

ERP Performance Measurement AT PT Hero Supermarket using the IT Balanced Scorecard Method



Ibnu Fajar alam, Nilo Legowo

Abstrac – *The company realizes that IT plays an important role in advancing business processes in the company, one of the breakthroughs made by this division is to use ERP in the company for work efficiency and reduce company costs, but with time the company is unable to achieve sales targets, while we know that ERP (SAP) is not cheap, with this problem we conduct research assisted by the Balanced Scorecard IT method, we can measure ERP performance that is already running. With four perspectives we measure ERP performance in a company. We disseminate data to 186 respondents to see whether ERP performance is good, then we get results from these four perspectives that support the performance of the ERP system. The results of this study are given to management to see whether the ERP performance that has been used is good or not, after that we can determine what should be done by the management*

Keyword : ERP, measurement performance, It Balanced scorecard

I. INTRODUCTION

Along with the times, the presence of retail business in the community is increasingly important. This is due to changes in the factors that influence consumer behavior in purchasing decisions. Studying and analyzing consumer behavior in purchasing decisions is important. The consumer's perspective on the retail business which was originally seen as a supplier of goods, but now, but now it is a business innovative, dynamic and competitive. At this time in the era of globalization, the economic and business world has a high competition intensity. In the current era of globalization the development of technology and communication systems more sophisticated so that people can easily communicate with each other. This causes the goods and services market to be more innovative. The competition is getting tougher with the current era of globalization, not only competing with state companies themselves but competing with foreign state companies. As we know that implementing ERP is not a low cost, therefore the author wants to measure ERP performance at PT Hero Supermarket using the IT Balanced Scorecard method

As we know that implementing ERP is not a low cost, therefore the author wants to measure ERP performance at PT Hero Supermarket using the IT Balanced Scorecard method, by measuring using four perspectives we can find out the perspective that supports ERP performance or we can find out the perspective which does not support ERP performance

II. STUDY LITERATURE

Measurement (measurement) is observation and quantification and a phenomenon, which is formulated in a list of criteria [1], what is meant is that in the measurement of observation actions are needed on objects based on predetermined criteria. measurement criteria or parameters are tools that become the main thing that must be determined before the measurement is made. Company performance is something that is produced by a company in a certain period with reference to the standards set, According to [2], performance can be interpreted as a measure of organizational success in achieving its mission, Performance measurement is a measuring tool used to achieve good results in a organization both individually and as a team so that performance can be understood and managed properly to achieve the goals, standards and competencies of the company [3]. ERP (Enterprise Resource Planning) is a computer based system that is designed to process company transactions and facilitate integrated and real time planning, production, and consumer response [4], ERP (Enterprise Resource Planning) is a multi-module, application solution business packaging that allows organizations to integrate business processes and company performance [5], general data distribution, resource management and provide actual access to information. This ERP (Enterprise Resource Planning) system has shown offers in the form of significant improvements in efficiency, productivity, profitability , service quality, customer satisfaction, decisions to minimize costs and effective decision makers [6]. Currently the authors measure performance with the IT balanced scorecard method, the reason why the balaced scorecard was chosen because the authors assume that the IT Balaced scorecard is still the right measurement tool for measuring performance, The use of IT Balanced Scorecard is one of the most effective ways to help align IT and business . The aim is to create a facility for management reporting, foster consensus among key stakeholders regarding IT strategic objectives, demonstrate the effectiveness and added value of IT and communicate IT performance, risk and capability [7] There are 4 IT balanced scorecard parameters according to [7] :

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1. Company Contribution
 - to enable and contribute to the achievement of business objectives through the effective delivery of value-added information services.
2. User Orientation
 - to be the supplier of choice for all information services both directly and indirectly through supplier relationships
3. Operational Excellent
 - provide timely and effective service at the targeted level and cost of service.
4. Future Orientation
 - to develop internal capabilities to continuously improve performance through innovation, learning, and personal organizational growth
 - with these four perspectives we can measure the performance of the ERP system that runs on PT Hero Supermarket

Each of the four perspectives must be interpreted into simple metrics and the steps must be in accordance with the current situation. Each of these assessments must be carried out systematically and must be confronted with the goals that must be determined in advance and with a comparison number. What is very important is that in IT BSC cause-effect correlations are formed and the relationship between the two types of actions, performance drivers and outcome measures. A well-made IT BSC requires the right mix of these two types of actions. The stated outcome measures such as programmer productivity without performance drivers (such as IT staff education) do not communicate how results will be obtained. And also - performance drivers without outcome measures can lead to meaningful investments without measurement if the strategies set are good and effective. This cause-and-effective relationship must be explained throughout the BSC

With the IT Governance balanced scorecard, organizations can empower management, CEOs, CIOs, executive management, and business and IT participants by providing them with the information needed to act and achieve a better integration of business and IT and, consequently, achieve better the results. In this case, the IT Governance scorecard can play an important role in the overall program that must exist to improve corporate governance [8] as you can see at (figure 1)

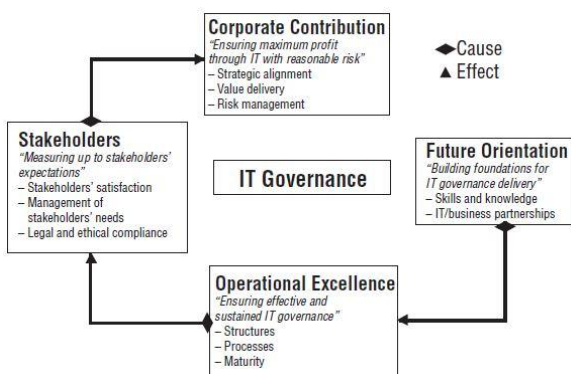


Figure 1 IT Governance Balanced Scorecard [8]

III. RESEARCH METHODS

ERP performance measurement at PT HERO SUPERMARKET uses the IT Balanced Scorecard method.

The selection of indicators and variables is done by looking at and looking for literature studies on research and journals that are in accordance with the ERP system, from the results of the indicators we will make questions in the questionnaire. The output will be analyzed and become a KPI (Key performance Indicator) which will be useful as a report measuring the performance of the ERP system

This research begins by identifying the ERP that is used (SAP IS Retail) after which we formulate the problem to be solved, then conduct a literature study with the journals that have been made previously relating to it balanced scorecard. after that researchers determine and look for indicators based on literature studies that become a reference by using 4 IT perspective balanced scorecard, which then becomes a reference as material for making questionnaires and interview statements. questionnaires will be given to employees who use SAP in the IT, MFT.MD, Accounting, CPO, Operation Store areas at headquarter, and interviews will be conducted with Data center staff, CPO management, MD Management who often use ERP systems (SAP) . after this data has been collected it is processed using Smartpls to measure hypotheses

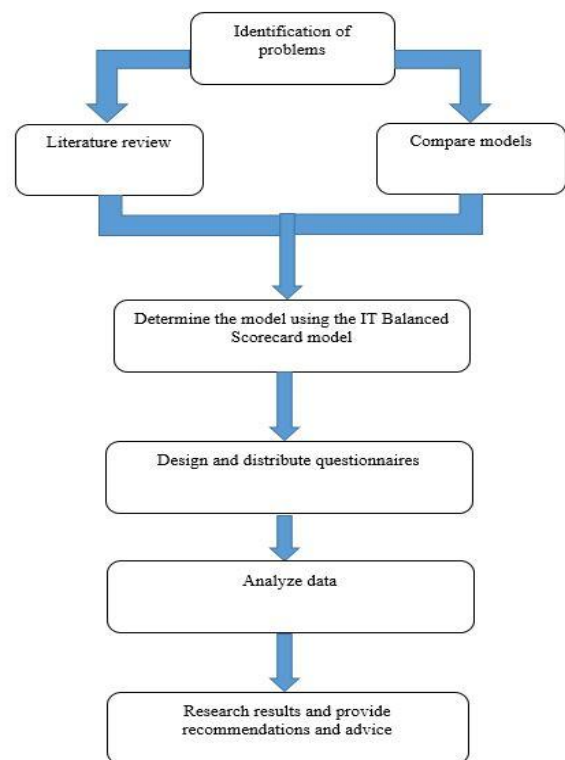


Figure 2 Research flow

after we get the model, we create indicators from 4 perspectives and ERP performance variables. This indicator will be a statement in a questionnaire, the following is a research model that has been made

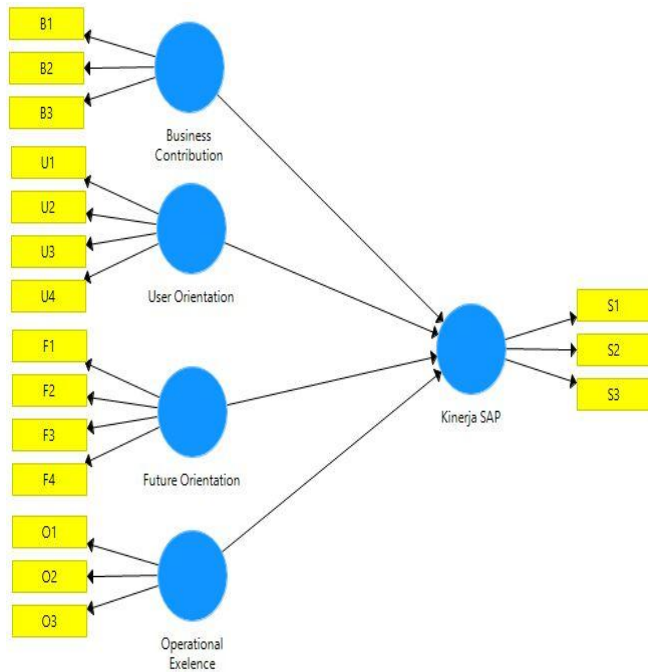


Figure 3 Research model

IV. DISCUSSION AND RESULTS

Validity and reliability tests must be carried out before we further process the data. We do the validity and reliability tests on all indicators in variables, business contribution variables, user orientation variables, operational excellence variables, future orientation variables, and SAP performance variables. Validity and reliability tests are done temporarily with a sample size of 30, we do this so we can make changes to the data if the data is invalid

the data is considered valid if it's greater than 0.361 (r table 30 = 0.361) while for the reliability test, a data is considered reliable if the Cronbach alpha is greater than 0.7 [3]

The following results are 5 variables with 17 indicators
Table 1 Validity test sample

Indicator	R Count	r Tabel (30 Sample)	Information
B1	0.745	0.361	Valid
B2	0.811	0.361	Valid
B3	0.872	0.361	Valid
Cronbach Alpha		0.840	Reliable
U1	0.872	0.361	Valid
U2	0.928	0.361	Valid
U3	0.730	0.361	Valid
U4	0.791	0.361	Valid
Cronbach Alpha		0.825	Reliable
F1	0.695	0.361	Valid
F2	0.790	0.361	Valid
F3	0.877	0.361	Valid
F4	0.741	0.361	Valid
Cronbach Alpha		0.807	Reliable

O1	0.912	0.361	Valid
O2	0.911	0.361	Valid
O3	0.857	0.361	Valid
Cronbach Alpha		0.861	Reliable
S1	0.696	0.361	Valid
S2	0.704	0.361	Valid
S3	0.679	0.361	Valid
Cronbach Alpha		0.769	Reliable

like the data above we can see that the data is valid and reliable, so we can proceed to 186 samples. this we do with the smartpls application to measure confirmatory factor analysis

Confirmatory Factor Analysis

After we have tested the validity and reliability test then we must then test the hypothesis and the problem of the possibility of the measurement error being considered complete or assumed to be "error free". In fact, according to some experts that, "all constructs have some measurement errors, even with the best indicators variables".[9],

Thus, if all constructs cannot be free from measurement errors even with the best indicators, then the problem now is that an analytical method that powerful analyzes and tests the suitability of the proposed construct or measurement model is needed. The method of analysis that is able to facilitate this work is confirmatory factor analysis

So, CFA is a factor analysis that is used with the aim to test or empirically confirm a measurement model of one or several constructs. Measurement model or also called descriptive model [5] after we get 186 sample data we calculate CFA using Smartpls 3, a factor weight of 0.50 or more is considered to have a validity strong enough to explain the latent construct, we get the data as below

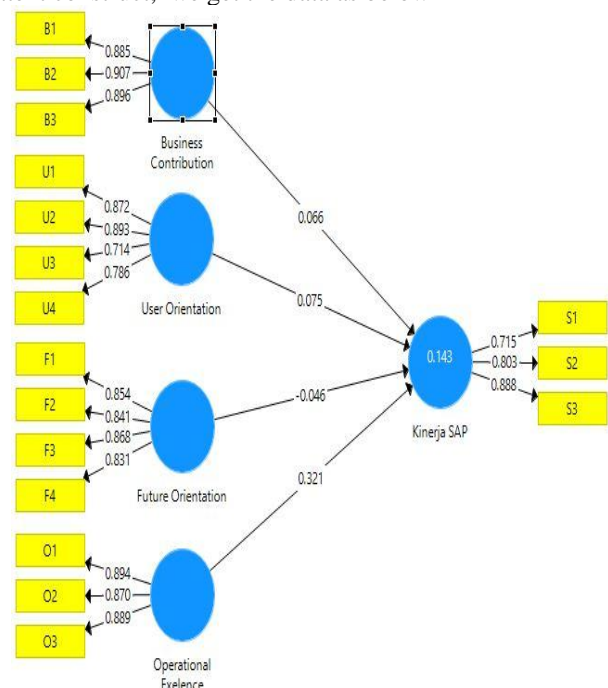


Figure 4 Path Diagram

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The convergence validity test is done by evaluating the value of the loading factor and accepting an indicator with a loading factor > 0.7 (absolute value of external standard loadings or called outer loadings). Based on the loading factor table, all indicators of each variable have a loading factor > 0.7. Therefore, the indicators used have met the requirements of the convergence validity.

Tabel 2 Loading Factor

Variabel	indicator	Loading Factor	Information
Busines Contribution	B1	0.885	Valid
	B2	0.907	Valid
	B3	0.896	Valid
User Orientation	U1	0.872	Valid
	U2	0.893	Valid
	U3	0.714	Valid
	U4	0.786	Valid
Future Orientation	F1	0.854	Valid
	F2	0.847	Valid
	F3	0.868	Valid
	F4	0.831	Valid
Operational Exelence	O1	0.894	Valid
	O2	0.87	Valid
	O3	0.889	Valid
SAP	S1	0.715	Valid
	S2	0.803	Valid
	S3	0.888	Valid

The AVE value is used to measure the amount of variance that can be captured by its construct compared to the variance caused by measurement errors. AVE value must be greater (> 0.5) Formula AVE :

$$AVE = \frac{\sum \lambda_i^2}{\lambda_i^2 + \sum_i var(\epsilon_i)}$$

formula AVE

Where λ_i is the component loading to the indicator and $var(\epsilon_i) = 1 - \lambda_i^2$ Convergent validity test is shown with the value AVE > 0.5 [10]

Based on the AVE table, all variables have a value of AVE > 0.5 so that all variables are declared valid

Tabel 3 AVE

Variabel	AVE	Information
Busines Contribution	0.803	Valid
User Orientation	0.672	Valid
Future Orientation	0.720	Valid
Operational Exelence	0.782	Valid
SAP Performance	0.648	Valid

t statistical test basically shows how far the influence of one independent variable individually in explaining the dependent variable [11] This test is carried out using a significant level of 0.05 ($\alpha = 5\%$). Acceptance or rejection of the hypothesis is carried out with benchmarks as follows:

1. If the value of t arithmetic < t table (1.97) then H0 is accepted then the hypothesis is rejected (regression coefficient is not significant). This means that partially independent variables do not have a significant effect on the dependent variable.
1. If the value of t arithmetic > t table (1.97) then H0 is rejected then H1 is accepted (significant regression coefficient). This means that partially the independent variable has a significant effect on the dependent variable

Table 4 Path coeefisien

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Information
Business Contribution -> Kinerja SAP	0.066	0.07	0.092	0.722	0.472	rejected
Future Orientation -> Kinerja SAP	-0.046	-0.034	0.116	0.394	0.701	rejected
Operational Exelence -> Kinerja SAP	0.321	0.308	0.109	2.951	0.003	Accepted
User Orientation -> Kinerja SAP	0.075	0.097	0.114	0.654	0.531	rejected

Based on the table above, we can see that there are only 1 variable of 4 variables that have a significant effect if we look at the T Statistic, which is the Operational Excel Variable, while we get 3 variables that have no significant effect on SAP Performance Variables, namely Busines contribution, Future Contribution, User Orientation

V. CONCLUSION

This research has carried out a process of data analysis and testing of four hypotheses, hypotheses submitted according to theoretical justification, t test statistics basically show how far the influence of one independent variable individually in explaining the dependent variable [3], Based on the results above (table 4.4) we can see that there are 1 variables that affect ERP performance (SAP), namely Operational Exelence and there are 3 variables that are not affected by ERP performance (SAP), these results can be used as a combination or guide for companies in improving and developing ERP systems (SAP) for companies

In achieving company performance targets, both vision and mission certainly requires strategic planning, solid team support and adequate information technology facilities and infrastructure. The strategy must be able to realize the creation of synergy between stakeholders in the company. The results of this study have positive implications for the planning, implementation and development of companies, especially in the field of information technology and can be taken into consideration in improving the ability to make decisions about the development and investment of corporate information technology in the future.



Managerial implications obtained in this study can be described as follows:

This study succeeded in obtaining empirical evidence that Operation Excellence has a significant influence in terms of planning, implementation and development of corporate technology in this case the ERP system (SAP) against work improvement. Based on the results of the analysis note that the significant value for Operation Excellence is 2,966 that shows Operational Excellence has an influence on the development of company technology that is currently still considered to be lacking by respondents. This is also strengthened by the results of the analysis of open statements existing in the company so far, besides that with this research the user indirectly provides an assessment and contribution to the implementation that has been given by the company so far in the future the user can better utilize the results of the technology that has been developed by the company to achieve the company's vision and mission.



Nilo Legowo, Associate Professor in Graduate Program in Information System Management at Bina Nusantara University completed his undergraduate Education Management at Surabaya State University in 1989 and continued his Masters degree in Informatics Engineering at the STTIBI graduated in 1997, and Doctoral Program in Management Research at Binus University graduated 2018. Being a lecturer since 1997 began teaching in various Private Universities in Jakarta in the fields of Computer Science and Information Systems. Since 2009, he has joined faculty member at the Computer Science Department of Bina Nusantara University as a Subject Content Coordinator (SCC) in the field of Software Engineering. Since 2011 he has been assigned as Deputy Head of Department to manage the Postgraduate Program in Information Systems Management.

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AUTHORS PROFILE



Ibnu Fajar Alam - Born in Jakarta on April 2, 1983, currently a student who is taking a Masters degree at the University of Bina Nusantara majoring in Magister Management Information System has a background in computerized accounting from Bina Nusantara University in 2007, more than 12 years working in the field of IT Infrastructure, he mastering network science, Linux, intalation cash register, project management, risk management and instalation windows server. He lives in Jakarta, Indonesia and currently works at the largest retail company in Indonesia as IT Infrastructure. He heads several employees in stores throughout Indonesia. Currently he is completing a thesis to get a Masters in Management. information Systems