DEVELOPMENT OF INFORMATION TECHNOLOGY STRATEGIC PLANNING FOR MANUFACTURING INDUSTRY (CASE STUDY: PT MCM)

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Abstract: IT Department in PT MCM has to carry out the duties and functions of developing solution to support the business unit in their operation and gain some benefits which should be obtained by using IT in manufacturing such as increasing efficiency, improving the effectivity in making decision and helping to promote the products. This study aims to design information technology strategic planning in accordance with the strategic plan. The research method is using the IT Strategic Planning framework of Alex Cullen and Marc Cecere. This study uses SWOT and IT Balanced Scorecard to analyze the needs of IT at PT MCM. The results of this study are recommended strategic steps to optimize the implementation of IT in the company to improve the performance from IT division to obtain the benefits by implementing IT in manufacturing and to form IT Blueprint, which is part of the information technology strategic plan in PT MCM.

Keywords: Strategic Planning; IT Blueprint; IT Balanced Score card

INTRODUCTION

The world of manufacturing has reached a turning point because of the influence and impact of information technology (IT). Manufacturers must compete in the global market to be successful today. That competition consists of combining technological advances with strategic management insight to reach company's goals and potential. Management in manufacturing company is aware of the needs of reducing cost, automating tasks, controlling inventory and products by means of benefits of deployment IT. Company has to move quickly to compete because with information technology, it takes only days to gain or lose a competitive advantage [1].

PT MCM is a cotton manufacturing company with main products of cotton buds, cotton ball, facial cotton, cotton sliver and bleached cotton. The company sells their products in the local market and overseas. The company utilizes two database applications to cover their operational such as making purchase order and to compute their production. The company top management believes that these applications were not sufficient to cover management and company strategies needs. PT MCM has so many issues in relation with the company IT infrastructure. All of those problems and company strategy to improve business are described in their management review document. With all of the problems and business needs described in management review

document, process to aligning IT with business will be done. In this case, PT MCM will develop IT strategic planning to aligning IT with business needs and strategy. The output from IT strategic planning is an IT Blueprint which can be used as guidelines in supporting company's strategy and business. Based on all of those reasons, we will discuss how to solve the problems in PT MCM based on management review 2013, what kind of information technology in the future for PT MCM and how to determine IT policy in the future which suits with PT MCM policies and strategies.

Management Review 2013 in PT MCM described that email services were down frequently and that made approach to customer using email was delayed. The company will take ISO 9001:2008 certification but no preparation in managing IT / IS in company, data leakage because no access restriction in opening, modifying and distributing shared data between user, slow internet access because of network problems which made all market research being delayed, in needs of a website as a place to introduce the products and increase sales growth, in needs to access factories data easily as fundamental data to made agreement with customers, top management and all of division head are having difficulties in making decision because the basic data are difficult to process.

This study is focuses on how to develop IT Strategic Planning to help PT MCM solving their problems. The limitations in this study are: focused on GAP analysis by comparing IT state today with IT in the future, data that will be used are gained from PT MCM and not compared with others manufacturing companies, strategic planning will only consist of data from 2013 to 2015 and not described how to develop contingency planning and disaster recovery.

The goals in this study are to analyze critical factors that can be used to develop IT strategic planning in manufacturing industry to produce a strategic planning as IT Blueprint in the future for PT MCM and to recommend strategic steps in form of IT Strategic planning to help PT MCM in production efficiency, analyze effectiveness in production and grow sales.

Benefits that will be gained from this study are helping IT division head in PT MCM in making master plan of IT development that suits companies businesses.

METHOD

IT strategic planning in MCM was developed using a framework [2]. With this framework, IT strategic development will be done by five steps (fig. 1.):

Step 1: Define your plan's purpose; in this step, identify the company (vision, mission, and its state), purpose, scope and stakeholder of strategic planning. After that, distribute it by using summary for top management and board of director from the company.

Step 2: Capture and evaluate business needs; in this step, identify the source of business needs, gather and information and analyze it using SWOT analysis [3]

Step 3: Assess IT's ability to support needs; in this step, do some assessment in IT Division (structure, process and state). After the assessment was completed, develop what kind of IT will be in the future and identify the gaps using evaluation of IT function [4].

Step 4: Develop your plan to close the gaps; in this step, develop strategic IT principles, mapping those strategies into IT Balanced Scorecard, identify gap closing and describe IT for company in the future

Step5: Finalize the strategic plan and roll it out; in this step, finalize the strategic plan by explain it to Board of Director and approve it, make implementation plan and budgeting, after that, make the KPI [5] as a tool to measure the success rate from implementation of IT strategic planning.
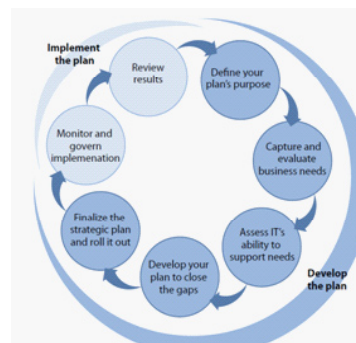

Fig. 1: IT Strategic Planning framework

RESULTS AND DISCUSSION

In first step we define our plan's purpose. Our vision is to become a big cotton manufacturing company. Our mission are improvement in product's quality and quantity, innovation in products and expand market area. Our purpose is to develop IT Blueprint which solve issues in company. Our scope is management review 2013. The stakeholder are board of director, top management, IT head, QMR ISO and all of division head.

In second step, we capture and evaluate business needs. Starting with defining SWOT analysis:

Table 1: SWOT matrix

	Strength (S) :	Weakness (W) :
	1. Solid IT division team 2. Support from top management in IT development 3. Good communication between division 4. Continuous Innovation	1. Inconsistent SOP 2. Deficient IT infrastructure 3. Less control in IT development 4. IT implementation is not optimal
Opportunity(O): 1. Fast growth in IT which yield benefits if used optimally 2. Huge market	SO Strategy : 1. New IT implementation to supply business needs 2. Develop IT Blueprint	WO Strategy : 1. New IT staff which have quality and suit company well 2. Repair and optimizing IT infrastructure 3. Repair and optimizing IT implementation 4. Standardize SOP 5. Develop IT Blueprint
Threat (T) : 1. Unpredictable disaster 2. Attacks from outside using IT 3. New competitor	ST Strategy : 1. IT implementation which suit business 2. Increase easiness in using IT 3. Scheduled IT activities	WT Strategy : 1. Good socialization in implementing IT 2. Dynamic workflow in IT development 3. IT standard renewal

From SWOT analysis, PT MCM is on third quadrant (WO Quadrant) which means it has a huge market opportunity but it need to consolidate, doing improvement and eliminate the problems to gain more market and stay away from threats. The best strategy for PT MCM is turn-around strategy [3].

Information obtained from division head about business needs are issues in IT infrastructure, in need of managing IT/IS with documentation, in need of new database application, in need of tool to analyze data and in need of a website

In the third step, we assess IT's ability to support needs. IT staff in PT MCM (fig. 3) consisted of 1 Head division, 1 vice head division, 1 analyst, 3 programmer, 1 administration, 1 tech support and 1 maintenance staff.
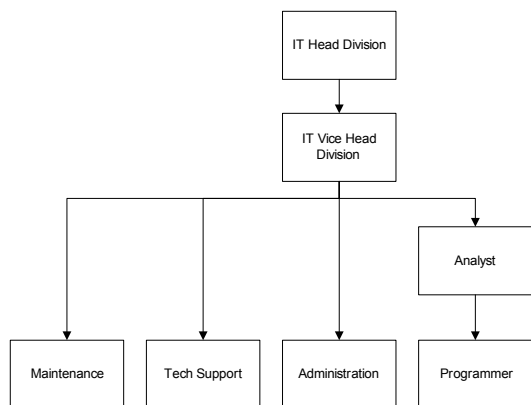

Fig. 2: IT Organizational Structure in PT MCM

IT function evaluation [4] at PT MCM described on table 2. From that evaluation, we found the gaps between expectation and performance from IT division. The gaps can be seen on fig 4.

Table 2: IT Function Evaluation

| No	Attribute	Expect	Perform	GAP
11	System response time	3.55	2.73	-0.82
4	Out of system database access	3.45	1.00	-2.45
10	Data security and privacy	3.45	1.91	-1.54
15	System flexibility to produce	3.45	1.82	-1.63
1	professional reports	3.36	2.18	-1.18
6	User simplicity to access facility	3.36	2.27	-1.09
7	System supporting staff with good	3.36	1.55	-1.81
14	technical competency	3.36	1.18	-2.18
16	System credibility	3.36	3.36	0.00
2	User participation in system	3.27	3.00	-0.27
19	requirement planning	3.27	1.27	-2.00
8	Positive attitude from IS staff to	3.18	2.45	-0.73
13	user	3.18	2.09	-1.09
17	Up to date hardware	3.18	3.18	0.00
21	System's ability to improve	3.18	1.64	-1.54
9	personal productivity	3.09	1.73	-1.36
12	User level control in system	2.64	1.27	-1.37
3	Fast response from support staff to	2.36	1.91	-0.45
5	solving problems	2.36	1.82	-0.54
20	Understandable system	2.27	3.55	1.28
18	Documents to support training	2.18	2.45	0.27
	System response for changing needs of user			
	User training			
	Up to date software			
	Low downtime of hardware and software			
	Standardize hardware			
	Cost effectively from the whole IS			
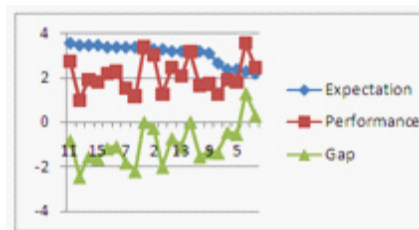
Fig. 3: Snake Diagram

In the fourth step, we develop our plan to close the gaps. From analysis and evaluation, IT division at PT MCM needs to do some improvement to support company. To do that, they will implement new software development framework by doing development which assumed it will be repetitive, all of the requisites will be regulated, make things that can be used repeatedly, visualized modeling to describe development plan, verified IT implementation and always controlling all needed changes in implementing IT in company [6].

IT Balanced Scorecard Evaluation can be seen on Table 3.

Table 3: IT Balanced Scorecard Evaluation

Perspective	Result
Institutive contribution	70 %
User orientation	56.67 %
Operational improvement	58.47 %
Future orientation	39.37 %
Average	**56.13 %**

From IT Balanced Scorecard evaluation concluded IT division performance was on very poor category. They must improve their performance.

To solve the problem in IT infrastructure we will recruit one IT infrastructure staff with qualifications as follow: He/ She is able to configure TCP/IP configuration, overcome Ms Windows Server 2003, overcome mail server configuration, overcome user directory configuration, can handle network trouble shooting, has knowledge in mikrotik, overcome security system by using firewall and proxy server and will be trained minimum three times in a year, split all of running IT services into 7 server (main server, database application server, digital data bank server, proxy server, mail server, backup server and factory server) with specification : Dell PowerEdge R710 (Intel Xeon E5645 2.4Ghz, Dual Port Gigabit Lan with TOE, Perc H700 Adapter Raid Controller, 3x300GB SAS Hotplug, 8GB (2x4GB) 1333Mhz Dual Ranked RDIMMs, No K/B + Mouse, No Monitor, DVDRW, DOS, Rackmount 2U) which each server HDD will be mirrored using RAID technology, using same version for Microsoft office (Microsoft office 2007) and develop contingency plan and disaster recovery schema to anticipate disaster.

To solve IT/IS management to fulfill ISO 9001:2008 requirement we will make server maintenance checklist and schedule, make backup data checklist and schedule, make user computer maintenance checklist and schedule, develop database application to store IT asset management data.

To solve data leakage, we will store all shared data in new digital data bank server and restricted all user access

To solve in needs a website, we will recruit one web developer staff with qualifications : he/ she is able to overcome PHP, mysql, adobe photoshop CS3, java script and J-Query and will be trained minimum three times in a year and develop a dynamic web to distribute information about company and products using internet.

To solve in needs easy access to factory's data, we will build interconnection between head office and factory using LogMeIn Hamachi software.

To solve in needs database application to cover all business process, we will develop a web application with dynamic workflow [7] to help top management in monitoring IT project development, develop a helpdesk desktop application, develop a web application to cover human resources data and processes, develop a desktop application to cover purchasing division data and processes, develop a desktop application to cover production division data and processes, develop a desktop application to cover marketing division data and processes, develop a desktop application to cover finance division data and processes, recruit one staff data analyst with qualifications : he/she is able to overcome data warehousing, Ms SQL Server, has financial knowledge, can read accounting report and is a problem solver, develops a desktop application to cover accounting division data and processes, recruit one dashboard application specialist with qualifications: he/she is able to overcome crystal xcelsius, Ms SQL server and T-SQL, develops dashboard application as reporting services

The last step is finalizing the strategic plan and roll it out. In this step, implementation plan and budgeting is made based on gap closing and then the data to Board of director is presented and finalized in form of IT master plan. After that, KPI is build as a tools to evaluate success rate in implementing the IT Blueprint.

CONCLUSION

From this study, we can conclude that with SWOT, we know PT MCM was in WO quadrant which means the best strategy for PT MCM is turn-around strategy, with IT Balanced Scorecard, we know performance from IT division is on very poor category which means they have to make improvement in supporting company.

From all analysis and evaluation, IT Blueprint has been made to help PT MCM solve their problems with milestone as time frame and KPI to evaluate the success rate.

This study has some limitations such as three years only and focused on infrastructure, SDM and application improvement. In the future, it can be developed further more by maximized IT function in company, mobile application, and e-commerce to help company in improving their business.

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