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Analysis of Critical Success Factors on ERP Implementation in PT. Toyota Astra Motor Using Extended Information System Success Model

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***Abstract*— PT. Toyota Astra Motor (TAM) as one of the big companies in Indonesia that have implemented an ERP (Enterprise Resource Planning) since 2000, then ECC 6.0 version of SAP (Standard Application Product in Data Processing) information system at 2003. This makes Critical Success Factors (CSFs) become something interesting to identify for the purpose of benchmarking as the best practice. This study was conducted to examine the ERP system implementation in PT. Toyota Astra Motor, which is based on 11 variables identified by adjusting the extended IS Success Model based on the previous research of Abdesamad Zouine and Pierre Fenies [3]. Therefore, data collection was conducted by distributing questionnaires to users of ERP systems in the respected company through delegating the process to the person in charge. Then the data was analyzed by inferential statistics to identify the significance of each variable, which has the results in term of individual impact, project management and information quality. It has verified that the success of the ERP system implementation at PT. Toyota Astra Motor is influenced by individual contributions, the level of acceptance of the ERP system, the contribution of key user, management of good implementation projects and the quality of information during the implementation phase.**

Keywords— ***Enterprise Resource Planning (ERP), Critical Success Factors (CSFs), Implementation, Extended IS Success Model***

I. INTRODUCTION

In the last few decades, the largest business companies have been equipped with ERP systems to support their business activities. It can be defined as a solution concept, automation technique, or integration method used to connect all functions of a company into a distributed system for the entire business process in order to improve the effectiveness and efficiency of the performance with accurate and measurable achievement [1]. Therefore, it requires a large sum of investment, which in actual practice certain company can face with complex problems within the implementation phase, even at the evaluation process. Increasing the user satisfaction to truly adopting an ERP system is not an easy task but quite difficult and extremely important as a determinant of success in any company or organization [2]. Surely, the readiness is one of the primary factor that leads to the successful implementation by highlighting two sub domain namely organizational commitment and the perception of personal competence [3] with various studies also have been backed such claims [1-5].

PT. Toyota Astra Motor is one of large business as well as multinational company to be implemented an ERP system in Indonesia to coordinate their internal and external process as a manifestation of the information system strategies in every functional unit. It is necessary to analyze CSFs to identify key elements and aspects that determine the success of the ERP system implementation in the company as benchmark analysis. New research on the success of ERP applications reveals mixed results although respondents were satisfied with their program choices, the survey showed that most ERP projects exceeded the budget and buyers did not fully receive the expected benefits with some participants described their ERP projects as failures [27-31]. It showed that 287 respondents out of 300 have mentioned that updating technology become primary problem that expectation cannot be achieved in the actual benefits, while growth and competition, reporting and visibility as well as efficiency becomes the other obstacles respectively [27]. Other survey at 2017 [28] stated that 80% customers are unhappy with their current ERP with 60% of ERP projects fail miserably with 95% of failure companies dedicate less than 10% of total budget to training program and change management. Meanwhile, 57% of ERP systems take longer than expected and 54% exceed projected budget targets with 90% fail to deliver any measurable ROI. In this study, exploratory factor analysis was used based on previous research in 2014 [3] entitled "*The Critical Success Factors of ERP Project Systems: A Meta-Analysis Methodology*" to evaluate the suitability of the information system usage strategies with the company's business strategy in understanding the reason why the adoption of ERP have tendency to be failed.

II. LITERATURE REVIEW

Critical Success Factors (CSFs) are terms that represent various critical or important factors including activities or activities that need to be carried out to ensure the success achieved by a company or organization [4]. The main objective of CSFs is to make objective interpretations clearly

in order to determine the activities that must be carried out and information needed when implementing a system or product [5]. CSFs are commonly found in fields such as production processes, staffing and organizational skills, functions, techniques and information technology [6]. Analysis of CSFs can be carried out on all aspects and fields that are considered influential on the business continuity of a company. In implementing ERP, the entire company transaction is made to be interconnected and integrated such as in the sales process, equipment management, production and distribution planning, and finance. ERP is a multifunctional system and can be driven by integrated application modules that help the company's internal business processes [7]. In practice, the success of an ERP system is achieved when the organization is able to carry out all its business processes properly and the ERP system achieves the desired goals [8]. ERP system implementation projects require high financial commitment and offer many potential benefits for the organization if successfully implemented, understanding the factors that lead to successful ERP implementation is needed [9]. The CSF method is a very interesting method for researchers and top management because it facilitates the identification and prioritization of important factors that might affect the success of an ERP system implementation. In the implementation of an ERP system, CSF can be identified as a number of key areas where everything must be done correctly so that implementation can be successful [10].

In 1992, DeLone and McLean synthesized various studies in their paper entitled "*Information System Success: Searching for the dependent variable*." They modeled for evaluating the success of information systems at the organizational level [11]. Thus, they relied on the mathematical theory of communication that made by Weaver and Shannon in 1949 to assist them in developing a model for the successful implementation of information systems in the organizational sector. Based on the mathematical theory of communication, the success of organizational information systems is measured at three levels, namely, technical level, semantic level, and effectiveness [12]. The technical level defines the efficiency and accuracy of the system to produce information. Meanwhile, the semantic level defines the success achieved when delivering information to the intended party. On the other hand, the effectiveness of the system defines the impact that information produces on a user. Based on the project documents, there are primary reasons on the adoption of ERP system for financial systems, which are obsolete legacy systems, integration issues, compliance with international public sector accounting and lack of financial information to management and stakeholders [30]. Some of criteria that lead to ERP projects fail such as lower returns than expected, inability of the ERP system to meet predetermined functional requirement, crossing budget limitations, higher maintenance and training costs, missing development and deployment dates, incorrect working of the system and not living up to estimated expectations [31].

Organizational change management is an important aspect of ERP implementation by communicating with employees before changes occur, reducing resistance to change. Therefore, this is nothing more than a communication plan but a framework for successful transition and training of workers. When organizations follow digital transformation initiatives, they find that the integration of people, processes and technology is a challenge [27]. As a result, the principles of change management are broader among organizations. On the other hand, some of these organizations use traditional change management programs while others adapt traditional methods to suit the current digital age [27, 29]. At the same time when customer requirements are met with the latest systems and operating systems, the processes carried out in the work will be increased independently and quantitatively [31]. ERP applications require the services of many professionals or consultants, which require a large amount of money for this service. The main costs in this category are adjustment, integration, data conversion, data migration, testing and training. CFOs are unlikely to support unlimited funding ideas for ERP projects with a lot of cost information from vendors. However, sellers tend to give certain numbers for each item, which may be an estimate. This may be the case for elements such as consultation, which historically represent an area of potential overcapacity [29]. The best practices of change management are those capable of digitizing the workforce. It combines traditional change management activities with a modern approach that focuses on leading successful business outcomes. For example, organizations should develop a digital conversion charter that outlines the strategies, objectives and tactics needed. They also have to develop realistic and measurable KPI to manage change successfully [27]. The main reasons for the elements related to this dissatisfaction of user in implementing ERP system include weak work situations, faulty requirements, poor strategic or tactical planning, erroneous budgets, weak training programs and general difficulties with the ERP platform [28]. Therefore, a short training system ensures that the minimum and total disasters are the worst.

III. RESEARCH METHODOLOGY

This type of research is quantitative research with the stage of collecting data through the preparation of questionnaires, testing indicators using a pilot study procedure for 28 respondents, distributing questionnaires to users of ERP systems at PT. Toyota Astra Motor which numbered 85 respondents. The sampling technique with non-probability sampling used was purposive sampling because the main purpose of that sampling technique was to concentrate on people with certain characteristics who would be more helpful for more relevant research while the sample size was determined using the Slovin technique. Furthermore, the collected data is processed using IBM SPSS Statistics 23 and SmartPLS v3 software to be tested by the measurement model test and structural model test. This test is conducted to analyze the structured path coefficients, determine the level of significance, and test the research hypothesis. The variables used in the research model are obtained through a combination of several theories, namely mathematical theory of communication, about three levels that must be taken into account to evaluate the success of information system implementation (technical level, semantic level and level of effectiveness), diffusion innovation theory, about classification of the three main factors in the conceptual model namely, organizational technology, and environment, and adaptive structural theory, about the interaction between variables (factors) and performance at three levels: individuals, workgroups, and organizational performance [3].

IV. HYPOTHESIS DEVELOPMENT

A. Individual Impact

In an ERP system, this factor influences ERP project integration. User involvement, quality of service that can help user activity, level of user understanding [13], user performance, level of work efficiency, benefits of individual workability [14], and user productivity level are individual factors in the success of an ERP system [15].

Hypothesis 1: Individual impact has a positive and significant influence on the success of ERP system implementation.

B. Information Quality

Some researchers propose many criteria for measuring information quality such, ease of access [15], information updating, completeness, the relevance of information, and accuracy of information [14].

Hypothesis 2: Information quality has a positive and significant influence on the success of ERP system implementation.

C. Workgroup Impact

Workgroup impact is a fairly important factor between individual impact and organizational impact, many organizations place greater emphasis on the role of a team in the workplace [16] [17]. The criteria for measuring the impact of workgroups on the success of ERP system implementation include work team communication, work team productivity levels, responsibility awareness, and work participation rates [14].

Hypothesis 3: Workgroup impact has a positive and significant influence on the success of ERP system implementation.

D. Organizational Impact

This factor can be considered as a reciprocal impact between organizations and technology. The first impact focuses on organizational resistance, the level of readiness for change, and the suitability of organizations with ERP systems. The second impact can be explained by the contribution of technology to improving organizational performance at the tactical and strategic operational level. The criteria for measuring the impact of work groups on the success of ERP system implementation include the suitability of organizations with systems, management of organizational resources, organizational performance, organizational productivity, organizational competitive advantage, and reduction in the organization's operational costs [14].

Hypothesis 4: Organizational impact has a positive and significant influence on the success of ERP system implementation.

E. Top Management Support

This factor leads to the commitment given by the executive or leadership to the diffusion of innovation. This factor is considered very important because the executive or top management make quick and effective decisions, resolves conflicts, brings everyone to the same mind to promote broad project acceptance and build cooperation between various groups within the organization [18].

Hypothesis 5: Top management support has a positive and significant influence on the success of ERP system implementation.

F. Vendor and Consultant Quality

Both vendors and consultants are grouped together because they have provided a source of external expertise to organizations regarding ERP system implementation. This factor can be considered as an external factor that contributes to carrying out an ERP integration project throughout the product life cycle. The criteria for measuring vendor quality and consultants include quality of vendors and consultants [10], communication and collaboration with vendors and consultants [19], and consulting services [20].

Hypothesis 6: Vendors and Consultant quality have a positive and significant influence on the success of ERP system implementation.

G. System Quality

System quality can be defined in many attributes such as data accuracy, database contents, ease of use, ease of learning, easy access, usability, realization of user needs, system accuracy, system flexibility, system reliability, system integration, system sophistication, features and functions system, system integration, system efficiency, resource utilization, response time and turnaround time [11].

Hypothesis 7: System Quality has a positive and significant influence on the success of ERP system implementation.

H. Training and Education

Many ERP system adopters need the help of consultants during the implementation project. Sharing knowledge from an ERP consultant to internal employees is very important for success and facilitating the adoption of an ERP system by making proper planning in conducting training and development for users or employees in the company. The criteria for measuring the quality of training are the training programs provided [21] and the benefits of the training to ERP system users [22].

Hypothesis 8: Training and Education has a positive and significant influence on the success of ERP system implementation.

I. Business Process Reengineering

Business Process Reengineering and changes are very necessary because ERP systems are basically developed to improve business processes such as manufacturing, sales, and distribution. The new business process after reengineering business processes may be one of the factors that contribute to the success of ERP. The criteria for measuring the suitability of business processes with ERP systems is to assess the suitability of the company's business processes with functions in the ERP system [21]

Hypothesis 9: Business Process Reengineering has a positive and significant influence on the success of ERP system implementation.

J. Project Management

Project Management concerns the entire human, technological, and financial resources used to carry out an

ERP system project that respects the budget and estimates of scheduling. The thing that is used as a benchmark for assessing the management of implementation projects is constant strategic planning and project supervision [21].

Hypothesis 10: Project Management has a positive and significant influence on the success of ERP system implementation.

K. ERP Fit

This factor includes various constructions such as integrase, configuration, customization, compatibility, and conformity or alignment of technical implementation and ERP systems. System integration or configuration is considered a determining factor for success in the ERP implementation phase. The results of these factors can reinforce the statement that the importance of ensuring that all ERP modules can be linked to the operation of an ERP system that is smooth and allows the implementation of a successful ERP system [10].

Hypothesis 11: ERP Fit has a positive and significant influence on the success of ERP system implementation.

V. ANALYSIS AND RESULTS

A. Measurement Model Result

Testing the measurement model on two sides uses a significant level of 5% to determine the condition of the influence and the level of significance of the indicator on the research variable with the criteria if the resulting t value is greater than 1.67 [23].

Table 1. First Measurement Model Test Result

Indicators	T Values (N=85; CI= 95%; Ttabel: 1.67)	p Values	Significancy Level
II1 (user contribution)	0.046	0.963	Not Sig.
II2 (user performance)	1.948	0.052	Medium
II3 (user productivity)	1.662	0.097	Not Sig.
II4 (efficiency)	3.405	0.001	High
II5 (quality service)	3.724	0.000	High
II6 (user understanding)	1.751	0.081	Medium
II7 (ease of use)	3.077	0.002	High
IQ1 (ease of access)	1.698	0.090	Low
IQ2 (system accuracy)	1.677	0.094	Low
IQ3 (current information)	0.133	0.895	Not Sig.
IQ4 (relevance of information)	0.605	0.545	Not Sig.
IQ5 (full information)	0.644	0.520	Not Sig.
WGI1 (team communication)	9.904	0.000	High
WGI2 (answer)	12.307	0.000	High
WGI3 (team productivity)	9.179	0.000	High
WGI4 (work participation)	8.301	0.000	High
OI1 (company performance)	0.295	0.768	Not Sig.
OI2 (company productivity)	0.253	0.800	Not Sig.
OI3 (competitive advantage)	0.813	0.417	Not Sig.
OI4 (resource management)	0.162	0.871	Not Sig.
OI5 (cost savings)	2.120	0.035	High
TMS1 (executive policy)	1.660	0.098	Low
TMS2 (executive coordination)	1.921	0.055	Medium
TMS3 (facility allowance)	1.807	0.071	Low
TMS4 (executive decision)	1.005	0.315	Not Sig.
VCQ1 (vendor quality)	2.983	0.000	High
VCQ2 (quality consultant)	3.018	0.000	High
VCQ3 (vendor collaboration)	2.334	0.000	High
VCQ4 (consultant collaboration)	2.498	0.000	High
VCQ5 (consultation)	2.818	0.000	High
SQ1 (data distribution)	4.571	0.000	High
SQ2 (data security)	2.852	0.005	High
SQ3 (manage data)	4.445	0.000	High
SQ4 (systematic data)	4.755	0.000	High
SQ5 (low complexity)	3.245	0.000	High
TED1 (training program)	1.935	0.054	Low
TED2 (ability training)	2.174	0.000	High
TED3 (understanding training)	15.513	0.000	High
TED4 (resistance level)	15.353	0.000	High
BPR 1 (operational efficiency)	4.266	0.000	High
BPR2 (minimizing errors)	6.114	0.000	High
BPR 3 (alignment process)	6.312	0.000	High
BPR4 (feature maximum)	4.454	0.000	High
PM1 (strategic planning)	3.205	0.001	High
PM2 (project supervision)	3.633	0.000	High
PM3 (measurement performance)	4.142	0.000	High
PM4 (readiness assessment)	4.243	0.000	High
PM5 (process design)	2.962	0.003	High
ERPF1 (integration of functions)	1.893	0.059	Low
ERPF2 (partner collaboration)	0.723	0.470	Not Sig.
ERPF3 (needs met)	2.165	0.031	Medium
ERPF4 (function adjustment)	1.243	0.214	Not Sig.
ES1 (successful transaction)	12.031	0.000	High
ES2 (customer satisfaction)	17.097	0.000	High
ES3 (profit margin)	4.548	0.000	High
ES4 (access frequency)	0.548	0.637	Not Sig.

On the first significance test to see the level of significance of the indicator by looking at the value of outer loadings after going through the bootstrapping procedure. Some indicators such as II1, II3, IQ3, IQ4, IQ5, OI2, OI3, OI4, TMS4, ERPF2, ERPF4, and ES4 were deleted because the effect was less significant.

Table 2. Second Measurement Model Test Result

Indicators	T Values (N=85; CI= 95%; Ttabel: 1.67)	p Values	Significancy Level
II4	8.093	0.000	High
II5	6.771	0.000	High
II7	6.346	0.000	High
IQ1	4.222	0.000	Low
IQ2	3.278	0.001	Low
WGI1	11.761	0.000	High
WGI2	19.225	0.000	High
WGI3	9.209	0.000	High
WGI4	8.100	0.000	High
OI1	0.481	0.631	Not Significant
OI5	2.760	0.006	High
TMS1	6.181	0.000	Low
TMS2	5.962	0.000	Medium
TMS3	8.712	0.000	Low
VCQ1	7.145	0.000	High

Indicators	T Values (N=85; CI= 95%; Ttabel: 1.67)	p Values	Significancy Level
VCQ2	6.874	0.000	High
VCQ3	4.921	0.000	High
VCQ4	5.788	0.000	High
VCQ5	5.343	0.000	High
SQ1	8.217	0.000	High
SQ2	3.854	0.005	High
SQ3	6.559	0.000	High
SQ4	8.120	0.000	High
SQ5	4.367	0.000	High
TED3	18.470	0.000	High
TED4	17.287	0.000	High
BPR1	8.178	0.000	High
BPR2	7.978	0.000	High
BPR3	28.858	0.000	High
BPR4	5.522	0.000	High
PM1	5.358	0.000	High
PM2	6.649	0.000	High
PM3	9.653	0.000	High
PM4	5.780	0.000	High
PM5	4.485	0.000	High
ERPF1	5.860	0.000	High
ERPF3	2.033	0.043	Medium
ES1	18.449	0.000	High
ES2	18.615	0.000	High
ES3	5.140	0.000	High

On the second significance test to see the level of significance of the indicator by looking at the value of outer loadings after going through the bootstrapping procedure. All indicators significantly influence the latent variables except for OI1 variable.

B. Structured Model Results

Testing the inner model or structural model is done to see the relationship between research variables, significance values based on structural path parameter coefficients, and evaluation of structural models using R-Square [24]. Two-sided structured model testing uses a significant level of 5% to determine the condition and level of significance of variables on other variables in the study with criteria if the resulting t value is greater than 1.67 or p-value is greater than 0.1 (weak significance), 0.05 medium), and 0.01 (strong significance). The structural model testing is processed using smartPLS software with the bootstrapping procedure. In the subsample bootstrapping procedure is created with observations taken randomly from the original data set. This subsample is then used to estimate the PLS pathway model.

Table 3. First Structured Model Test Result

Path	Parameter Coefficient Structural Path	t Values (N=85; CI= 95%; Ttabel: 1.67)	p Values
II -> ES	0.318	1.393	0.164
IQ -> ES	0.273	1.056	0.291
WGI -> ES	0.098	0.671	0.502
OI->ES	0.004	0.023	0.982
TMS -> ES	-0.019	0.147	0.883
VCQ -> ES	0.108	1.144	0.253
SQ -> ES	0.006	0.045	0.964
TED -> ES	0.116	0.946	0.345
BPR -> ES	-0.062	0.499	0.618
PM -> ES	0.309	2.109	0.035
ERPF -> ES	-0.096	0.609	0.543

On the first significance test, Individual impact variable has a positive effect of 31.8% on ERP success but are not significance. Information quality variable has a positive influence of 27.3% on the ERP success variable but are not significant. Workgroup impact variable has a positive effect of 9.8% on the success variable ERP but are not significant. Organizational impact variable has a positive effect of 0.4% but not significance. Top management support variable has a negative influence of 1.4% on ERP success and not significant. Vendor and consultant quality variable has a positive effect of 10.8% on the success variable ERP but not significant. System quality variables have a positive influence of 0.6% on success and not significant ERP variables. Training and education variables have a positive effect of 11.6% on the success variable ERP but not significant. Business process reengineering variable has a negative effect of 6.2% on success and not significant ERP variables. Project management variables have a positive effect of 30.9% on the ERP success variable with a high level of significance. ERP Fit variable has a negative influence of 1.4% on ERP success and not significant.

Table 4. Second Structured Model Test Result

Path	Parameter Coefficient Structural Path	Value t (N=85; CI= 95%; Ttabel: 1.67)	Value p
II -> ES	0.352	1.900	0.049
IQ -> ES	0.266	1.918	0.056
WGI -> ES	0.144	0.793	0.428
OI->ES	0.037	0.670	0.503
TMS -> ES	-0.016	0.142	0.887
VCQ -> ES	0.114	1.207	0.228
SQ -> ES	0.007	0.449	0.650
TED -> ES	0.107	0.881	0.379
BPR -> ES	-0.026	0.210	0.834
PM -> ES	0.309	2.069	0.051
ERPF -> ES	-0.088	0.553	0.580

On the second significance test, Individual impact variable has a positive effect of 35.2% on ERP success and high level of significance. Information quality variable has a positive influence of 26.6% on the ERP success variable and weak level of significance. Workgroup impact variable has a positive effect of 14.4% on the success variable ERP but not significant. Organizational impact variable has a positive effect of 3.7% and not significance. Top management support variable has a negative influence of 1.6% on ERP success and not significant. Vendor and consultant quality variable has a positive effect of 11.4% on the success variable ERP but not significant. System quality variables have a positive influence of 0.7% on success and not significant ERP variables. Training and education variables have a positive effect of 10.7% on the success variable ERP but not significant. Business process reengineering variable has a negative effect of 2.6% on success and not significant ERP variables. Project management variables have a positive effect of 30.9% on the ERP success variable with a moderate level of significance. ERP Fit variable has a negative influence of 8.8% on ERP success and not significant.

C. *Discriminant Validity*

Table 5. Discriminant Validity Test (Fornell-Larcker)

Indikator	BPR	ES	ERPF	II	IQ	OI	PM	SQ	TMS	TED	VCQ	WGI
BPR	0.704											
ES	0.519	0.663										
ERPF	0.437	0.472	0.621									
II	0.703	0.669	0.312	0.689								
IQ	0.838	0.838	0.919	0.910	0.439							
OI	0.389	0.274	-0.120	0.707	0.743	1.000						
PM	0.284	0.387	0.690	-0.162	0.112	-0.291	0.716					
SQ	0.607	0.472	0.839	0.269	0.763	0.031	0.649	0.669				
TMS	0.352	0.432	0.622	0.275	0.473	0.332	0.488	0.289	0.711			
TED	0.534	0.690	0.507	0.685	0.402	0.012	0.563	0. 521	0.529	0.691		
VCQ	0.271	0.393	0.358	0.109	0.141	-0.053	0.404	0.359	0.390	0.391	0.709	
WGI	0.660	0.618	0.335	0.957	0.824	0.732	0.057	0.301	0.696	0.753	0.246	0.737
Ket.	Tidak Valid	Tidak Valid	Tidak Valid	Tidak Valid	Tidak Valid	Valid	Valid	Valid	Valid	Tidak Valid	Valid	Valid

Discriminant validity is used to measure how much a variable is stated to be completely different from other variables. High discriminant validity values provide evidence that a variable is considered unique and able to capture the measured phenomenon [24]. Discrimination is supported by evidence that structural measures that do not have to be theoretically interrelated, in fact, do not have a close relationship with each other. In practice, the coefficient of discriminatory validity must be much smaller than the coefficient of convergent validity. The results of the discriminant validity test with Fornell-Larcker state that the variables are business process reengineering, ERP success, ERP fit, individual impact, information quality and training and education are not different with others variable (less unique). The results of the discriminant validity test with the Heterotrait-Monotype Ratio of Correlations (HTMT) states that most of the variables in this study do not measure the same thing or contain indicators that do not overlap the respondents' perceptions of the variables affected because the value is less than 0.85 except for ERP success, ERP fit, and individual impact variables that have results above 0.85.

D. *Effect Size and Relevance Predictive*

An assessment of the effect size (f^2) should be done in a study. The value of f^2 is 0.02 which means the size of the influence is low, 0.15 means the size of the influence is moderate, and the value of 0.35 means the size of the influence is high [25]. While the coefficient of determination (R^2) is a way to assess how much endogenous variables can be explained by endogenous variables. The value of Q^2 greater than 0 (zero) shows that the feasible model is declared to have a relevant predictive value while the Q^2 value of less than 0 (zero) shows that the model is less feasible to be declared to have a relevant predictive value [26].

Table 6. Effect Size and Relevance Predictive

Variabel	Ukuran Efek	*R-Square*	*Redundancy*	*Communality*
II	-1.263			0.258
IQ	-0.040			-0.061
WGI	0.136			0.395
OI	0.274			1.000
TMS	0.145			0.327
VCQ	0.121			0.415
SQ	0.277			0.320
TED	0.907			0.227
BPR	0.454			0.363
PM	0.023			0.372
ERPF	2.627			0.078
ES		0.534	0.181	0.261

Individual impact, information quality, organizational impact, workgroup impact, top management support, vendor and consultant quality, system quality, training and education, business process reengineering, project management, and ERP fit variable able to explain 53.4% of ERP success variables. While 46.4% is explained by other variables outside the research model. Furthermore, the value of cross-validated redundancy which is equal to 0.181 indicates that this research model is feasible to be declared as having relevant predictive values.

VI. CONCLUSION

Based on the results of hypothesis testing by testing structural models it can be concluded that the hypothesis of individual impact variable, project management variable, and information quality variable are accepted, meaning the success of the ERP system implementation at PT. Toyota Astra Motor is influenced by individual contributions both from the level of acceptance of the ERP system by users and the contribution of key user, management of good implementation projects, and the quality of information obtained during the implementation phase. While the variables of workgroup impact, organizational impact, top management support, vendor and consultant quality, system quality, training and education, business process reengineering and ERP fit are rejected, meaning that those variables do not influence the success of ERP system implementation in. PT. Toyota Astra Motor.

REFERENCES

[1] F. Rahman, "Evaluasi Penerapan Enterprise Resources Planning (ERP) Terhadap Penyajian Laporan Keuangan (Studi Kasus Di PT. Surya Citra Televisi)," *Jurnal KREATIF: Pemasaran, Sumberdaya Manusia dan Keuangan,* vol. 6, no. 3, pp. 109-126, 2018.

[2] N. Basoglu, T. Daim and O. Kerimoglu, "Organizational adoption of enterprise resource planning systems: A conceptual framework," *The Journal of High Technology Management Research,* p. 73–97, 2007.

[3] A. Zouine and P. Fenies, "The Critical Success Factors Of The ERP System Project: A Meta-Analysis Methodology," *Journal of Applied Business Research,* 2016.

[4] M. I. Sabri, "Critical Sucess Factor Penerapan Value Engineering Pada Tahap Konstruksi Bangunan Gedung Pada

PT. X," Fakultas Teknik Program Pascasarjana Universitas Indonesia, Jakarta, 2011.

[5] M. Afriyano, E. Darwiyanto and G. A. A. Wisudiawan, "Perencanaan Strategis Sistem Informasi Menggunakan Metode Ward and Peppard Pada PT. Grahacipta Bangko Jaya," *e-Proceeding of Engineering,* vol. 3, 2016.

[6] S. Jaluanto and M. F. Devitayani, "Analisis Faktor-Faktor Penentu Keberhasilan Sistem Informasi Akuntansi Bank Di Kota Semarang," *Jurnal Ilmiah UNTAG Semarang,* vol. 4, 2015.

[7] O. and M. , Management Information System Tenth Edition, New York: Mc.Graw-Hill Companies, 2011.

[8] C. Wei, T. Liou and K. Lee, "An ERP performance measurement framework using a fuzzy integral approach," *Journal of Manufacturing Technology Management,* p. 607 – 626, 2008.

[9] S. Soltani, N. Elkhani and A. Bakri, "How Consultant Participation Lead to ERP Implementation Satisfaction: A study Upon the Iranian Industries," *IJCSI International Journal of Computer Science Issues,* pp. 313-323, 2013.

[10] S. Dezdar and A. Sulaiman, "Critical Success Factors for Erp Implementation: Insights from a Middle-Eastern Country," *Middle-East Journal of Scientific Research,* pp. 798-808, 2011.

[11] W. DeLone and E. McLean, "Information systems success: The quest for the dependent variable," *Information Systems Research,* vol. 3, no. 1, pp. 6-95, 1992.

[12] C. Shannon and W. Weaver, In: The Mathematical Theory of Communication, Urbana, IL: University of Illinois Press, 1949.

[13] N. Gorla and S.-C. Lin, "Determinants of software quality: A survey of information systems project managers," *Information and Software Technology,* p. 602–610, 2010.

[14] S. C. Wingreen, M. Mahdavian and H. Gupta, "An Investigation into Enterprise Resource Planning Implementation Success: Evidence from private and public sector organizations," *Conference Paper,* pp. 1-12, 2016.

[15] G. Gable, D. Sedera and T. Chan, "Enterprise systems success: A measurement model.," in *24th International Conference on Information Systems Association for Information*, Seattle, 2003.

[16] P. Ifinedo, B. Rapp, A. Ifinedo and K. Sundberg, "Relationships among ERP post-implementation uccess constructs: An analysis at the organizational level," *Computers in Human Behavior,* vol. 26, no. 5, pp. 1136-1148, 2010.

[17] B. Myers, L. Kappelman and V. Prybutok, "A comprehensive model of assessing the quality and productivity of the information system function: Toward a theory of information systems assessment," *Information Resources Management Journal,* vol. 10, no. 1, pp. 6-25, 1997.

[18] S. Sternard and S. Bobek, "Acceptance of ERP Solutions in Maturity Use Phase: Key Influence Factors for SAP and Microsoft Dynamics NAV," *International Journal of Productivity Management and Assessment Technologies (IJPMAT),* pp. 18-44, 2012.

[19] T. Somers and K. Nelson, "The impact of critical success factors across the stages of enterprise resource planning implementation," in *Proceedings of the 34th Hawaii international conference on System Sciences*, Hawai, 2001.

[20] S. Finney and M. Corbett, "ERP Implementation: A Compilation and Analysis of critical Success Factors," *Business Process Management Journal,* pp. 329-347, 2007.

[21] B. C. Villari and S. Jharkharia, "Critical Success Factors for ERP Implementation: A Classification," *Twelfth AIMS International Conference on Management,* pp. 1013-1022, 2014.

[22] J. Ram, M.-L. Wu and R. Tagg, "Competitive advantage from ERP projects: Examining the role of key implementation drivers," *International Journal of Project Management,* pp. 663-675, 2013.

[23] M. Lubis, M. Kartiwi and S. Zulhuda, "Privacy and Personal Data Protection in Electronic Voting: Factors and Measures," *TELKOMNIKA,* vol. 15, no. 1, pp. 512-521, 2017.

[24] A. Rifai, "Partial Least Square-Structural Equation Modeling (Pls-Sem) Untuk Mengukur Ekspektasi Penggunaan Repositori Lembaga (Pilot Studi Di Uin Syarif Hidayatullah Jakarta)," *Al-Maktabah,* vol. 14, pp. 56-65, 2015.

[25] N. R. Furadantin, "Analisis Data Menggunakan Aplikasi SmartPLS V.3.2.7," Universitas Palangka Raya, Palangkaraya, 2018.

[26] Irwan and K. Adam, "Metode Partial Least Square (Pls) dan Terapannya (Studi Kasus: Analisis Kepuasan Pelanggan terhadap Layanan PDAM Unit Camming Kab. Bone)," *Jurnal Teknosains,* vol. 9, no. 1, p. 53 – 68, 2015.

[27] Panorama, "2019 ERP Report: People, Process and Technology", Consulting Solution. Accessed at July 2019 from: https://cdn2.hubspot.net/hubfs/4439340/2019-ERP-Report-3.pdf.

[28] R. Carlton, "Ten ERP failure statistics that highlight the importance of getting it right first time around," ERP Focus, *White Paper*, 23rd August 2017.

[29] R. Ghosh, "A Comprehensive Study on ERP Failures Stressing on Reluctance to Change as a Cause of Failures," *Journal of Marketing and Management*, vol. 3, no. 1, p. 123 – 134, 2012.

[30] R. G. Saade, H. Nijher and M. Sharma, "Why ERP Implementation Fail – A Grounded Research Study," *Proceedings of the Informing Science + Information Technology Education Conference*, August 2017.

[31] S. Saeed, M. H. Memon, A. Shaikh, F. A. Abassi, M. A. Memon and S. M. R. Naqvi. "Implementation of Failure Enterprise Systems in Organizational Perspective Framework," *Int. J. of Advanced Computer Science and Applications*, vol. 8, no. 5, p. 54 – 63, 2017.

[32] A. R. Ahlan, M. Lubis and A. R. Lubis. "Information Security Awareness at the Knowledge-Based Institution: Its Antecedents and Measures". *Procedia Computer Science*, vol. 72, pp. 361–373.

[33] M. Lubis, R. Fauzi, A. R. Lubis and R. Fauzi. "Analysis of Project Integration on Smart Parking in Telkom University". *Proc. IEEE CITSM* 2018.

[34] M. Lubis, R. Fauzi, A. R. Lubis and R. Fauzi. "A Case Study of Universities Dormitory Residence Management System (DRMS) in Indonesia". *Proc. IEEE CITSM* 2018.