

DESIGNING OF IT STRATEGY MAP IN PUSAT SUMBER DAYA GEOLOGI BANDUNG

Rini Suwartika K, Janivita Joto Sudirham, Irawan Afrianto

Politeknik PIKSI Ganesha, Institut Teknologi Bandung, Universitas Komputer Indonesia
rinisuwartika@yahoo.com, janivita@gmail.com, irawan_afrianto@yahoo.com

Abstract

This paper will discuss several issues related to the design of the IT Strategy Map by using the method of John Ward-Peppard (2002) which includes the analysis of the external business environment, internal business analysis, IT Internal environment analysis and analysis of the external IT environment to determine business strategy of the agency concerned, as well as using IT Balanced Scorecard approach to determine IT management strategy.

The result showed that the five strategies, Strategies to Improve Quality of Human Resources (HR), Strategies to Increase Reliability of Operational, Strategic Use of Information Technology services, Strategies to Increase Cooperation and Creating alternative financing strategies. To ease the translation of such strategies on the area and the whole perspective of IT Balancescorecard target the information technology systems of these strategies can be formulated in the form of maps and mapped information technology strategies are aligned and balanced, so as to support the achievement of the PusatSumberDayaGeologi.

Keywords: Information Technology, Strategic Planning, SWOT Analysis, IT Balance Scorecard, IT Strategy Map

1. Introduction

PusatSumberDayaGeologi is a government institutions which moves in terms of disclosure of potential geological resources. The institution has implemented information technology as a means to achieve the vision and goals of the institutions business, but the implementation is not optimal when viewed from the side of the user and its benefits for organizations and communities.

In order for information technology investments that have been issued by comparable institution and aligned with the vision and objectives to be achieved, so one solution that can help solve those problems is made of strategic planning of information systems and information technology through the design of the IT IT Strategy Map through the framework of John

Ward and Peppard and IT Balance score card perspective.

To ease the translation of such strategies on the area and the whole perspective of IT Balance score card target the information technology systems of these strategies can be formulated in the form of maps and mapped information technology strategy., Where the depiction of a strategy map using KPI (Key Performance Indicator).

Strategy map is a diagram that shows the vision, mission, organizational strategy that is implemented in the daily activities at each business unit using the KPI (Key Performance Indicator).The map identifies the various things about the strategy of an organization to achieve its objectives. Strategy map contains at least four perspectives, learning and growth perspectives, internal process perspective, the perspective of the customer and financial perspective.

The results obtained from the design of the strategy map can be a work plan (action plan) that can be used as a reference in the implementation of SI and IT at the institution.

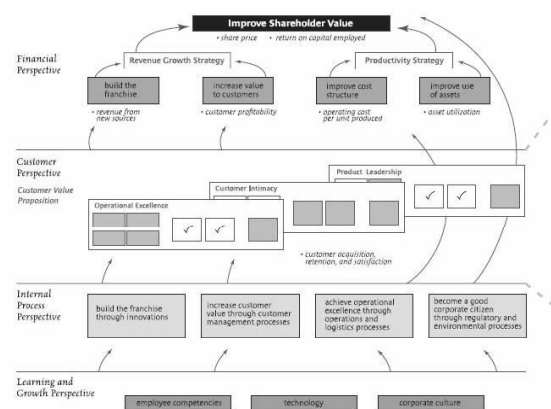


Figure 1. company strategic map

Balanced Scorecard is a performance votes system that support the viability and sustainability of organizational growth. Balanced Scorecard is a performance evaluation system integrating financial aspects with other aspects that are important to the organization. Balanced Scorecard strategic outlines into an integrated system that includes: Outcomes

(lag indicators) and Performance drivers (lead indicators) (Results and Performance System), Internal and External Perspectives, Qualitative and Quantitative Information, and Limited number of indicators.

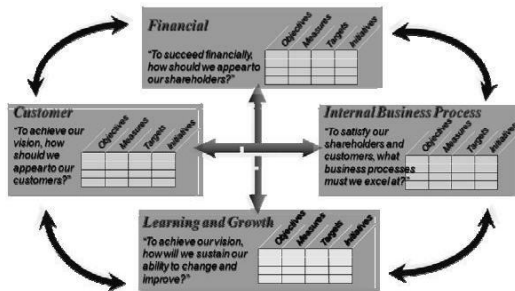


Figure 2. Framework BSC

The expected goals in the design of the study information technology strategy map is:

1. Knowing the business processes and the technology be applied.
2. Applying the method of IT Balancescorecard in developing business strategy and IT management strategy.
3. Mapping strategy of information technology.

2. Method (Methods)

Methods of data collection

Methods of data collection were performed using a literature study, interviews and disseminate the views and questionnaires. Where from interviews and literature studies acquired business process and the things that affect the business process goes on PusatSumberDayaGeologi. While the grouping of the questionnaire obtained Strengths, Weaknesses, Opportunities and Threats used in the SWOT matrix formation.

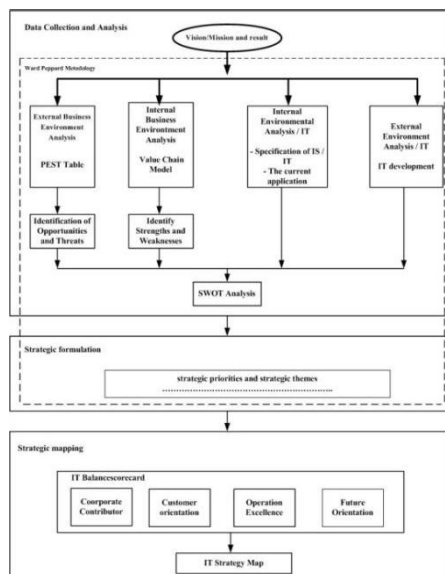


Figure 3. Research Methods

3. Results and Discussion

This section will discuss three stages according to the the research methodology, is:

A. Data Collection and Analysis

At this stage it will be discussed about, analysis of the external business environment, internal environment analysis of IS / IT, external environment analysis of IS / IT, followed by a SWOT analysis.

A.1 External Business Environment Analysis

At this stage of the tools used is PEST analysis (Political, Economic, Social, Technological). PEST analysis is obtained from recognizing and evaluating external opportunities and threats, so the company will be able to develop a vision and mission as a basis for appropriate strategies to achieve long-term goals.

Table 1. PEST Analysis

POLITICAL	ECONOMY
<ol style="list-style-type: none"> 1. Government regulations, through Act No. 5 of 2004 on the National Development Planning System (National Development Plan) and the Regulation of the Minister of Energy and Mineral Resources No.0030 of 2005 on the duties and functions of PSDG, directly affects PSDG in terms of determining planning tasks and activities to be carried out by the agency in support of national development. 2. UU No.41/1999 on Forestry, which led to a ban on mining activities open in protected forest areas making it difficult to obtain data on the location of the study. 3. The existence of local regulations that affect the activities of inquiry which resulted in different flow investigation process and criteria for investigation for each site investigation. 	<ol style="list-style-type: none"> 1. Economic growth is rapidly increasing influence PSDG in terms of budgeting operating costs of research. 2. Selection of research sites related to the costs 3. Cooperation with the private sector
SOCIAL	TECHNOLOGY
<ol style="list-style-type: none"> 1. Tendency of social change, culture and environment create conditions of exploration and research into different. 2. Cooperation of the private sector and foreign influence to PSDG in terms of improving the results of the study are optimal. 	<p>Changes in technology is rapidly increasing greatly affect the activity of exploration and research on PSDG especially in terms of information and communication technology</p>

A.2 Internal Business Environment Analysis

At this stage, the analysis of internal factors (effects of the) company with Value Chain Analysis Model. Value Chain Analysis to map the entire process that occurs in the organization of work into two categories of activities, namely the main activities and support activities.



Figure 4. Value Chain Analysis

A.3 Environmental Analysis Internal / IT

In the analysis of the internal environment of IS / IT will be discussed on Hardware specifications and software, and network infrastructure of the Center for Geological Resources.

a. Hardware (Hardware)

Computer device with the following specifications:

1. Computer device with a spec P4-up
2. LAN networks and the Internet

b. Software (Software)

Software that is used as follows

1. Operating System: Windows
2. Data processing applications: Office 2007
3. Data processing applications: Surfer 9, MapInfo 10, Discover 12, Corel 14, ENVI, ERMapper, rockwork, 2004, Logplot.
4. Applications that have been implemented:
 - a. Website PSDG: a web agency that presents data on the scope PSDG.
 - b. WebGIS: a sub web of web PSDG serving geographical data about geological resources.
 - c. SIMPEG (Employee Information System): a system that manages employee data
 - d. SIGNAS (National Geographic Information System): a system that presents data on the geology of national scope).
 - e. SI Library: a system that manages the data library.
 - f. Meta data: a means for presenting research data.
- b. Network Infrastructure
- c. Network infrastructure that is used on the Geology Resource Center using the Network Configuration LAN using star topology.

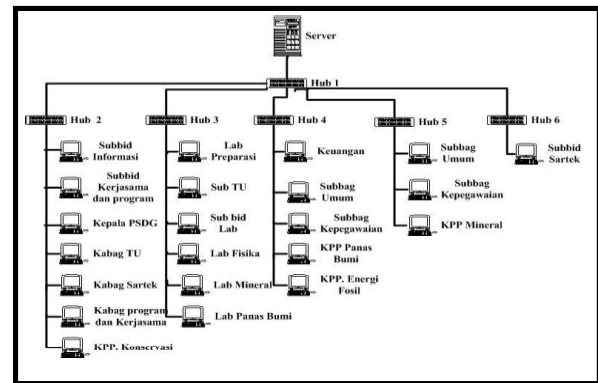


Figure 5. Network Configuration

A.4 External IT Environment Analysis

SI external environmental analysis aimed to determine the direction of the development of information systems applications, hardware, and computer networks.

A.5 Identification of External Factors and Internal Factors

Based on the analysis in the previous stage, this section will be elaborated on the identification of external factors and internal factors, where the results obtained from this identification is the position of the institution and used the SWOT analysis phase.

1. Identification of External Factors

At this stage, will analyze the external factors (outside influences) in relation to the impact to the company's business strategy, both in terms of opportunities or threats for the company.

Table 2. Identification of Opportunities and Threats In PSDG

Opportunities	Threats
1. Indonesia's geological resource potential is quite large and has not been entirely revealed	1. Political and policy changes.
2. Private investment in mining has increased.	2. The absence of national standards Reporting Resource Estimate and operating costs
3. Foreign cooperation programs for exploration and research available.	3. Yet the passage of geological data flow of resources to the Regional Center.
4. Field of technology services needs of geological resources is increasing	

2. Identification of Internal Environment

Analysis of the results obtained from the respondents to the questionnaire and model of the value chain can be identified Strengths and Weaknesses

Table 3. Identification of Strengths and Weaknesses in PSDG

Strength	Weakness
1. Authority holder data and geological information resources in Indonesia	1. Synchronization of database management of geological resources have not optimum
2. Aspects of Organization and Management has been supportive towards information technology	2. The ratio of non-technical and technical experts are not balanced
3. Engineering and network infrastructure have adequate internet	3. Standards / criteria of performance research, inquiry and service in the field of geological resources not available
4. Adequate quantity of human resources.	4. Research programs and services have not been optimal.
5. Opportunity for employees to pursue continuing education unruk higher.	5. With inadequate infrastructure maintenance technicians available.
6. Legality of investigation and research authority service area of geological resources	6. HR has not been optimally utilize information technology in support of the research process
	7. Use of computer networks is still underused in supporting employee performance.

External and internal identification based then made a SWOT matrix. Based on the number of frequencies that arise from strategic generated by the SWOT matrix then made a strategic priority.

A.6 Strategic Formulation

Priority strategy is one of the strategic themes resulting from the SWOT matrix where the priorities of this strategy can be seen any strategy that is considered important to do.

Table 4. Strategic Priorities of PSDG

Strategic Priority group	Strategic of Pusat Sumber Daya Geologi
I	<ol style="list-style-type: none"> 1. Increase the utilization of information technology services to the company's operations. 2. Improve operational reliability. 3. Creating strategic financing alternatives and share the risk of business operations 4. Improving the Quality of Human Resources. 5. Increase cooperation with various parties (bilateral and multilateral, inter-agency and autonomous regions).
II	<ol style="list-style-type: none"> 1. Improve the coordination of data management both internally and externally in an integrated manner. 2. Develop and implement standard operating / performance criteria (SOP) 3. Improve program planning and research investigations. 4. Improve monitoring and evaluation of program activities and performance of the organization.

A.7 Strategic Mapping

At this stage, will discuss the link between strategic priorities with IT Balancescorecard method so as to produce a map of the strategies according to the needs of the agency concerned.

1. Analysis IT Balanced Scorecard

On this analysis will be discussed on Balancescorecard analysis covering IT strategic goals, and score cards for each perspective.

Table 5. IT perspective strategic goal Balancescorecard

Perspective	Strategic Objectives	Strategic Strategis
Contribution Organization	Management executive shareholder	Creating strategic financing alternatives and share the risk of business operations
User Orientation	Costumer value	Enhance Customer value cooperation with various parties (bilateral and multilateral, inter-agency and autonomous regions).
Operational Excellence	Operations management, customer management, innovation management	<ol style="list-style-type: none"> 1. Increase the utilization of information technology services to the company's operations. 2. Improve operational reliability.
Future Orientation	Human capital, information capital, organizational capital	To Improve Quality of Human Resources.

A. Contribution Organization Perspective

Table 6. IT BSC approach in the perspective of the organization's contribution

Strategi (objective)	Creating alternative financing strategies and share the risk of operational research effort		
Organizational Contribution score card			
Aim	Benchmark	Target	Initiatives
Creating alternative financing strategies and share the risk of operational research effort	The ratio between the operational budget with the costs that used to affect the risk-sharing and the work done to support the implementation of the State Budget Allocation sound, credible and Sustainable	100%	a. Encourage control system b. Responsibility for the realization of transparent management and distribution of the estimated cost of business risk

B. User Orientation perspective (User Orientation)

Table 7. IT BSC approach in the perspective of the User Orientation perspective

Strategi (objective)	Enhancing cooperation with various parties (bilateral and multilateral, inter-agency and autonomous regions).		
User Orientation score card			
Aim	Benchmark	Target	Initiatives
Increase cooperation with various parties (bilateral and multilateral, inter-agency and autonomous regions).	Determine the level of compliance data and application by conducting a survey on the availability of data and applications needed by the customer	100%	<ol style="list-style-type: none">1. Identify the need for the type of data and applications needed by the customer.2. Develop an integrated information system that integrates services and cooperation to the various parties in the field of geological resources

C Operational Excellence perspective (Operational Excellence)

Table 8. Approach in the perspective of BSC IT Operational Excellence

Strategi (objective)	1. Increase the utilization of information technology services to the company's operations. 2. Improve operational reliability.		
Operational Excellence score cards			
Aim	Benchmark	Target	Initiatives
increase the utilization of information technology services to the company's operations and Improving operational reliability.	a. Knowing the level of ease of system use, by surveying the ease of use of the application b. Analyze whether the system has been fully integrated for all operational activities through COBIT audit	100%	a. Making the system easier to use the system. b. Developing information technology-based systems

D. Orientation Perspective future (Future Orientation)

Table 9. IT BSC approach in the Future Orientation perspective

Strategi (objective)	Improving the Quality of Human Resources.		
Future Orientation score card			
Aim	Benchmark	Target	Initiatives
Improving the Quality of Human Resources.	a. Determine the level of mastery of technology systems and applications used to conduct a survey to employees and does the integration of IS / IT b. An increase in the competence of human resources through training in IT	100%	a. Improve the competence of human resources through training fields related fields b. Propose a system of self-evaluation c. Utilization of information systems and technology to enhance and facilitate operations

B. Cause and Effect Relationship Analysis

At this stage is to evaluate the causal relationship of the various strategic objectives and benchmarks that have been.

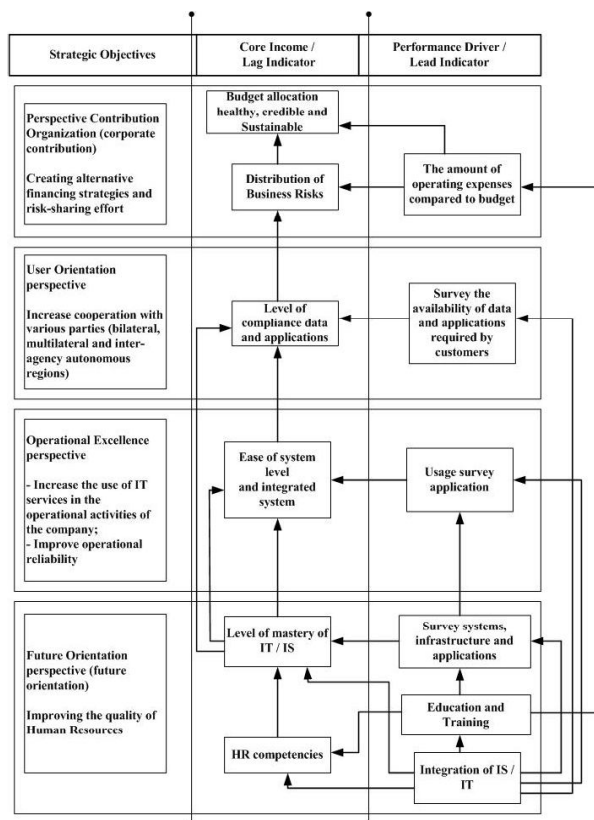


Figure 6. Cause and Effect Diagram

C. IT Strategy Maps (IT Strategy Map) at the Center for Geological Resources

This stage designed a strategy map, where the strategy map is a diagram that shows the vision, mission, organizational strategy that is implemented

in the daily activities at each business unit are grouped into the four BSC perspectives associated with the strategic priorities of the priority group I include Strategy to Improve Quality Sources Human resources (HR), Strategies to Increase the Reliability of Operations, Strategies to Increase Utilization of IT services In Operations, Strategies to Increase Cooperation and Strategic alternative Financing Strategy Creating and sharing business risk. Map this strategy can be used by the Geological Resource Center as a tool to communicate the strategy to all employees in the form of measures of operational activities.

For the next step is to implement these strategies into the design of a strategic management system complete with existing indicators. It would be better if the implementation is continuously evaluated on a regular basis and do adjustments every time something changes or circumstances that do not fit the form of the influence of internal and external agencies.

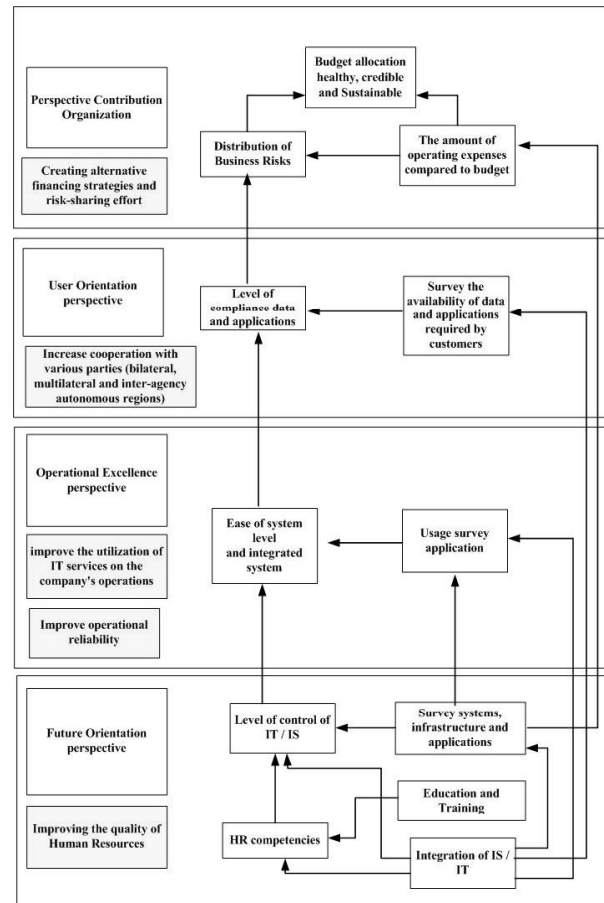


Figure 7. IT Strategy Map at PusatSumerDayaGeologi

4. Conclusions

The conclusion that can be derived from this study is the IT Balancescorecard method can be used

to map business goals, benchmarks, targets and initiatives that can be undertaken by the Center for Geological Resources strategies designed to map can be grouped into four perspectives associated with BSC IT priorities including strategic Strategies to Improve Quality of Human Resources (HR), Strategies to Increase the Reliability of Operations, Strategies to Increase Utilization of IT services In Operations, Strategies to Increase Cooperation and strategic alternative Financing Strategy Creating and sharing business risk. As well as the strategy map is expected to be a picture in developing, integrating and maximizing the information technology and used as a work plan (action plan) to achieve business objectives on Geologic Resource Center in the future.

5. References

1. Cohn, John M.,dkk. 2001. *Planning for integrated systems and technologies: a how-to-do-it manual for librarians*. New York: Neal-Schuman Publisher, Inc.
2. David Fred R., 2004.*Manajemen Strategis Konsep. Edisi Ketujuh*, PT Intan Sejati Klaten,.
3. Galliers, R.D., Leidner, D.E., 2003. *Strategic Information Managemen*, Elsevier Butterworth-Burlington : Heineman, ,.
4. Indrajit, Ricardo Eko. 2000. *Sistem Informasi dan Teknologi Informasi*. Jakarta: Gramedia.
5. Kaplan, Robert S. & David P. 2004, *Strategy Maps: Converting Intangible Assets into Tangible Outcomes*, Boston : Harvard Business School Publishing Corp.
6. Laudon, Kenneth C dan Jane P. Laudon. 2007. *Sistem Informasi Manajemen. Edisi ke-10*. Terjemahan Chriswan Sungkono dan Machmudin Eka P. Jakarta: Salemba Empat.
7. Pant, S., Hsu, C., 1995. *Strategic Systems Information Planning, Information Resources Management Association International Conference*, Atlanta-Georgia,.
8. Pemerintah Republik Indonesia .2005. *Peraturan Menteri ESDM NO.0030 tentang Tugas dan Fungsi Pusat Sumber Daya Geologi*. Jakarta
9. Pemerintah Republik Indonesia .2004 .*Peraturan Pemerintah No 5 mengenai system perencanaan Pembangunan Nasional (RJPM Nasional)*.Jakarta.
10. Rangkuti, F.2000, *Analisis SWOT Teknik Membedah kasus Bisnis Reorientasi Konsep Perencanaan Strategis untuk Menghadapi Abad 21*, Jakarta : PT. Gramedia Pustaka Utama,.
11. Remenyi, Dan, & Arthur Money, Alan Twite. 1995. *The Effective Measurement and Management of IT Costs an Benefits. 1st Edition*. Britain : Butterworth-Heinemann..
12. Umar, Husein. 2002.*Strategic management in action: konsep, teori, dan teknik menganalisa manajemen strategis strategic business unit berdasarkan konsep michael R. David, dan WheelenHunger*. Jakarta: Gramedia,.
13. Van Grembergen, W., Saull, R., and De Haes, S. . 2003.*Linking the IT Balanced Scorecard to the Business Objectives at a Major Canadian Financial Group*. Journal of Information Technology Cases and Application, Vol. 5, No. 1.
14. Ward, John.,& Peppard,Joe., 2003 .*Strategik Planning For Information system*. Third Edition, John Wiley & son Ltd,.