from complexity and uncertainty. Therefore, the agile model in ERP implementation is likely to provide an advantage focusing more on incremental and iteration of each stage of implementation. The agile model can make work more comfortable and efficient. As stated before, the advantage of an agile model is in iterative and collaborative. If the ERP implementation opens up space for changes to existing systems, then the iteration and collaboration factors will be valuable. The reason is that those factors provide many opportunities for the business to understand and convey what they need, while the technical parties can understand and realize what is needed by the businesspeople. Such work methods which can improve product quality with synchronization of business requirement and ERP implementation will be successful. The Critical Factors of agile development project have five dimensions such as organizational, people, process, technical, project [6]. The agile model in ERP implementation with considering the factors which include conduct an agile assessment, train team, plan the project, and implement. Each factor have a strong iteration and collaboration activities in order to improve

synergy, innovation and support the business needs [6]. Therefore, the organization need to measure the level of readiness organization in implementing ERP. Before making the assessment, then we should know the weight of each readiness factors for ERP implementation. There are 37 readiness factors for ERP implementation and into 4 dimensional categories such as technoware, humanware, inforware, and orgaware [25]. The weights of readiness factors for ERP implementation is shown in the table II.

Table II. Weights of readiness factors [25]

Indicators	No	Readiness Factos	Weight
Technoware	1	Communication network hardware	0.047
	2	IT legacy systems	0.027
	3	Enterprise wide systems	0.021
	4	IT maturity	0.038
	5	Production facilities	0.011
Humanware	6	Enterprise wide thinking	0.050
	7	Flexible workforce	0.046
	8	Project champion	0.051
	9	Skilled staff	0.048
	10	Top management commitment	0.053
	11	Lifelong learning	0.018
	12	Level of competence	0.007
Inforware	13	Information sharing	0.034
	14	Information standarization	0.031
	15	Data integrity	0.040
	16	Level of utility of recorded facts	0.023
Orgaware	17	Process orientation	0.017
	18	Replacing organization silos with process teams	0.010
	19	Best practices	0.006
	20	Business Process Reengineering experience	0.024
	21	Value added costing	0.004
	22	Process capability performance of six sigma	0.003
	23	Continuous and rapid operational improvement	0.014
	24	Resolving process constraints	0.020
	25	Customer focused performance measurement	0.030
	26	Team and individual appraisal	0.013
	27	Supply Chain Management	0.041
	28	Business plan and vision	0.028
	29	Business size	0.037
	30	Team based organization	0.016
	31	Customer focused organization	0.033
	32	Operate in paper less environment	0.026
	33	Learning organization	0.036
	34	Shared vision, values and goals	0.043
	35	Integrated resource management	0.044
	36	Flatened organizational hierarchy	0.009
	37	Benchmark performance	0.001
		Jumlah	1.000

The weights of each readiness factors will be the basis for the assessment in the discussion of this study. The weights of each readiness factors will be determined based on a readiness level assessment scheme such as primary level = 25; secondary level 50; tertiary level = 75; advanced level = 100 [25]. To understand comprehensively about the readiness factors in implementing ERP, the authors mapped based on the survey literature according to the references used. The mapping results are 18 indicators to consider as the readiness factors. Then from these 18 indicators, the authors categorized them into 4 dimensional categories such as people, process, organization, and technology. These 18 indicators will become the basis of list questions for the Focus Group Discussion (FGD) to get feedback from the respondents. The mapping result depicted in the table III.

Table III. Mapping dimensions and indicators based on survey literature

No	Indicators	Total	References	People	Process	Organization	Technology
1	Development industry	2	[3, 10]			✓	
2	Culture and structure organization	3	[7, 12, 15]			✓	
3	Integrated information systems	3	[12, 13, 18]				✓
4	Change management readiness	4	[2, 7, 12, 14]			✓	
5	Incremental and iterative	4	[1, 8, 11, 18]				✓
6	Communication and collaboration	4	[3, 7, 8, 14]			✓	
7	Critical success factors	5	[5, 12, 14, 15, 17]		✓		
8	Planning strategy	5	[6, 9, 13, 14, 16]			✓	
9	Process business change	5	[1, 8, 11, 12, 19]		✓		
10	Management support	5	[3, 4, 7, 12, 19]			✓	
11	Project team	5	[3, 4, 7, 8, 11]	✓			
12	Implementation methodology	6	[6, 8, 9, 10, 12, 13]				✓
13	Train and education	6	[6, 8, 9, 12, 18, 19]	✓			
14	Project management	7	[2, 7, 10, 14, 15, 16, 17]			✓	
15	ERP system	8	[6, 7, 8, 10, 12, 16, 18, 19]				✓
16	Agile model	10	[2, 3, 4, 5, 6, 8, 11, 12, 15, 18]				✓
17	Organization readiness	10	[1, 2, 7, 10, 11, 12, 13, 14, 15, 16]			✓	
18	ERP implementation	11	[3, 6, 7, 8, 9, 10, 12, 15, 16, 18, 19]				✓

III. METHODOLOGY

A. Research method

In this research, the authors conducted a qualitative research using FGD method with interview to the domain experts in the textile industry in Indonesia as a case study. The authors conducted interviews with experts using the FGD method to get input, information, and feedback, comments regarding, and sharing experience from the respondents. Besides that, FGD method is the collection of qualitative data by conducting group interviews with experts in the Information Technology field. Indeed, the purpose of FGD method is to get a more comprehensive understanding and to get information views and feedback from experts based on their experience and knowledge which provide answers to the research questions of this research. This research uses NVivo software qualitative data analysis approach as the methodology. NVivo software is great for managing data and helps understand the data analysis process. This research is what distinguishes it from previous research.

B. Data respondent

In this research, the authors selected the interview respondents who are the experts of the domain that have plenty of expertise and experiences especially in the field of Information Technology or Information System. Besides that, we also pay attention to the work experience, educational background, industry type, and the age of the respondents. Thus, that the feedback and comments given from them become meaningful in the data management process. Therefore, the authors can answer the research questions in this study. The respondent's characteristics are shown in the table IV.

Table IV. Respondents characteristics

Respondent profiles	Frequency	%
Gender		
Male	11	85%
Female	2	15%
Age		
20-30	5	38%
31-40	3	23%
41-50	4	31%
>51	1	8%
Educational Level		
strata-1	7	54%
strata-2	6	46%
Tenure		
2-3 years	0	0%
4-5 years	0	0%
>5 years	13	100%
Background of education		
IT / IS	13	100%
Finance/Management	0	0%
Role of respondents		
Manager/General Manager	10	77%
Director	3	23%
Industry type		
Manufacturing-Textile	10	77%
IT Consultant	3	23%

C. Process of data gathering and analyzing.

The step for using Nvivo software for data analysis are starting a project, working with qualitative data files, working with nodes, coding qualitative data, going further [24]. Based on the identification of problems, the authors conducted a survey of previous research using literature studies in order to find a comparison of the identified problems. After that, the authors identified the critical factors and classified them in dimensions or indicators and providing an explanation of these dimensions as a basic material for list of questions for interviews with domain experts in the form of FGD. Before

conducting the FGD interview, the authors prepared a list of the companies in the category of public companies and several IT consultants as a comparison. The authors have communicated with the domain experts who will become respondents related to willingness to conduct interviews in the form of FGD. After that, the authors distributed the invitation letter to the respondents and prepared the schedule for the FGD interview with the agreed time and place to conduct the FGD. But the respondents who attended consisted of 10 managerial levels from the textile industry in Indonesia, 3 managerial levels of IT consultants, and 4 managerial levels from the industry. In the FGD interview, the authors recorded the FGD interview activity. The recording results of the FGD interview, was transcribed in the Microsoft word format. Then the authors managed the data using NVivo10 software. To get objective results related to research topics in the textile industry in Indonesia, the authors only processed 13 respondents' data (10 textile industries and 3 IT consultants) using NVivo10 software. Based on the results of managing the data, the authors conducted a comparison with the literature study and summarized the analysis of the results of the FGD data management. After that, the authors proposed a research model followed up by conducting questionnaires from the respondents to get quantitative opinions. At the initial stage, we create a new project and a password, and save the file. Then we do the data management process by importing data files and browsing data that has been carried out by transcripts of interview results based on the interviews that have been conducted through the previous FGD method. After that, we determine the attributes of the type nodes and create nodes based on the categories of questions we have summarized before. Then we code qualitative data by mapping each answer from each respondent according to the question category. This is the screen display of NVivo software which can be seen in figure 2.
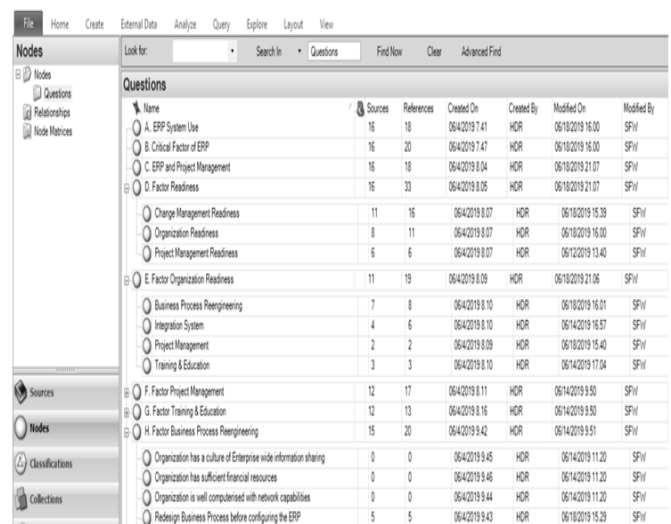

Fig 2. Display of NVivo software

Based on figure 2, authors analyzed data, concepts, categories, and data matrix mapping towards the proposed NVivo software model.

IV. RESULT AND DISCUSSION

Based on the results of the FGD transcript of the respondents and the results of the mapping of analyzed data, concepts, categories, and data matrix from NVivo software, then the authors have examined the answer by mapping the data analysis to the research questions of this research.

A. The agile model suitable for ERP implementation.

Based on the results of the FGD interviews from domain experts, the authors conducted transcripts and managed the data analysis by NVivo software. The authors give a ranking of the factors that refer by respondents. The results of data management from NVivo software, it could be said that the three main factors which become the dominant factors that influence the readiness factors in implementing ERP is namely: agile model. The result is indicated that agile model suitable for ERP implementation. The result managing data analysis by NVivo software is shown in the table V.

Table V. The result indicators of managing data analysis

No	Indicators	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	People	Process	Organization	Tehnology	Linguistic scale	Weight readiness	Value of readiness
1	ERP project	2								1		1							✓	25	0.021	0.525
2	Organization readiness	6		2						2					2			✓		25	0.028	0.700
3	Development	6			1	1		3		1								✓		25	0.010	0.250
4	Strategic planning	8	1			1	1				4		1					✓		25	0.028	0.700
5	ERP systems	8				1	1	4		2									✓	25	0.021	0.525
6	Change management	10	1			1			2	1	5							✓		25	0.028	0.700
7	Technologies	10			1			3	2		1	2	1						✓	25	0.047	1.175
8	System integrated	10	1				1			5			3						✓	25	0.027	0.675
9	Agile metode	14	2			1	2			3	2		2	2					✓	50	0.030	1.500
10	Industry	14		1	1		3	3	2		3	1							✓	50	0.037	1.850
11	Training	15	1	2	1	2		1		2	3		1			✓				50	0.036	1.800
12	**Project management**	16				1	4	1	4	3	3								✓	50	0.050	**2.500**
13	ERP implementation	20			1	1			8	1	5	1	3						✓	50	0.021	1.050
14	Process business	22	1	2	1	3	1		2	7	2	2	1				✓			50	0.003	0.150
15	Organization readiness	40	1		5	3	2	3		9	2	10	4	1				✓		75	0.006	0.450
16	**Project team**	41		1		2	1	8	10		10	1	8			✓				75	0.048	**3.600**
17	Business process change	66	5	1	6	1		1	13	12	17	6	4				✓			75	0.024	1.800
18	**Management support**	73		2	1	1	2	5	1	14	12	16	9	10	0			✓		75	0.053	**3.975**
19	**Agile model**	78	4		1	1	5	2	17	4	29	8	3	4					✓	75	0.030	**2.250**

The readiness factors in implementing ERP. Based on the transcripts of FGD interviews and according to the results of the interview, authors mapped the following indicators of managing data analysis by NVivo software. Based on the table V, agile model, management and business process change are the top ranking that are considered for readiness factors assessment of ERP implementation. Referring to the answers of the respondents above, therefore it will map the answers of the respondents in the dimension matrix and factors. Here are the answers of FGD questions from the respondents which are handled by mapping to each dimensions factors. Then, the authors categorized the indicators into four dimensional categories such as people, process, organization, and technology. After that based on business actvity from each indicator, so the authors categorized each indicators into 4 demensional categories such as people, process, organization, and technology. Then, the authors determine weight of linguistic scale based on ranking of respondent for each indicator. And based on the weights of readiness factors on table 2, so the authors write weights for each indicator and the calculated value of readiness which is the result of multiplication of the linguistic scale with the weight of readiness. The value result of readiness indicate that 4 top ranking of readiness factors for ERP implementation are management support, project team, project management, and agile model. These readiness factors become the critical factors and more focus for considering that will achieve the successful in implementing ERP for industry.

B. Readiness assessment model developed practically for implementing ERP.

Before an organization decides to implement ERP, it is necessary to assess the readiness factors. This assessment takes the integration factors into account, such as business processes of selected ERP systems, the people and project teams involved, the technology used, and the organizational structure. It is including the factors of people, process, organization, and technology that collaborate with each other and integrates the activities of practical agile method of interaction, which optimize an incremental and iterative functions at each stage of the project, so as to conduct an agile assessment, train team, plan project, and implement. The results of the assessment of these four aspects will enhance the business agility. It is proved by level of satisfaction of the users and management, dynamic organizational structures in adopting change management, achieving targeted business objectives appropriately, and reducing inequalities. Based on the description above, so the authors propose a readiness assessment model for ERP implementation that can be shown in the figure 4.
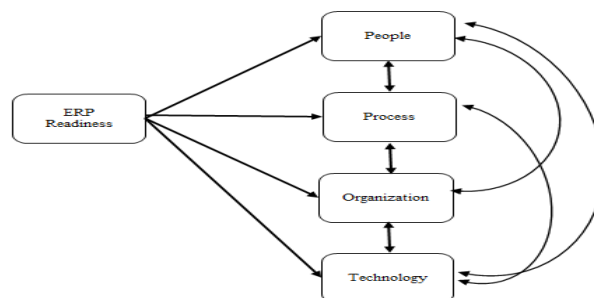

Fig 4. Readiness assessment model for ERP implementation

Before the organization decides for ERP implementation, It is necessary to conduct an readiness factors assessment that into the dimensions such as people, process, organization, and technology. These dimensions will collaborate with each other. The readiness assessment with agile model will enhance the successful in implementing ERP for industries.

V. CONCLUSION

This research has shown that the agile approach is highly helpful in simplifying business processes and readiness assessing of ERP implementation. The readiness assessment is crucial in carrying out project management, therefore organizations must have effective and efficient business strategies and tactics for responding to change by using the agile method for supporting activities of the organizations, because the agile principle has a level of adjustment, and rapid adaptation.

Based on the results of this research, the readiness factors that improve organizational performance before making ERP implementation decisions, it is necessary to assess the critical readiness factors are people, process, organization, and technology. Therefore, we propose a readiness assessment model for ERP implementation as one of the solutions to reduce the failure rate of ERP implementation. The iteration and collaboration in a model is not limited to only making and testing. Instead, an iteration and collaboration in a model also include defining where there is defined for fundamental responds to change. However, the changes are not automatically carried out, but it requires a commitment from the project management to determine priorities and make decisions to realize the impact of change in order to improve organizational performance.The authors realized that this research has limitations. Therefore, to translate the framework of a practical readiness assessment model in a case study, then the author will further the quantitative research to measure the agility model by determining the criteria and using the Structural Equation Modeling. For this reason, further research is needed by development of a readiness assessment model with build a prototype the application for validating that can be made as a benchmark for carrying out real evidence on the industry by applied to a real case by a test result model in the industries.

REFERENCES

1. Alleman, GB (2002). Agile project management methods for ERP: how to apply agile processes to complex COTS projects and live to tell about it. In Conference on Extreme Programming and Agile Methods. Springer, Berlin, Heidelberg.
2. Azar, J, Kelley, K, Dunscomb, J, Perkins, A, Wang, Y., Beeler, C. & Kara, A. (2018). Using the agile implementation model to reduce central line–associated bloodstream infections. American journal of infection control.
3. Ambler, S. W. (2003). Agile model driven development is good enough. IEEE Software, 20(5), 71-73.
4. Baig, JJA, Shah, A, & Sajjad, F. (2017). Evaluation of agile methods for quality assurance and quality control in ERP implementation. In Intelligent Computing and Information Systems (ICICIS), 2017 Eighth International Conference on (pp. 252-257). IEEE.
5. Campanelli & Parreiras (2015). Agile methods tailoring–A systematic literature review. Journal of Systems and Software, 110, 85-100.
6. Chow, T., & Cao, DB. (2008). A survey study of critical success factors in agile software projects. Journal of systems and software, 81(6), 961-971.
7. Fetouh AA, el Abbassy A, & Moawad R. (2011). Applying Agile Approach in ERP Implementation. IJCSNS, 11(8).
8. Gunasekaran, A. (1999). Agile manufacturing: a framework for research and development. International journal of production economics, 62(1-2), 87-105.
9. Hidayanto, A. N., Hasibuan, M. A., Handayani, P. W., & Sucahyo, Y. G. (2013). Framework for Measuring ERP Implementation Readiness in Small and Medium Enterprise (SME): A Case Study in Software Developer Company. JCP, 8(7), 1777-1782.
10. Kraljic, A., & Kraljic, T. (2017) Agile Software Engineering Practices and ERP: Is a sprint too fast for ERP Implementation?
11. Kraljic, A., Kraljic, T., Poels, G., & Devos, J. (2014). ERP implementation methodologies and frameworks: a literature review. In 8th European Conference on IS Management and Evaluation (ECIME) (pp. 309-316). Academic Conferences and Publishing International Limited.
12. Liao, L. M., Huang, C. J., & Lin, X. Y. (2018). Applying Project Management Perspective for ERP Implementation: A Case Study. Proceedings of Engineering and Technology Innovation, 8, 40-45.
13. Lee, G., & Xia, W. (2010). Toward agile: an integrated analysis of quantitative and qualitative field data on software development agility. Mis Quarterly, 34(1), 87-114.
14. Mariouli, M., & Laassiri, J. (2019). Applying Agile Procedure Model to Improve ERP Systems Implementation Strategy. In International Conference Europe Middle East & North Africa Information Systems and Technologies to Support Learning (pp. 471-481). Springer, Cham.
15. Nerur S., Mahapatra R., Mangalaraj G. (2005). Challenges of migrating to agile methodologies. Communications of the ACM, 48(5), 72-78.
16. Nofal, M. I. M., & Yusof, Z. M. (2016). Conceptual model of enterprise resource planning and business intelligence systems usage. International Journal of Business Information Systems, 21(2), 178-194.
17. Ram, J., Corkindale, D., & Wu, M. L. (2015). Examining the role of organizational readiness in ERP project delivery. Journal of Computer Information Systems, 55(2), 29-39.
18. Razmi, J., Ghodsi, R., & Sangari, M. S. (2008). A fuzzy ANP model to assess the state of organizational readiness for ERP implementation. In 2008 4th International Conference on Information and Automation for Sustainability.
19. Shahin, A., & Jamshidian, M. (2006). Critical success factors in project management: A comprehensive review. In Proceedings of 1st International Project Management Conference (pp. 1-14).
20. Hilal, AH & Alabri, SS. (2013). Using NVivo for data analysis in qualitative research
21. Peci M & Vazan P. (2014). The biggest critical failure factors in ERP implementation. In Applied Mechanics and Materials (Vol. 519, pp. 1478-1482).
22. Nunnally, JC, (1978). Psychometric theory. New York: McCraw-Hill
23. Zhang, Z., Lee, MK., Huang, P., Zhang, L., & Huang, X. (2005). A framework of ERP systems implementation success in China: An empirical study. International Journal of Production Economics, 98(1), 56-80.
24. Zhang, Y., & Patel, S. (2011). Agile model-driven development in practice. IEEE software, 28(2), 84-91.
25. De Soysa, S & Nanayakkara, J. (2006). Readiness for ERP implementation in an organization: Development of an assessment model. International Conference on Information and Automation (pp. 27-32). IEEE.

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