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IT balanced scorecard (IT BSC) based strategic framework for assessing the impacts of Business Strategic-IT alignment

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Abstract. Alignment of IT strategy with business strategy to optimize the achievement of organizational goals. In general, there is a paradox between the application of information technology to the productivity directly. This paper aims to determine the suitability of the IT strategy with business strategy on company X by measuring IT Balanced Scorecard. The strategy implemented over a period of five (5) years. The study was conducted in the year to three (3). The results showed a low maturity level of application of IT for IT investment has not been implemented in accordance with the IT strategy. Anticipated funding has gradually become the cause of IT investments cannot be done thoroughly. The study presents recommendations for improvements every perspective ITBSC to achieve the expected level of maturity in the fifth year.

1. Introduction

Many studies have shown discrepancies in Strategic Business-IT alignment is the main reason for the failure to realize the full potential of IT investments [1], Organization alignment with Information Technology Strategy needs to be done to improve the organization's productivity [2], In general, there is a paradox between the application of information technology with the productivity directly [3]. Ward and Peppard [4] explained that the problem occurred because the productivity paradox of IT investment / IS still has not managed to make a real contribution expected by the organization. In some cases, not all of the work program ICT department supports the business processes and aligned with the organization's vision and mission. IT usage and sometimes impede the operations in an effort to trap binding.

There is a very important system in some parts of the business, but difficult for another section [5], Example Usability and Security in User Interface Design, obstacles often encountered is the application of multiple layers of security, such as the Multi-Factor Authentication, which affects the user-friendly experience [6], The gap occurs between the use of IT and finance. In terms of the financial department, the contribution of ICT adoption and utilization sometimes only judged Tangible value, which represents the only measured the benefits from Increased Sales, Reduced Operating Costs, and Reduced Interest Costs, whereas the IT investment which is necessary not directly visible in the form of profits [7].

This study is held in one of private manufacturing industry in Indonesia. Measurement of the weight of the fit between IT strategy IT organizations use a combination of Balanced Score Card and SWOT analysis. The study was conducted in Mining Equipment and Machinery Company with the



goal of increasing productivity and optimizing production between consistency and reliability in the life circle of lead time. Shorter lead-time have been the key challenges for a manufacturing industry Findings Based on study investigates by Woosang Hwang in the role of ERP in the supply chain [8], The results of the research will provide insights for companies to see the maturity of IT implementation in harmony and synergy with the organizational strategy.

2. Literature review

The Mining equipment manufacturing company in the field of a company that sells products that are directly usable by the mining company. Utilization of IT becomes imperative for companies to be able to achieve optimal organizational goals. IT Investment financing used by companies where the study was conducted using the method of financing gradually. Management of IT resources in the company, faced with an alternative choice to develop its own infrastructure with considerable investment value (in-house resource) or services contract Information Systems (IS) with a third party (outsourcing). Overview Re-Engineering as in Figure 1.

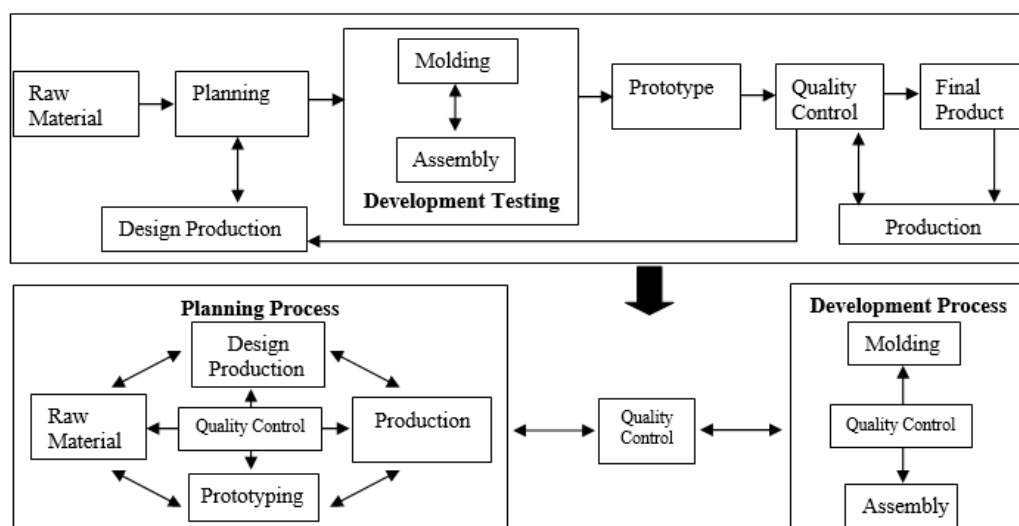


Figure 1. Re-engineering IT

2.1. IT Balanced Score Card (BSC-IT)

Measurement of the specific IT needs to be done to develop into the IT-BSC BSC [9]. Perspective ITBSC in this study was supported objectives specifically match the needs of the organization in which to do research.

2.1.1. Corporate objective perspective

- Strategic Business-IT alignment (CSF-1), IT utilization is used in accordance with the technology and market development needs of users [10], The Open Group Architecture Framework (TOGAF) [11] a framework the use of IT to meet the development needs of the user. Business success depends on the relationship business strategy, information technology strategy, infrastructure and enterprisaal processes, and IT infrastructure and processes [12],
- IT Service Management (CSF-2) is the craft of implementing, managing, and delivering IT services to meet the needs of an enterprise. In this paper, the main focus in IT management is to optimize IT initiatives to achieve maturity process in the manufacturing automation systems.

2.1.2. Customer perspective objective

- Satisfaction Service Performance (CSF-3). The relationship between employee satisfaction, customer satisfaction and organisational performance very tightly. Competition is getting tougher

between service companies because many aspects support accelerated change, but consumers are getting smarter. so that progressive improvement and development must periodically be explored in order to achieve the enterprise's vision

- Interactive Support Service (CSF-4) is an important initiative to maintain the perception gap of quality between the services provided and user expectations.

2.1.3. Operational excellence objective

- Reduce Complexity (CSF-5) , Complexity Reduction helps reveal hidden costs and allows companies to determine which products are making money, what customers really value and which enterpriseal or process bottlenecks are getting in the way of effective actions, setting the stage for greater growth and increased profits.
- Technology capability (CSF-6) is the ability of the enterprise to execute any relevant technical function, including the ability of technological knowledge in order to Reduce Complexity and develop new processes for efficiency [13]
- Maturity process (CSF-7) In order to continuously improve performance, enterprises need to control their processes. To do this it is assumed that enterprises need a high level of business process management maturity and employees need a high level of knowledge and experience. Proof of this hypothesis has been found in many empirical studies.

2.1.4. Future perspective objective

- Effective Cost Management (CSF-8)
The best way to achieve effective is using cost control. it mean concerned with measuring variances from the cost baseline and taking necessary actions to achieve minimum costs possible. Because Effective Cost Management is one of the main measures of business accountability
- Employees Job Satisfaction (CSF-9)
Job satisfaction contributors in this study were built on two aspects, namely opportunities to use skills and abilities, and trust between employees and senior management.

3. Methods

Methodology of this research is the empirical investigation against a particular phenomenon. The phenomenon in question is Convergence and Integration Strategy in Business-IT Alignment, aligned Reviews. These types of companies have increased the efficiency of technology investments and significantly reduced the financial and operational risks associated with business and technical change. Questionnaire with linker scale will be processed in accordance with the weighting matrix and SWOT IT-BSC. Weighting calculation performed using Analytical Hierarchy Process (AHP) and scoring system using the Key Performance Indicators (KPI).

4. Results and discussion

Respondents to the study were 30. Respondents were selected based on length of employment and job-related fields of research. Corporate strategy plan period 2019 - 2021 are presented in Tables 1 and 2.

Table 1. Strength and weakness mapping company

Code	Conditions map	Weight	rating	Thickness x Rating
S1	Good corporate governance and sustainability	.1035	3	.3105
S2	Focus on the tastes and needs of customers	.1035	3	.3105
S3	Strategic business location and spread	.1293	4	.5172
S4	Product quality trustworthy wider community	.1293	4	.5172
S5	supply chain Effective (lead time <3 days)	.1035	3	.3105
S6	A healthy financial ratios	.0603	2	.1206
S7	SI Existing web-based secure connection	.0605	2	.1210
S8	Already using ERP	.1118	3	.1118

Total				2.3193
W1	HR productivity is not optimal	.1293	3	.3879
W2	Investments in the field of IS / IT is not managed optimally	.0344	2	.0688
W3	Implementation of the solution / IT not yet have a framework	.0346	4	.1384
Total				.5951
Grand Total (SW)				1.7242

Table 2. Mapping opportunities and threats

Code	Conditions map	Weight	rating	Thickness x Rating
O1	Has a positive image in the community	.1305	4	.5218
O2	Target marketing is more than 25% can be achieved	.0261	3	.0783
O3	The growing potential new lovers	.1044	3	.3131
O4	The products have already become a tradition in the community	.1044	3	.3131
O5	Support rapid technological developments social media	.1044	3	.4175
O6	Utilizing the technology trends of cloud, mobile app	.1044	4	.4175
Total				2.0612
T1	Regulation limiting the number of product circulation	.1305	3	.3914
T2	The issue of the negative impact on the result of product consumption	.1044	4	.4175
T3	Dependency of raw materials	.1044	4	.4175
T4	Consumers easily replace other brands	.0607	3	.1822
T5	Market share is still dominated by a competitor	.0261	2	.0522
Total				1.4606
Grand Total (OT)				.6005

SWOT quantitative data above represents the conversion of an assessment by calculation SWOT Analysis developed by Pearce and Robinson in order to know exactly the position of the actual organization.

Figure 2 presents a SWOT coordinates are at 2, 0625 in progressive quadrant focused on strategic SO, which is a strategy to maximize the organization's internal strengths to seize opportunities. Table 3 and 4 present the strategy of SWOT adapted to IT.

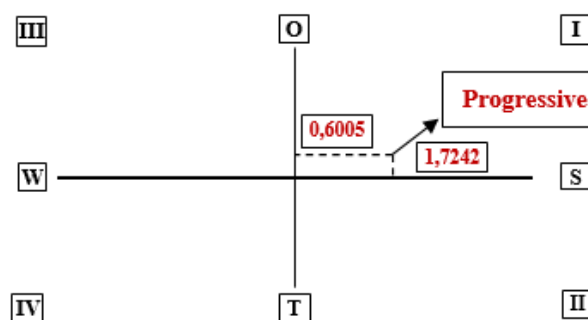
**Figure 2.** Coordinates SWOT

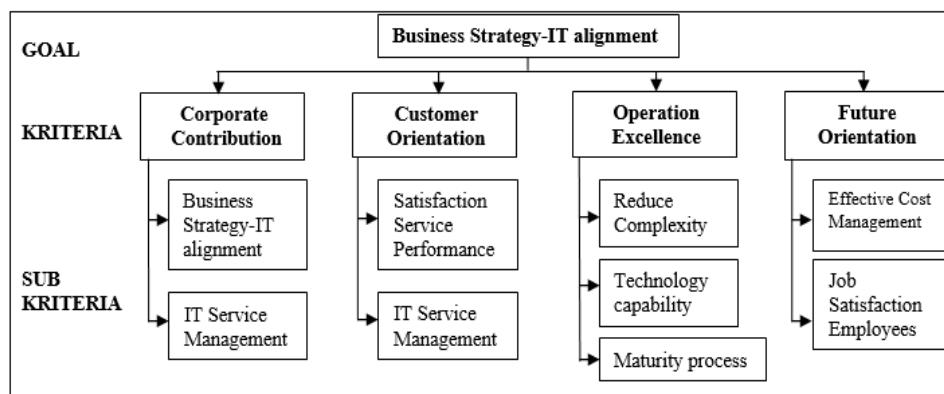
Table 3. The relationship between IT and business requirements initiative

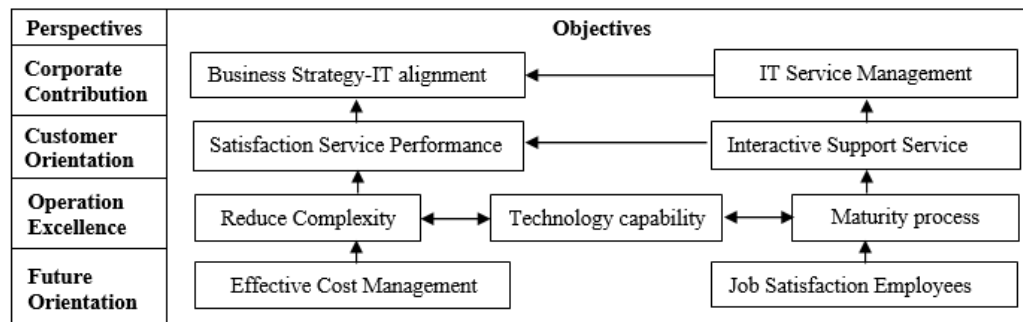
Code	IT Initiative	Originally code	Business Requirements (BR)	BR code
SO1	Integrating and Online Supply Chain systems	S4, O2, O3	Continuously grow in markets	BR 1
SO2	Support continuous updates directly to the apps without re-downloading	S6, O5, O6	Great user experience	BR 2
SO3	Manufacturing Automation Systems	S6, S8, O5, O6	Cutting lead times in processes	3 BR
SO4	High Availability IT Architecture	S6, S7, O6	Business continuity	BR 4
SO5	Protection of privacy in information systems	S4, S8, O5, O6	Protecting information from falling into the wrong hands	BR 5

Table 4. Results weighting objective KPI measurements of IT-BSC

Perspectives	Objective	KPI Measurements	Weight	Total
Corporate Contribution	Strategic Business-IT alignment	Tangible and intangible benefits in CBA	0154	0.247
	IT Service Management	Service Level Management	0093	
Customer Orientation	Satisfaction Service Performance	User satisfaction and loyalty index	0124	0.248
	Interactive Support Service	Support Availability	0124	
Operational Excellence	Reduce Complexity	Process Velocity	0062	0.255
	Technology capability	IT capability and business performance	0062	
	process maturity	Process Complexity	0124	
Future Orientation	Effective Cost Management	Traceability cost in IT investment	0166	0.250
	Job Satisfaction Employees	Total factor productivity (TFP)	0166	

Figure 3 illustrates the strategy and KPI targets are mapped in the hierarchy priority using AHP. Figure 4 illustrates the relationship of objectivity conduction in ITBSC.

**Figure 3.** Structure Hierarchy on KPI

**Figure 4.** The relationship between Objectives in IT BSC

IT application maturity calculation is based KPIs are presented in Table 5.

Table 5. Results of measurement

Perspectives	Objective	KPI Measurements	Weight	Target in -5th	Target Score	Realization in-3th	Score
Corporate Contribution	Strategic Business-IT alignment	Tangible and intangible benefits in cost benefit analysis	0154	> 80%	3	80%	3
	IT Service Management	Service Level Management	0093	> 95%	5	70%	2
Customer Orientation	Satisfaction Service Performance	User satisfaction and loyalty index	0124	> 90%	4	80%	3
	Interactive Support Service	Support Availability	0124	90%	4	70%	2
Operational Excellence	Reduce Complexity	Process Velocity	0062	> 90%	4	75%	2
	Technology capability	The relationship between IT capability and business performance	0062	> 95%	5	70%	2
	process maturity	Process Complexity Versus Process Capability	0124	> 90%	4	78%	2
Future Orientation	Effective Cost Management	Traceability cost in IT investment	0166	> 95%	5	85%	3
	Job Satisfaction Employees	Total factor productivity	0166	> 90%	4	70%	2

Weighting Procedure for Criteria and Measurement of Success of IT-BSC. Weighting calculations are carried out using the Analytical Hierarchy Process (AHP) method and scoring system using the Objective-Key Performance Indicator Matrix. In these calculations can provide a performance achievement score of each Objective based on the Key Performance Indicator (KPI) and know how to achieve it, so that action can be carried out according to the conditions of achievement. As illustrated in Table 6.

Table 6. Scoring Table based on traffic light

Score	Progress	Status	Action Recommendation
1	<60%	Warning	Evaluation and control
2	60% - 79%		
3	80% - 89%	Progressive	Evaluation and improvement
4	90% - 94%		
5	≥95%	Excellent	Maintained and followed

Based on the four perspectives that were examined, namely the company's contribution, customer orientation, excellent operations, future orientation each had each criterion with a score of 3 and 2 so that it entered into the Progressive and Warning status. The perspectives activated by Progressive status are Company Contribution with the Strategic Business-IT alignment objective, Customer Orientation with Service Satisfaction Objectives and Future Orientation objectives with an Effective Cost Management objective. As for the Warning status, the Company's Contribution with Objective IT Service Management, Customer Orientation with Interactive Support Service objectives, Operational Excellence objectively Reducing Complexity, Technology capability and process maturity, and Future Orientation with Employee Job Satisfaction objectives.

5. Conclusion

The position of the company based on SWOT mapping obtained on progressive quadrant. This means that the organization is in good shape and healthy. Low achievement of Operational Excellence in the year to -3 allegedly caused by the pattern of corporate financing gradually so that the benefits of IT cannot be measured before the 5th year. Further research needs to be done for proving suitability financing pattern with IT strategy and business strategy of the company. Perspective Operational Excellence has an impact on the other perspective. Further evidence needs to be done to determine the relationship between the degrees of perspective on the IT-BSC. The results of this study are practically is that external and internal ICT capabilities are important drivers of firm performance, while merely having integrated IS do not lead to better firm performance.

In addition, a moderating effect of the IS integration in the relationship between ICT capabilities and business performance is found, although this integration contributes to firm performance only when it is directed to connect with suppliers or customers rather than when integrating the whole supply chain. In general the achievement of KPI based perspective weighting on ITBSC not yet reached a level of maturity that is expected. Score each KPI parameters on ITBSC can be used as reference improvements to achieve the expected level of maturity. Operational Excellence perspective had the lowest scores on the achievement of KPI which at maturity level 2. Lead time is part of the Process Velocity is measured on Operational Excellence Reduce Complexity Perspective. Currently Score 70% of the target of more than 90%, acceleration batch-process lead time is expected to improve Operational Excellence. Future Orientation Perspective is necessary to increase in accordance with the parameters measured in the KPI that is Effective Cost Management and Job Satisfaction Employees

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