Adopted Method of Information System Strategy for Knowledge Management System: A Literature Review

Elin Cahyaningsih, Dana Indra Sensuse, Wahyu Catur Wibowo, Sofiyanti Indriasari

Abstract—Bureaucracy reform program drives Indonesian government to change their management to enhance their organizational performance. Information technology became one of strategic plan that organization tried to improve. Knowledge management system is one of information system that supporting knowledge management implementation in government which categorized as people perspective, because this system has high dependency in human interaction and participation. Strategic plan for developing knowledge management system can be determine using some of information system strategic methods. This research conducted to define type of strategic method of information system, stage of activity each method, strength and weakness. Literature review methods used to identify and classify strategic methods of information system, differentiate method type, categorize common activities, strength and weakness. Result of this research are determine and compare six strategic information system methods, Balanced Scorecard and Risk Analysis believe as common strategic method that usually used and have the highest excellence strength.

Keywords—Knowledge management system, balanced scorecard, five force, risk analysis, gap analysis, value chain analysis, SWOT analysis.

I. INTRODUCTION

INDONESIAN government starts to implement knowledge management as one of bureaucracy reform solution and emerge government law of knowledge management implementation in PERMENPAN No. 14 Tahun 2011. Knowledge management system as a technology tools for supporting knowledge management implementation in organization. Knowledge management system (KMS) is technologies application of IT, a support system of knowledge management process can develop according to the requirement based on problem and potential functionality [1]-[4]. KMS technologies required for each organization is different, it's depend on the knowledge management process that done in the organization [1]. Each of knowledge management process in organization need a specific knowledge management system for automated and support the activities. Generally knowledge management system can be divided into four types as knowledge discovery system, knowledge capture system, knowledge sharing system and knowledge application system [1].

Elin Cahyaningsih, Dana Indra Sensuse, Wahyu Catur Wibowo is with the Computer Science Department, University of Indonesia, Depok, East Java, Indonesia (e-mail: elincahyaningsih@gmail.com, dana@cs.ui.ac.id, wibowo@cs.ui.ac.id).
Sofiyanti Indriasari is with the Computer Science Department, Bogor Agricultural University, Indonesia (e-mail: chopies@gmail.com).

Knowledge management system is one of information system development in people perspective approach, because most of knowledge management system deliverable in human participation. It makes knowledge management become complex, specific and has a high dependence on human. The successful knowledge management system is in human participation. Delivering knowledge management system needs a deep analysis which one is the suitable and required in the organization.

Organization has to define the strategy for knowledge management system development. Strategies are steps to achieving long-term goals in the future. Organization strategy can define as a plan that ensures the development of organizational initiative. It means that organization should have a strategy as a plan and activities for knowledge management system initiative that align in organization knowledge management objective.

Define strategy for developing knowledge management system can be done using some strategic methods that usually used for information system development. Each of method has different role and stage of activities. Therefore consideration in the selection of methods for defining strategy on knowledge management system should be done properly. These considerations include: (1) What methods can be used to define strategy in knowledge management system? (2) What are the stages in each method? (3) What are the strengths and weaknesses of each of these methods? This research begins with present some of method for define strategy. Each objective, concept and stage of activities from the method will be discussed and explain more detail as a literature review from previous study.

A. Knowledge Management System Strategy

Knowledge management system can be derived as information system that implemented to manage organizational knowledge [5]. Knowledge management system also can be explain as a tools to support knowledge management process in various type of technology implementation such as repository, database expert, discussion list [6]. According to [1], knowledge management system is variety of knowledge management mechanism and technology that defined from knowledge management process in organization. Strategy is a perspective, position, plan, pattern, bridge, action, idea, experience as a guidance for specific stage of action [7]. Strategy development process model are stage of activities based on experience of strategy development using balanced scorecard, internal and external analysis, strategy map. This model consist of four stage, there

World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:8, No:10, 2014

are identify mission, vision, and value, define strategic goals, identify strategic analysis and define strategic formulation [8]. According to some opinion above, knowledge management system strategy can be interpreted as a guidance of plan and activities from experience for developing knowledge management technology in order to enhanced knowledge management implementation and reached organizational competitiveness.

B. Strategic Method

Strategic method is used to define the strategic steps in performing an activity. The Strategic method we will discuss is the methods for determining the IS Strategy to be adopted for define KM Strategy.

C. Balanced Scorecard

According to [9], balanced scorecard is an approach that used for defining organization strategic action, or activities based approach. Balanced scorecard also integrated and extend organizational future readiness, monitoring and controlling all key measurement [8]. Other researcher explain that balanced scorecard can ensure operational action as an appropriate strategy for many kind of organization user, level and management [10]. Reference [11] stated that balanced scorecard is relevant tool for articulate strategic and operational management process in organization [12]. Balanced scorecard perspective are financial, customer, internal business process and learning and growth [9], [8], [12]-[15]. According to some definition above, balanced scorecard can be extend as an approach for developing organizational strategy by delivering organization vision, mission, strategic goal and objective into four perspective financial, customer, internal business process and learning and growth.

D. SWOT (Strength, Weakness, Opportunity, Threat)

SWOT analysis is a method for compiling a list of attributes of the organization for management to define resource allocation and optimize performance [16]. SWOT analysis stands for internal strengths, weaknesses, and external opportunities and threats. SWOT analysis is usually used for strategic planning [17]. According to [18] SWOT is a beneficial analysis for objective and comprehensive business internal factor to avoid weakness such a threat and match strength with opportunity for optimize organizational goal and objective. Other researcher claim that SWOT is an method for extract opportunity factor and threat in external environment and internal strength and weakness factor towards implementation of efficient action [19]. SWOT analysis can be inferred as an approach for define organization strategy by assessing organization environment focus on internal strength and weakness and external opportunities and threat.

E. Risk Analysis and Gap Analysis

Birch and McEvoy explain that structure risk analysis are association of threat, vulnerability, countermeasure, risk and attack that prescriptive to business value in organization [20]. Other researcher claim that risk analysis is technique for supporting development to determine priority and activity during development [21]. Reference [22] said that risk analysis examine all risk factor in organization as they emerge and analysis before. Risk analysis can be derived as problem that hasn't happen but can cause some loss and obstruct the successful of IT implementation [23]. According to some argument risk analysis can be explain as an analysis of threat, vulnerability, countermeasure, risk and attack that would be happen and define the strategic solution for resolve the problem.

Gap analysis is approach that used for creating and developing ability or measurement and ensure aligning business objective and strategy with IS/IT measurement objective [24]. Reference [16] explains that gap analysis define attribute into four variable axis quadrant there is cost, procurement, development item, rapid procurement. Gap analysis can be claim as an approach that align business objective and IS/IT objective in order to define strategy.

F. Five Force and Value Chain Analysis

Five force porter is model that used to help manager to choose the suitable strategy for market environment according to the organization strength [25]. Reference [26] claims that five force analysis is competitive force analysis in development organizational strategy to reach competitive advantage. Five force analysis consider for determine organization competitive intensity in order to reach profitability by assessing opportunity and risk.

Value chain analysis is used for creating product or service to get the best marginal and value added for customer [16]. Value chain also concentrated on the action taken to add value for organization, ordering and receiving revenue and financial for aggregate cost of performing business [27]. Other researcher explain that value chain can identify key value added process for more effective process [28]. Value chain analysis as approach to identify value added organizational activities from core business process which is used for define organization strategy.

II. PREVIOUS STUDY OF STRATEGIC METHOD

A. Balanced Scorecard Method

The researcher define four stage of define the strategy using balanced scorecard method, there are clarifying and translate list of strategy in organization, communicate and linking learning as organizational objective and performance measurement. According to [9], the balanced scorecard method has some strength like managing intangible asset, can drop down organizational strategy into activities for each person, do measurement of critical important goals in real time and create daily management for business activities. Some of the weakness are, measurement only seen in operational perspective, good scorecard will confirm overall business strategy, difficult to integrated into plan, budget and resource allocation, stakeholders just interest on financial perspective that can made strategy focus only in financial perspective [9].

World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:8, No:10, 2014

B. Balanced Scorecard

Reference [8] states that four stage of development strategy are identify mission, vision, and value, define strategic goals, identify strategic analysis and define strategic formulation.

C. Balanced Scorecard as Foundation for Strategic Management of IS

This research drive balanced scorecard as a strategic methods which is have four stage of activities, there are business value for defining cost control, risk and revenue. User orientation is used to identify preferred application and operation, establish and maintaining relationship of user community, satisfying user need. Future readiness is identify IS specialist capabilities, application portfolio, research into emerging technologies. Internal process are planning and prioritizing IS project, development of new IT application, operation and maintenance current IT application [29]. This method are allows manager to see the positive or negative impact of IS/IT activities on organization, ca evaluate IS/IT based on activities efficiency and effectiveness of organization product while the weakness are need support and commitment from all stakeholder in organization.

D. Balanced Scorecard in Aligning Strategy Implementation according to IT Development in Organization

This methods drive some step of activities in each balanced scorecard perspective, there are financial are used for identify cost reduction, define outcome goal by making productive IT product, align IT strategy with organization strategy. Customer is defining basic competency level of IT service, reliabilities and price; identify value adding contribution level in each business unit. Process defines operational excellence, identify partnership of development and support in each unit and strategic support for business unit. Learning and growth is for clarify core skill needed for IT unit personnel, aligning with operational excellence goal, business partnership and solution, create new customer culture.

The strength of this method in this research are increasing IS maturity as an effect of financial, growth and learning objective, make IT balanced scorecard more visible, enhance decision making for reached strategic goals. Otherwise the weakness are loss development system if the organization only focus in one perspective, low maturity usually focus in technical and network support function of IS [13].

E. Balanced Scorecard Based Management Information System

This methods of balanced scorecard drive three level that can be explain as define government mission, identify strategy objective, developing strategy map including management and development are used for planning, create new organization culture, leadership support, employee motivation and training. Business Process is development and implementation of standard rule, procedure and technology. Service and user is to define public service consumer citizen and business expectation, requirement, actuality and accessibility of administrative service. Transparency and dialogue among stakeholder is to clarify activities and process in state administrative.

In this research the researcher define some of strength, there are this methods can be implement in any government or public administration organization, enhance modernization of state administration information system and can be integrated while the weakness are for combining and integrating two system concept used to made strategic map using balanced scorecard that represent both of system [10]

F. Balanced Scorecard for ERP

In this research combine two strategic approach balanced scorecard and Delone Mclean, can be explain as financial to indicate contribution of ER in financial perspective. Customer for identify customer satisfaction degree. Internal business process is used for defining effectiveness activity and key process. Innovation and learning for define organization development and employee growth goals, identify system quality, identify information quality, define system use, identify user satisfaction, and identify individual impact and organizational impact. The strength of this method are can define the positive and negative impact of ERP implementation, define effective strategy and manage all execution activities of ERP [14].

G. Balanced Scorecard for Knowledge Management

This method linking relation between business process and knowledge management process, there are financial result in strategic management become budget and cost, customer satisfaction in strategic management become customer relationship management, business process in strategic management business process improvement, learning and growth in strategic management become knowledge management. The strength of balanced scorecard metric can explain and demonstrated knowledge management value for organization and knowledge capital [15].

H. Balanced Scorecard as Knowledge Management Tool

In this research balanced scorecard divided into four perspective, economic and social for define profit, creative and subsidiaries. Commercial and customer for identify market, new partnership and new service. Internal process defines innovation, learning, adapt process development performance. Organizational learning defines employee motivation, competencies and training. The strength of this method are can articulate strategic and operation management, as a center of knowledge aspect and monitoring creating knowledge and financial performance activities [11].

I. Balanced Scorecard to Facilitate Strategic Management

Stage of activities in this method explains as clarifying and translating vision, strategy appropriate in BSC method. Communicating and linking BSC as a tool for cascade organization goals and objectives. Planning and target setting align of organization plan and resource to reach organization goals and feedback and learning, controlling and monitoring learning program for staff. The strength is balanced scorecard become supporting tools that contribute to define innovation

World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:8, No:10, 2014

and improvement of organizational development and competitive strength [12].

J. Developing IS Strategic Plan

This study conducted SWOT, BPA (business process analysis), balanced scorecard, internal and external analysis, gap analysis and Ward Peppard IS strategic plan as a method for developing IS strategic plan. SWOT analysis is used for identify business environment attribute (internal and external), business process analysis for present target and real achievement, balanced scorecard is used for mapping IT with organization strategy and goal, Internal and external analysis is for identify infrastructure and application category, gap analysis used for aligning related solution in each requirement and expected situation. This research define strength through the combining method that can define suitable solution according to the assessment and requirement, the weakness of this combine method is complexity of communication among user and IT division in order to assess and define the requirement [30].

K. Risk Analysis for IS

This research conducted risk analysis method that divide into some stage, list the vulnerability of system, assign probability of vulnerability being exploitation, identify risk from threat and vulnerability, and identify counter measure and interactive process that applied to reduce exploration. The strength of this method are complete and consistent, straight forward, able to cope all implementation of IS, cost effective and interactive process [20].

L. Strategic Information System Using Five Force

This research delivering five force Porter as a method for analysis strategic information system that consist of five perspective, there are competition between rival that used for changes the competition objectives so it make information system as a tool for reached technology, respond and financial as competitive goals. Customer mobility perspective is used for identify supply chain control, enhanced financial service and security. Bargaining power of supplier perspective define direct supplier service system and electronic entry order. Substitute product and service perspective are used for developing competitive advantage strategy system for organization and the last is new entrance to the industry drive a partnership solution and collaboration. The strength of this method are explain that the characteristic of Porter strategic is change competence design, locking customer and using information system as a boundaries that block other competitor to entry while the weakness is there is no strategy for respond supplier bargaining power and didn't describe market situation [25].

M. Adaptation of Porter Five Force Model into Risk Management

This research combine more than one approach for delivering strategy, there are risk management, five force porter, SWOT analysis, gap analysis and value chain analysis. According to [16] combining risk management and five force

approach consist of four perspective, there are internal organization that used for define enterprise function task sharing, personnel loads, assignment duration and cross training. Industry risk includes technology maturity, product support and developer. Information consist of identify software ability and function, backup, network security, infrastructure, communication recovery and safety. Influence perspective extends for external demands, senior leadership support and policy. This research strength can categorize risk, track trend of risk and integrating group opinion.

This research also explain about SWOT method that consist of strength perspective that use for identify expert, certified process and requirement. Weakness can identify budget, software using and product limitation. Opportunity are used for identify contract personal, development internal software and production the last threat is used to identify budget cut off, internal standard and loss of quality.

Gap analysis according to [16] are divided into four axis quadrant, there are cost, lengthy procurement, developmental item and rapid procurement. Value chain analysis divided core business activities are inbound logistic, operation, outbound logistic, marketing and sales and service. Supporting business activities are firm infrastructure, human resource management and procurement [16].

N. Strategies for Competitive Advantage Using Five Force and Mc Carthey's Four Marketing Mix Model

This research combine Mc Carthey's firm development market strategies by identifying target market for product and service with five force Porter. This model consist of for perspective, there are product strategy that used for define innovation, differentiate product, information access, value added product service and expansion into related product lines. Price can identify effective price, discrimination cost leadership, price lining and smart pricing. Promotion can extend information about experience or customer belief and revenue sharing marketing. Place can define faster delivery integration online, e-business and strategic alliances [26].

O. Risk Analysis for Prototyping Development

The researchers done the research using risk analysis which is consist of four stages activities, define risk in user, problem domain, software developer, environment, application. Specify consequences of social relation, resource, process problem and product defect. Assign priorities are used for negotiate compound rank and combine individual rank. Select resolution strategies for improve setting, develop and limit prototype. The strength of this method are identify communication between developer and user, describe technology development problem, evaluate timeline project otherwise the weakness are loss of user risk analysis, evaluate consequence, probability and security and make impact on business schedule [21].

P. Risk Assessment and Information System

The researcher used the method for assess risk in four perspective, outer context for identify factor that will give organization and member need. Inner context define organization characteristic of strategy, structure, reward

World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:8, No:10, 2014

system, management, human resource. Content are identify proposed change, technology size and extensive project. Process identifies how things are done and issue perceive. Outcomes describe plan and unanticipated desirable [22].

Q. Risk Factor in Enterprise

Summer explain that risk factor can be analysis in six perspective there are organization fit that describe variety factor of organizational environment, skill mix indentify lack of expertise, specific knowledge and experience. Management structure and strategy define lack of commitment, agreement, goal and leadership. Software system development are use for define missed requirement. User involvement and training are used for identify user commitment and communication conflict. Technology planning is for define lack of adequate technology expertise, infrastructure, complexity, newness. Project management is used for cost and time analysis and social commitment for human and organization. This method can identify individual responsible in managing rink factor and assign respond for each factor. Otherwise the weakness is lack of contribute factor in recruitment and retention IT professional with specific skill [23].

R. SWOT Study for Development Strategy

In this study [18] do the development strategy into four perspectives, internal strength to define quality, innovation, diversification and expression. Internal weakness for define lack of core competitive exchange in information and data effectively. External analysis identifies external opportunity of economic globalization government policies. External threat is for define competition and price market. The strengths are can define green and rural strategy, high pricing, join, and transformation strategy. The weakness is only in the macro perspective of analysis [18]

S. Knowledge Based SWOT Analysis

SWOT analysis for internal and external analysis in knowledge study, were combine with five management area analysis there are market, finance, production, people and environment. This method used for strategic planning in system and management area.

T. Strategic Approach Using SWOT Analysis

This study conduct in Korea, method divide into two perspective of SWOT methods, external opportunity and threat for IT environment, urban renewal project trend, client requirement. Internal strength and weakness used for define man power, territory, government investment and related technology. The limitation of this study is used for small project [17].

U. Value Chain Analysis for e-Learning

In this research will be explain about development method by combine value chain analysis with balanced scorecard which is for e-learning will be combine from balanced scorecard generic framework for industries (financial, internal process business, learning and innovation, customer) and education (student placement, learning process, behavior,

employee), academic value chain (creating knowledge, applying knowledge, learning curriculum, design and delivery, student learning), course development value chain (firm infrastructure, HRM, technology, firm infrastructure). This research found that value co-creation model for service are represent micro and macro environment in investor, service designer and provider, supporting system and target market to create value. Then the value chain for product life cycle are align with market orientation and organization value chain [27].

V. Development of Web IS Plan Using Value Chain Analysis

This study combine some approach in development web IS strategy, value chain analysis used for identify information system that can increase profit and value added activities. Identify critical success factor that inferred organization and management. Business system planning combines top down planning and bottom up implementation, focus in business process and data. Strategic system planning is used for analysis major functional area of business and data architecture. Strength of this method is support activities in core business process, organization and infrastructure, HR, administration, evaluation, planning and development processes [28].

W. IS and Technology Strategy for e-Retailers Using Value Chain Analysis

In this study experience, ecommerce capability, transform firm clock, behavior become the element of value chain analysis for improving performance of strategy. Key organizational and environmental factor can influences e-retail of IST strategy and value chain enabler to examine complementary between source activities [31].

III. METHODOLOGY

This research conducted into several stages bellow:

A. Discovering Literature and Previous Study

The author discovering literature and previous study related to the strategic development method in organization and information system.

B. Identify and Discuss the Literature Review and Previous Study

All of information system and organization strategic development are discussed and analyze in order to deep understanding and identifying each method used in every research.

C. Classify all Strategic Methods in Every Literature and Previous Study

In this stage the author classifying each method in every literature into some categorization. The method concept, definition, approach, stage of activities, perspective, strength and weakness were basic division of the categorization.

D. Make List of Method Categorization

Result of classifying process is divided in four categorizations; there are type of method, stage of activities, strength and weakness.

E. Explain Each Categories List

Each categorization of strategic development method, stage of activity, strength and weakness are explained clearly.

IV. RESULT ANALYSIS

Based on literature review and previous study the research result was discussed below:

A. Type of Strategic method

Result of classifying process for defining strategic method that usually used for developing information system strategy were show in Table I.

Table I show that 34.38% researcher used BSC for developing strategy, risk analysis and SWOT analysis as second method that selected by researcher, the next method are value chain, five force and gap analysis.

B. Stage of Activity in Strategic Method

Table II shows a list of each strategic method activity. Each of activity was define from every conducted research. Generally balanced scorecard have five stage of activity, five force, SWOT, gap analysis, and value chain analysis determine four stage of activity, otherwise risk analysis have seven stage of activity.

C. Strength of Strategic Method

The following Table III explains about some strength of each strategic method that used in research.

D. Weakness of Strategic Method

Some weakness of each method will be shown in the Table IV. Each method has specific weakness, but most of them have the same weakness that is communication among unit and IT division.

TABLE I
TYPE OF STRATEGIC METHOD

	Balanced Scorecard (BSC)	Five Force Porter	Value Chain	SWOT	Risk Analysis	Gap Analysis
Research	[8]-[15], [27], [29], [30]	[16], [25], [26]	[16], [27], [28], [31]	[8], [30], [16]-[19]	[16], [21]-[23], [30]	[16], [30]
Amount	11	3	4	6	6	2
Percentage (%)	34,38	9,38	12.5	18,75	18,75	6.25

TABLE II
STAGE OF ACTIVITY IN STRATEGIC METHOD

Method		Stage of Activity
Balanced Scorecard (BSC)	1	Determine and define vision, mission & strategy, value, goals (IS/IT) [8]- [15], [29]
	2	Determine and define financial objectives and goals [8]- [15], [29]
	3	Communicating & linking learning to determine customer requirement, relationship/partnership, satisfaction, value and competencies [9], [11]-[15], [29]
	4	Planning & develop business process for enhance innovation (skill, technology, application) and performance management [9]- [15], [29]
	5	Strategic feedback, improve learning, competencies and motivation (skill, technology, application) [8]- [15], [29]
Five Force Porter	1	Define product/service (IS) with competitive value [25], [26]
	2	Define product/service (IS) with competitive value [25], [26]
	3	Define product/service (IS) with competitive value [25], [26]
	4	Define product/service (IS) with competitive value [25], [26]
Value Chain	1	Identifying core organization business process and supporting process [16],[27], [28]
	2	Identifying core organization business process and supporting process [16],[27], [28]
	3	Define core product/service transformation for the best marginal value[16],[27], [28],[31]
	4	Determine each improvement and transformation activities of core and support business process for value added product/service[16], [27], [28], [31]
SWOT	1	Identify internal strength [16]-[19]
	2	Analysis internal weakness [16]-[19]
	3	Define external opportunity [16]-[19] q
	4	Determine external threat [16]-[19]
Risk Analysis	1	Determine internal organization [16], [22], [23]
	2	Identify outer context factor of organization to accommodate [22], [23]
	3	Make list and assign probability of vulnerability of system [20]
	4	Identify risk from threat and vulnerability [16], [20], [21]
	5	Determine specific consequences [16], [21]
	6	Define countermeasure/resolution [20]-[23]
	7	Identify process that applied [20], [22]-[23]
Gap Analysis	1	Identify existing condition (budget, schedule and performance) [16], [30]
	2	Determine disposed objective/goal in the future [16], [30]
	3	Determine disposed objective/goal in the future [16], [30]
	4	Aligning related solution in each requirement and expected situation [16], [30]

World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:8, No:10, 2014

TABLE III
STRENGTH OF STRATEGIC METHOD

Method	Strength
Balanced Scorecard (BSC)	Manage intangible asset [9], [15]
	Drop down strategy into activities[9], [11], [14]
	Measurement in real time [9]
	Create daily management for evaluation activities [9], [29]
	Define IS/IT activities impact to organization [14], [29]
	Increase IS maturity[13]
	Enhance financial and strategic goals[11], [13]
	Increase KM value in organization[11], [15]
	Enhance innovation and improvement [12]
Five Force Porter	Identify core competencies[25]
	Define strategy for customer lock [25]
	Determine IS for barrier [25]
Value Chain	Concentrated on the action that add value, revenue and financial [28], [31]
SWOT	Define strategic requirement of IS/IT [30]
	Strategic from environment perspective [17], [18]
Risk Analysis	Complete and consistent[16], [20], [21]
	Straight forward[16], [20]
	Able to cope all IS implementation[20], [21]
	Cost effective and iterative process[20]
	Identify tend of risk and categorization [16], [21], [23]
	Assign responsible of every risk solution [23]
Gap Analysis	Align organization strategy with IS/IT strategy [16], [30]

TABLE IV
WEAKNESS OF STRATEGIC METHOD

Method	Weakness
Balanced Scorecard (BSC)	Communication approach between unit and IT division [30]
	Difficult to integrated all perspective into a strategy [10], [13]
Five Force Porter	Loss of analysis market situation system and product [25]
	Lack of supplier bargaining power strategy [25]
Value Chain	Focus in business activities not strategic activities [28], [31]
SWOT	Macro perspective not specific [18]
	Communication approach between unit and IT division [30]
Risk Analysis	Lack of contribute factor of IT HRM [23]
	Focus in risk measurement[22]
	High effect of change in organizational business, information and technology[20], [21]
Gap Analysis	Communication approach between unit and IT division [30]

V. CONCLUSION

The author conducted research by analyze and discuss literature review and previous study in strategic method. This research determines four discussing problem, there are:

A. Type of Strategic Method

First topic is discussing about the type of strategic methods, in this research the author find six common strategic methods that usually used. Balanced scorecard [8]-[15], [27], [29], [30] five force Porter [16], [25], [26], value chain [16], [27], [28], [31], SWOT [8],[16]-[19], [30], risk analysis [16],[20]-[23], [30] and gap analysis [16], [30] are usually conducted as strategic method in information system. According to the research balanced scorecard believed as the most popular method, followed by SWOT and risk analysis. Other methods are rarely used for strategic method in information system.

B. Stage of Activity in Strategic Method

Stage of activity are step by step process that used for determine strategies in each method. From analysis and discussion in this research the author can determine that balanced scorecard conducted five stage of activity [8]-[15],

[29], five force porter [25], [26], SWOT analysis [16]-[19], gap analysis [16], [30], and value chain analysis[16], [27], [28], [31] conducted four stage of activity, the last is risk analysis conducted seven stage of activity [20]-[23].

C. Strength of Strategic Method

In this category, the author defines strength for each method. Balanced scorecard expresses as the best method which has many advantages and strength in manage intangible asset [9], [15], drop down strategy into activities [9], [11], [14], measurement in real time [9], create daily management for evaluation activities [9], [29], define IS/IT activities impact to organization [14], [29], increase IS maturity[13], enhance financial and strategic goals [11], [14], increase KM value in organization [11], [15], enhance innovation and improvement [12]. Risk analysis as follow also believed as good strategic method, some of the strength are complete and consistent [16], [20], [21], straight forward [16], [20], able to cope all IS implementation [20], [21], cost effective and iterative process [20], identify tend of risk and categorization [16], [21], [23], assign responsible of every risk solution [23]. Other method didn't have a lot of advantage and strength as the previous two methods, but they can be an alternate choice of strategic method.

D. Weakness of Strategic Method

The author determine each weakness of strategic method as follow, balanced scorecard have a weakness in communication approach between unit and IT division [30], difficult to integrated all perspective into a strategy [13], [10]. Five force porter weaknesses identify as loss of analysis market situation system and product and lack of supplier bargaining power strategy [25]. Value chain analysis only focuses on business activities not strategic activities [28], [31]. SWOT analysis have macro perspective not specific [18] and difficulty in communication approach between unit and IT division [30]. Risk analysis weakness are lack of contribute factor of IT HRM [23], focus in risk measurement [22], high effect of change in organizational business, information and technology [20], [21]. Gap analysis weakness is communication approach between unit and IT division [30]. According to the research most of methods weaknesses identify as communication approach among unit as user and IT division [30]. The explanation and clarification of each strategic methods activities, strength and weakness can help organization and manager for choosing the best method to define strategic knowledge management system for organization as adaption methods from information system strategy. Modification and combination of strategic method are possible to enhanced method performance and objective.

World Academy of Science, Engineering and Technology
International Journal of Industrial and Manufacturing Engineering
Vol:8, No:10, 2014

REFERENCES

[1] I. Bercerra-Fernandez and R. Sabherwal, Knowledge Management System and Process. United States of America: M.E. Sharp, Inc., 2010.

[2] M. Woodman and A. Zade, "Five Grounded Principles for Developing Knowledge Management Systems Knowledge for Business (K4B), London, UK," Electron. J. Knowl. Manag., vol. 10, no. 2, pp. 183–194, 2012.

[3] J. S. Edwards, D. Shaw, and P. M. Collier, "Knowledge Management," J. Knowl. Manag., vol. 9, no. 1, pp. 113–125, 2005.

[4] R. Young, Knowledge Management. Japan: Asian Productivity Organization, 2013.

[5] M. A. Jhon and D. E. Leidner, "Review: Knowledge Management and Knowledge Management System: Conceptual Foundations and Research Issues," MIS Quartely, vol. 25, no. 1, pp. 107–136, 2001.

[6] J. Hahn, "A Framework of Knowledge Management Systems: Issues and Challenges for Theory and Practice *," in 21st International Conference on Information Systems, no. December 2000.

[7] F. Nickols, "Definitions & Meanings." Distance Consulting LLC, pp. 2–10, 2012.

[8] B. R. S. Kaplan, D. P. Norton, and A. B. Jr, "Strategy Developing the Strategy: Vision, Value Gaps , and Analysis." Harvard University, pp. 1–7, 2008.

[9] M. Išoraitė, "The Balanced Scorecard Method: from Theory to Practice," Intelect. Econ., vol. 8011, no. 1, pp. 18–28, 2008.

[10] I. Gueorguiev, S. Dimitrova, M. Komitska, and H. Traykov, "Balanced Scorecard Based Management Information System – A Potential for Public Monitoring and Good Governance Advancement," Electron. J. e-Government Vol. 3. Issue 1, vol. 3, no. 1, pp. 29–38, 2005.

[11] G. Wegmann, "The Balanced Scorecard as a Knowledge Management Tool : a French Experience in a Semi-Public Insurance Company," ICAI J. Knowl. Manag., vol. 6, no. 3, pp. 1–19, 2008.

[12] H. Pienaar and C. Penzhorn, "Using the Balanced Scorecard to Facilitate Strategic Management at an Academic Information Service," Libri, vol. 50, pp. 202–209, 2000.

[13] M. A. Ardakan, Z. Barzegar, and Z. Vahdat, "Using Balance Score Card in Aligning Strategy Implementation According to Information Technology Development in Organization," in 3rd International Conference on Information and Financial Engineering IPEDR Vol. 12, 2011, vol. 12, pp. 348–352.

[14] H. Lin, P.-Y. Hsu, and P.-H. Ting, "ERP Systems Success: An Integration of IS Success Model and Balanced Scorecard," J. Res. Pract. Inf. Technol., vol. 38, no. 3, pp. 215–228, 2006.

[15] A. M. Fairchild, "Knowledge Management Metrics via a Balanced Scorecard Methodology," in Proceeding of the 35th Hawaii International Conference on System Sciences, 2002, vol. 00, no. c, pp. 1–8.

[16] J. F. Rice, "Adaption of Porter's Five Forces Model to Risk Management," Alabama, 2010.

[17] G. Houben, K. Lenie, and K. Vanhoof, "A knowledge-based SWOT-Analysis System as an Instrument for Strategic Planning in Small and Medium Sized Enterprises," Decis. Support Syst. Eselvier, vol. 26, no. 2, pp. 125–135, Aug. 1999.

[18] X. Chan, "A SWOT Study of the Development Strategy of Haier Group as One of the Most Successful Chinese Enterprises," Int. J. Bus. Soc. Sci., vol. 2, no. 11, pp. 147–153, 2011.

[19] D. Kim, B. Ahn, J. Kim, and J. Kim, "The Strategic Approach Using SWOT Analysis to Develop an Intelligent Program Management Information System (IPMIS) for Urban Renewal Projects," in Fourth International Conference on Computer Sciences and Convergence Information Technology, 2009, pp. 320–324.

[20] D. G. W. Birch and N. McEvoy, "Risk Analysis for Information Systems," J. Inf. Technol., vol. 7, pp. 44–53, 1992.

[21] R. L. Baskerville and J. Stage, "Controlling Prototype Development through Analysis *," MIS Quarte, vol. 20, no. 4, pp. 481–504, 2009.

[22] L. Willcocks and H. Margetts, "Risk Assessment and Information System," in Proceeding of the First European Conference on Information System, ECIS, 1993.

[23] M. Sumner, "Risk Factors in Enterprise-Wide / ERP Pojects," J. Inf. Technol., vol. 15, pp. 317–327, 2000.

[24] V. Basili, F. Cese, M. Lindvall, M. Regardie, C. Seaman, J. Heidrich, F. Iese, D. Rombach, and A. Trendowicz, "Bridging the Gap between Business Strategy and Software Development," in Twenty Eight International Conference on Information Systems, 2007, pp. 1–16.

[25] D. Avison, A. Eardley, and P. Powell, "How Strategic are Strategic Information Systems?," Aust. J. Inf. Syst., vol. 4, no. 1, pp. 11–20, 1996.

[26] N. Shin, "Strategies for Competitive Advantage in Electronic Commerce," J. Electron. Commer. Res., vol. 2, no. 4, pp. 164–171, 2001.

[27] B. Lauridsen, "Shifting the Paradigm: Value-Chain Analysis Applied to Online Learning," in TCCC Technology, Colleges and Community Worldwide Online Conference, 2011, pp. 100–112.

[28] S. Pant, H. Taek, and C. Hsu, "A Framework for Developing Web Information Systems Plans: Illustration with Samsung Heavy Industries Co ., Ltd .," Inf. Manag., vol. 38, no. 6, pp. 385–408, 2001.

[29] M. Martinsons, R. Davison, and D. Tse, "The Balanced Scorecard: a Foundation for the Strategic Management of Information Systems," Decis. Support Syst. Eselvier, vol. 25, pp. 71–88, 1999.

[30] Angelina and Harisno, "Developing Information System Strategic Planning in the Directorate General of Animal Husbandry and Health , Ministry of Agriculture," in Procedia Engineering, 2012, vol. 50, pp. 29–37.

[31] J. Y. Tsai, T. S. Raghu, and B. B. M. Shao, "Information Systems and Technology Sourcing Strategies of e-Retailers for Value Chain Enablement," J. Oper. Manag., vol. 31, no. 6, pp. 345–362, 2013.

Elin Cahyaningsih received her B.Sc. in Information System (Gunadarma University, Indonesia, 2004), and Magister Management Information System from Gunadarma University , Indonesia, 2007). She is now taking his Ph.D in Computer Science (University of Indonesia). He works as a civil servant in the National Civil Service Agency of Indonesia (Badan Kepegawaian Negara). Her research interest includes Information System and Knowledge Management.

Dana I. Sensuse received his B.Sc. in Soil Science (Bogor Agricultural University, Indonesia, 1985), M.LIS from Dalhousie University (Canada, 1994), and Ph.D. in Information Studies from University of Toronto (Canada, 2004). Now he works as a teaching staff in Faculty of Computer Science, University of Indonesia, and Head of e-Government Laboratory. His research interests include E-Government, Knowledge Management, and Information Systems.

Wahyu C. Wibowo received his B.Sc. in Informatics Techniques (Bandung Institute of Technology, Indonesia, 1987), M.Sc. in Computer Science from Indiana University (Bloomington, IN, USA), and Ph.D. from RMIT University (Melbourne, Australia). Now he works as a teaching staff in Faculty of Computer Science, University of Indonesia, and Head of Information System Development Division in the Directorate of Information System Service and Development (PPSI). His research interests include Knowledge Representation and Processing, Knowledge Extraction and Spatial Database.

Sofiyanti Indriasari received her B.Sc. in Computer Science (Bogor Agricultural University, Indonesia in 2007), and Magister of Computer Science from University of Indonesia in 2014. Her research interest includes Knowledge Management and Information Systems.