

AGILE DEVELOPMENT APPLICATION OF INFORMATION SYSTEMS / INFORMATION TECHNOLOGY STRATEGIC PLANNING IN PT.GMS

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ABSTRACT

In entering the business competition lately, especially in restaurant industry can't be separated from the role of information technology / information systems. In an information systems development there is two method that can be used , that waterfall and agile development. In this opportunity we believe that systems development with agile development method will bring more success for an information systems development project. This method was chosen because we undertook information system strategic planning in a company which is a family business. System information with agile development that aligns with corporate strategic planning should have always controlled, and where there is crafting strategy then move quickly the information systems development is expected to adapt.

Keywords - Information Systems, Technology Information, Agile Development, family business.

INTRODCUTION

In a study conducted by David and Lenny (2007) in a family firm Ny.Meneer explained that the family business model should have strategy that intersecting (Figure 1). The strength of this business model that can be delivered into company's business strategy [27].

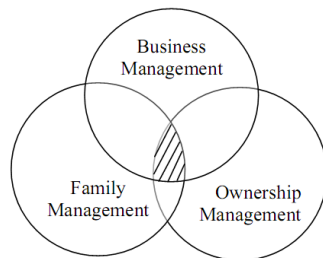


Figure 1. Family Business Success Model

According to Ward, J., Carlock, RS (2001) strategic business planning in a family business needs to be procees with a mapping of business opportunities and the business direction with the

family needs combine with point of view of family management (Figure 2) [26].

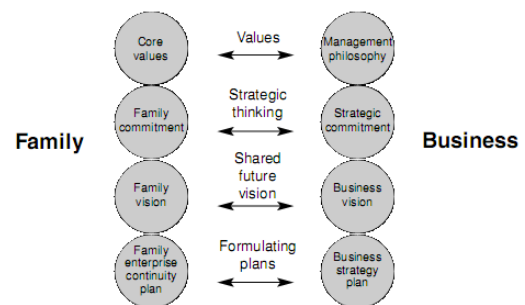


Figure 2. Parallel Process Planning

Meanwhile, in a study by Xiang, L (2009) in a family business in china, it was found that the management of the family business itself in a globalized world must have evolved in terms of management structure. Changes in upper-level management structure should be done in order to

develop human resources organization, culture, and business network, so the family members inside the organization can be more focus on the strategic direction of the business without to much involved in the operations activities of the company [12].

Based on the three studies above, then anyone involved in the management of the company, both sides of the family members or professionals should be able to formulate a strategy that can be defined in several alternative proposals that fit into business strategy that match with the vision, plan and in accordance with the family needs[26].

According to Ward and Peppard (2002), business strategy then should can be interpreted into the following steps :

1. *Vision* , is a thing that want to achieve in the future to apply the business strategy.
2. *Mision*, is a direction or an organization statement that has a value.
3. *Business Driver*, is a set of values that considered important in a response to changes or business growth within the organization.
4. *Objective*, is a target that want to be achived by every aspects of the organization to realize the vision.
5. *Strategy*, are the steps taken in achieving objectives.
6. *CSF* , is the crystallization of business objectives and strategy.
7. *Business Area Plan* is a plan or work programs of every business area within the organization [25].

The growth of business organizations today can't be separated from the role of information technology. Then in this occasion authors use Ward, Peppard (2002) approach steps model in order to make IS / IT strategic planning(Figure 3).

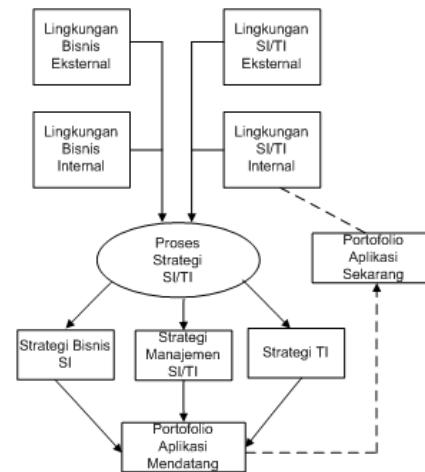


Figure 3. IS/IT Strategic Planning Model

In this opportunity IS / IT strategic planning conducted on organizations that engaged in the restaurant industry. According to Prasad,M.,Scornavacca,E.,Lehmann,H. (2005) the development of information systems / information technology in the restaurant industry trends over time more aimed to efficiency of product presentation, administration work efficiency, easy use to control of raw materials, as well as for sales planning the next day. Where constraints level of labor adaption to the use of IT equipment and technical problems of the technology should also be considered also. So when the implementation time comes doesn't disturb the operational performance [1].

Then according Shimmura,T., Takenaka.T., Akamatsu,M. (2009) the development of information systems in restaurant , in addition to using the POS should also collaborated with PMS (Process Management System) to improve the speed of service , efficiency of material use, and time to presenting a menu to customer [2].

The user of Wireless POS in the restaurant business , according to Stanford,V.(2003) should be considered the obstacles will rise, such as : interface design , user adoption level, level of responsiveness between POS and the server. This kind of obstacles need to be considered seriously and analyzed in order to avoid business risks of failures that may occur when user failures or other technical failures at lunch



hour or at the time when restaurant is having increment numbers of visitors significantly[5].

In the development of information systems , according to Rand,C., Eckfeldt. (2004) in his study at 25 restaurant spread across the Manhattan city with the kitchen that centered at Long Island City, with vision to increasing the business value that align with the business strategic itself. The hope is reducing waste by 15%. Authors carrying out these information systems project use Agile XP (Extreme Programming) Development [4].

Good IS/IT strategic planning also need to be supported by good repository system of documentation in plan, development and management , dalam hal perencanaan, pengembangan dan manajemen, so that information systems development projects can be divided and well structured in EA dimensions [29].

So based on the literature and journals, the authors began doing research on the agile development application of information systems/information technology strategic planning in PT. GMS.

LITERATURE REVIEW

IS/ IT Strategic Planning

According to Ward and Peppard (2002) , IS / IT strategic planning in every organizations should begin with external business environment analysis with analytical tools like PEST, SWOT. The next step analysis of internal business environment analysis using SWOT, Balance Scorecard, business process analysis. The results of external and internal business environment analysis then combined with the external and internal IS / IT environment analysis . Analysis tools that used :

1. Analysis of the technology trends that have been used today in similar industries, both through the study of literature and direct observations to the field [3],[4],[5],[21].
2. Analysis of IT infrastructure and IS problems that happening today, so then can be conduct an analysis to give alternative solution for organization condition.
3. Analysis IT Balance Scorecard, when generate from Corporate BSC that already approved by management, Authors then convert it into IT BSC model [14],[25].

According Ward and Peppard (2002), the analysis results then will be combine into IT strategic process that can be deliver into this three activities [25]:

1. IS Business Strategy

IT Division do some problems identification that comes from business unit lately, gives the list of alternative solutions and the explanation, do some memberikan daftar alternatif solusi dan penjelasannya , do weighting for every alternative solution and align the results of BSC analysis , may provide cost estimation of alternative solutions.

2. IS / IT Management Strategy

IT Division define every changes like management structure changes, classification IT staff needs, Standard Operation Procedure, IS / IT security standard system, other rules that need to fulfill the organization objectives. SOP and this rules must made to support every activities of alternative solution planning that already suggested above.

3. IT Strategy

IT Division make suggestion of IT Infrastructure that needed. The suggestion must consist of technology standard solution for every alternative solution IS / IT, IT Infrastructure suggestion that support IS business strategy, application or information systems recommendation in the future that support every business strategy plan of business unit.

Those three activities above will produce future portfolio application and analysis gap of business strategy and IS / IT strategy. This two results is important to be documented and deliver to organization management, so can be decided the development of information systems that should be priority for interests of strategic steps of organization. Then we can deliver estimation of cost implementation and implementation timeline.

Agile Development Application

According to Rand,C., Eckfeldt. (2004) in doing aligning business strategy with IS / IT solution needs , then can be deliver with agile development approach to improve business value , so the impact

can be seen and perceived by management and users.

In good information systems development and can deliver a business value in restaurant industry, then need to conduct a measurement of benefits that perceived by business and the workers that use the technology. This things are explained in research that conduct by Prasad, M., Scornavacca, E., Lehmann, H. (2005) [1]. Even the successful of IS / IT solution usefulness in a restaurant business also determined by the adoption level and perceiveness by workers in restaurant, which mean that all the action and respon from workers in restaurant with the perceiveness of usefull of IT / IS utilities can affect into brand image of the restaurant in the eyes of customers. That's why it is so important to have a simulation and full trial of the usefulness of IT / IS utilities to review and revise the IS / IT development in the phase of agile development. This conclusion also supported by the research of usefulness of wireless POS in a bar, when there is conduct a simulation by the workers at night hour shift and the workers need to get familiar of using technology and must train himself with the usefulness of information systems in PDA, instead of a piece of paper [5].

The Structure of Research

Based on many literature and journals that we received, then authors deliver a structure of research to make an IS / IT strategic planning. With main reference are Ward and Peppard (2002) then we deliver the research structure as below (Figure 4).

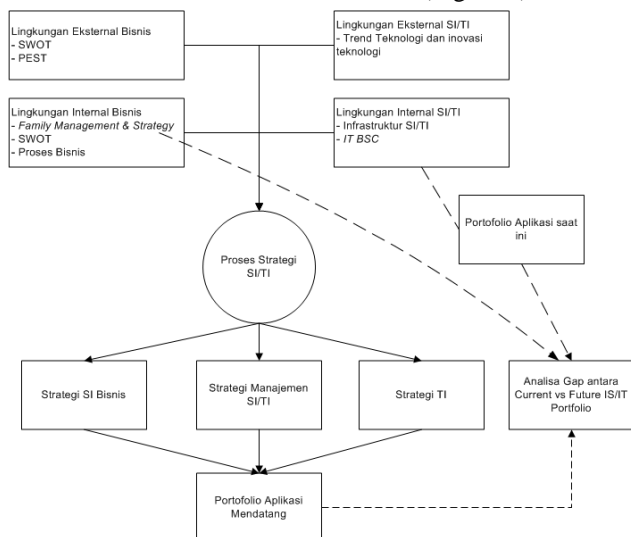


Figure 4. Structure of Research

In the process of research, authors develop some gap analysis between today portfolio applications and future portfolio applications. Which that this gap analysis deliver a list of IS alternative solution that write down base on the priority of solving the business problems that already decided the priority by organization management.

And to support the information system development phase that will be implemented in PT. GMS, which is the flexible changes of strategic can happen anytime and with anykind of changes so authors suggest a SDLC (System Development Life Cycle) with agile development. Authors believes this method will survive, because according to some literature and journals in information systems development at business restaurant, then agile xp development method that mostly suggested. So at PT. GMS authors will suggest agile xp development with some adjustmet of IT Divison structure, culture, performance and also the IT staf classification. SDLC that suggested to PT.GMS will be deliver into this steps (Figure 5):

1. Start

Is a condition that IS / IT project already approve even from the budget, project sturcture and project timeline that already have same goals and agreement with business unit..

Output : Project Charter, Project Structure, Project Timeline.

2. Business Requirement Phase

Is a phase where IT team together with users doing analysis through process workflow, report that want to produce from systems, problems that always occurred in daily activity of business as usual.

Output : Business Requirement Document, Use Case Diagram, Workflow Process Document.

3. Functional Spesification Design

Is a phase which IT team / vendor present the original design system at the begining project and compare with all the requirements that already mention in business requirements document, so that can achieved what's the gap and also anything that can be customized or improve.

Output : Gap Analysis Design, Custom Requirement Design

4. *Development Phase*

Is a phase where IT team / vendor do the systems development that already describes in custom requirements design document. In this phase also IT team / vendor must deliver clearly to users all the gap that found and documented in Gap Analysis Design document. Then users must proceeds with IT team / vendor to analyze and find out the other solution . In development phase users must take time to have trial and simulation step by step based on business scenario that will be in-touch with the systems. Proceeds from this phase will called SIT (System Integration Test).

Output : SIT Scenario.

5. *SIT(System Integration Test)*

Is a phase where users routinely in period of time doing testing with SIT scenario that describes business activity as usual, as reference for testing the application that already deliver by IT team/ vendor ,as a results usually found anykind of mistakes, difference of perception , eithers systems bugs.

Output : SIT Results & Sign Off.

6. *Change Request*

Is a phase where users can submit a list of changes that critical to business activity and can disrupt the BaU (*Business as Usual*). The approval of changes must be done by users and IT team.

Output : Change Request Document.

7. *Final Delivery*

Is a phase where application / information systems that developed already completed with the beginning requirements, change request. Final Delivery must based on all the SIT results approval by users and no more complaint or even any kind of bugs , problems that can disrupt the BaU. After this approval the phase can be proceed to UAT.

Output : Final Delivery Agreement.

8. *UAT(User Acceptance Test)*

Is a phase where users conduct a full test on the application or information system with final delivery version. The test must based on all the business activities process, so the implementation pahse can be proceed to the next step.

Output : UAT Results & Sign Off.

9. *End*

Is a phase to close the projects. This project can be close with some notes of course, if there is some issues that can be solved outside the systems temporary and not disrupt BAU. So those notes must write down in Final Delivery Agreement Document. Either IT team / vendor can do improvement after users make some change request outside the project implementation time line.

Output : Work Instruction , SOP.

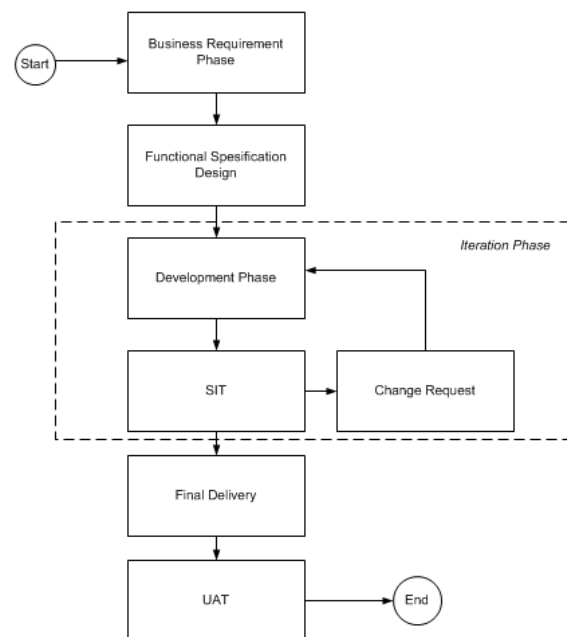


Figure 5. Agile XP Development in PT.GMS

RELATED RESEARCH AND FRAMEWORK

Business Needs Analysis (BSC) and IS / IT Portfolio

1. Business Process Analysis at PT. GMS

The first steps to understand the current business condition in PT. GMS, then authors do some observation in the field to get a big picture of business process workflow in restaurant. The major line of process business activity in restaurant PT. GMS can be divided into two business process :

a. Dine-In

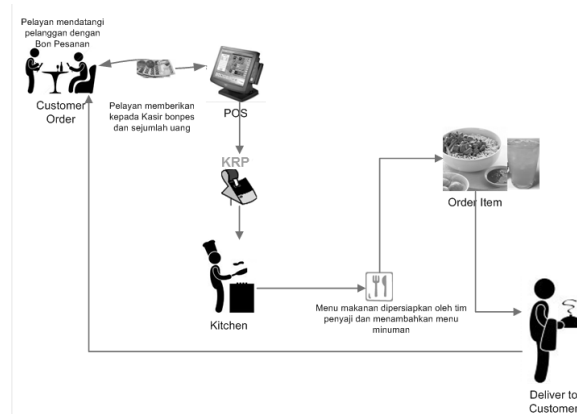


Figure 6. Dine-In Process

Workflow process of Dine-In can be describes like this :

1. Customers come to store then get served by waiters., waiters come with list of order menus, so that customers can choose the menu that they like. Then the waiters will be mentioned again and quickly calculated the total prices and asked the customers for the rupiah.
2. Then waiters come to cashier area for posting the order into POS. If there is any money change, then waiters back to customers with the money.
3. After the cashier posting the order into POS, then the results will be printed into KRP (*Kitchen Receipt Printer*) that located at kitchen. The head officer in the kitchen then will divide the menu based on type of menu, so the tasks can be deliver into boiling crew and cooking crew.

4. All crew in the kitchen do the menu process, cooking and boiling ,also noodle based on the order that already conducted by the head crew in the kitchen.
5. After all the food process done by the kitchen crew then the menu ready to served by the waiters, then the kitchen head crew served it well done and deliver the drinks also and give it to waiters..
6. Waiters then took the well done menu and served it to the customers with the bill menu put it on the table.

b. Take – Out / Delivery

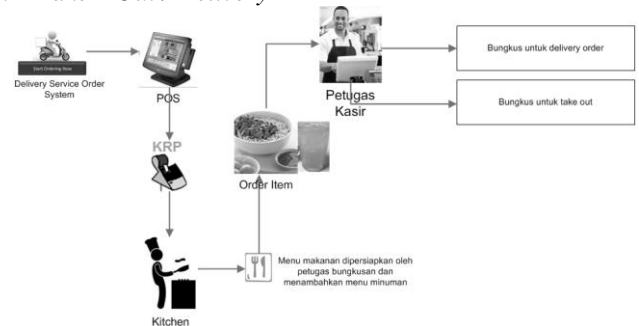


Figure 7. Take-Out / Delivery Process

Workflow process of Take – Out / Delivery describes as this :

1. Cashier crew received information from DSO systems or received take-out order in cashier desks, then cashier do posting into POS to get proceed into kitchen.
 2. The posting results get printed through KRP (*Kitchen Receipt Printer*) , then the task with delivery order or take-out can be divided by the kitchen head crew.
 3. The food process happening in the kitchen together with the drinks served.
 4. The order that already done for process then bring to crew in cashier to get wrapped up or give it to customers for take-out or delivery crew for delivery order. Cashier then update the delivery status in DSO system for update information in Call Center Department. So when customers call Call Center Hotline they can inform the time of food order depart.
2. **Strategic Map in PT.GMS**
- Strategic Planning in PT.GMS get started with the business analysis needs of the organization, so this research can continue to get the IS / IT strategic planning. This strategic map

results based on CSF analysis in PT.GMS (Figure 8).

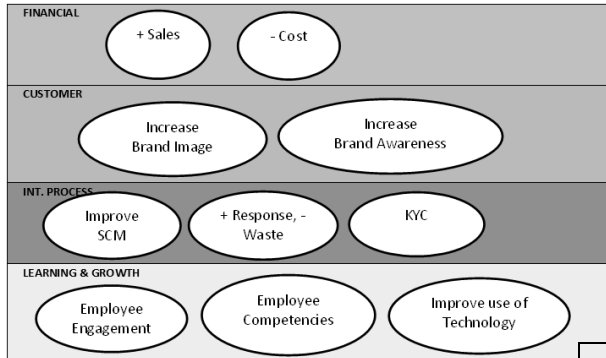


Figure 8. Strategic Map PT.GMS

3. PEST Analysis

According to the research methodology that already define before, then in this research conduct external factor analysis of PT. GMS that can affect into the business strategic steps of organization. So the next step is to conduct SWOT analysis with interview and group discussion. The interview with organization management based on the issues that founded in PEST analysis. So hopefully the SWOT analysis will be more comprehensive and align with the strategic map of PT.GMS.

4. SWOT Analysis

The next step is conduct an internal organization analysis (Strength & Weakness) , external organization analysis (Opportunity & Weakness). Then the analysis results can be mapped into EFAS and IFAS matrix so produce SWOT position diagram (Figure 7).

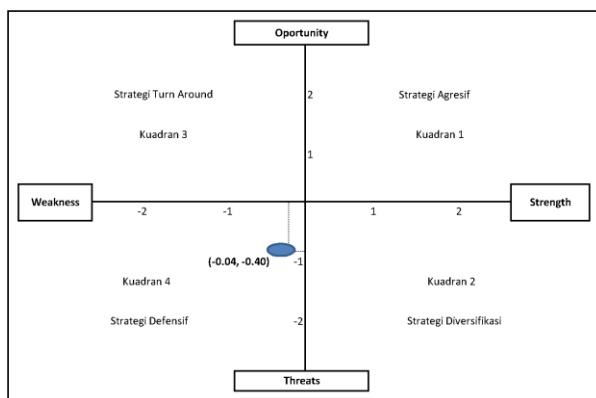


Figure 9. SWOT Position Diagram.

5. Analisis IT Balance Scorecard

After get the direction of strategy we choose based on the SWOT analysis, then the next step is to make align between business strategy and IT strategy. When aligning both of this strategy must be conducted with relationship diagram, so we can transform it into questionnaires . This questionnaires can be used to measures the IT division performance. The evaluation results and performance measurements of IT Division must based on BSC prespektif. Those prespektive are shown in table below..

Tabel 1. IT BSC Prespektive

Prespektive	Measurement
Institution Contribution	86.25 %
Users Orientation	73.64 %
Effeciency Operational	75.83 %
Future Orientation	90.67 %
Average	81.60 %

6. IS / IT Infrastructure Analysis

After knowing the position of IT Division performance, then the next step are doing the current IS / IT infrastructure analysis (Figure 10) and compare with the needs of infrastructure of IS alternative solution. So that authors can describes the recommendation of IS / IT Infrastructure for PT. GMS (Figure 11).

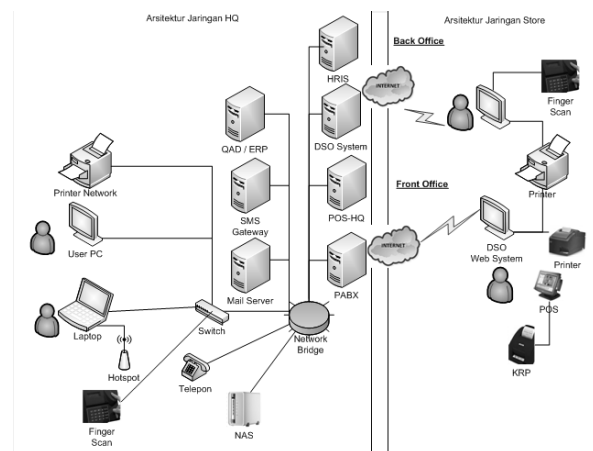


Figure 10. IT Infrastructure PT.GMS

IS / IT Strategy Process



1. Recommendation of IS / IT Strategy

Deliver the alternative solution based on the problems that founded and identified together with all division in PT. GMS. Problems that identified should have been through SWOT analysis process. Then those problems can be weighting with the alternative solution. Weighting will be measured by the priority of solving the problems, time estimation, and also cost implementation priority. This recommendation must be decided together with organization management.

Tabel 2. *Alternative Solution of Problems*

No	Masalah	Alternatif Solusi SI	
		Alternatif 1	Alternatif 2
1	Document , Information Sharing , Project timeline , Progress Report and other business process document need to be access by all authority for business process improvement project.	NAS	GMS Portal
2	Improve the speed of serving the customers	Kitchen Display System	Wireless POS
3	Material planning to reduce the food waste material until 10 %	Upgrade SPB	QAD (Material Requirements Planning)
4	Training module and standard guide system of organization should be easy to accessed	GMS Portal	Learning Management System
5	Lack of website utilization to communating brand image to customers	Update and Content Management for Website PT.GMS	Social Media activities
6	Lack of IT utilization for relationship media within	Add forum features at GMS portal	Community Website

	organization		
7	With a lot of workers at restaurant that doesn't get directly in-touch with e-mail, then the company announcement not Dengan banyaknya pekerja di restoran-restoran yang tidak bersentuhan langsung dengan e-mail, membuat informasi dan kebijakan perusahaan terkadang tidak sampai kepada pekerja	GMS Portal	SMS Blaster
8	Administration process of workers still took much time and make waste workload in the restaurant.	Upgrade Aplikasi Absensi	Employee Self Service (HRIS)
9	Sourcing effectivity for human resources planning for opening the new stores.	Ms.Excel / Open Office	HRIS
10	Organization management are not satisfied with the analysis in the field by marketing and operational department	SIM (Sistem Informasi Manajemen)	Datawarehouse

In IS / IT strategy recommendation should be can define into cost estimation table, so can assists management to decide the recommendation solution of IS / IT that becomes priority. With the suggestion and strategy changes of direction for IS / IT strategy, then the organization structure of IT Division also as a IT strategic step. IT Division

must have the personnel that have qualification to accomplish the strategy.

Tabel 3. *Workforce Recommendation*

No	Usulan Aplikasi	SDM yang dibutuhkan	Usulan untuk organisasi
1	Portal GMS	2 System Developer 1 Application Support	
2	Upgrade SPB	1 System Developer 1 Application Support	Yang Sudah ada 3 IT Operation Support Staf
3	MRP QAD	1 Application Support	2 IT System Support Staf (Developer)
4	SMS Blaster	1 System Developer 1 Application Support	1 IT System & Application Support Spv 4 Application Support Staf
5	SIM (Sistem Informasi Manajemen)	2 System Developer 1 Application Support	1 IT Help Desk Penambahan SDM
6	Learning Management System	1 System Developer 1 Application Support	1 DBA & Network Administrator 2 IT System Support Staf
7	Data Warehouse	1 System Developer 1 Application Support 1 DBA	

With application recommendation that needs by organization as the problems that found. To support the alternative solution that given for organization strategic, then we also need a new infrastructure to support that alternative solution.

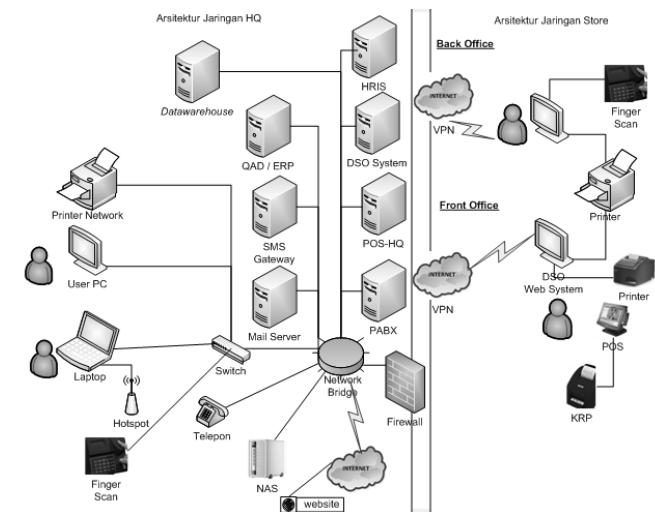


Figure 11. *Recommendation Infrastructure PT. GMS*



2. Implementation Costs for Recommendation Application

Implementation costs for recommendation application already list down based on priority that already discussed and decide by organization management of PT.GMS before.

Tabel 4. *Summary of Implementation Costs*

Recommendation Application	Detail	Qty 1	Price (,000) 2	Total (,000) (3) = (1) X (2)
GMS Portal	Windows Server 2008	1	7,000	7,000
	Server Dual Core	1	16,000	16,000
	Development Team	1	30,000	30,000
Wireless POS	Tablet PC	1	3,000	3,000
	Wireless PDA	60	3,800	228,000
	POS System Development	1	65,000	65,000
	Application Training	1	25,000	25,000
LMS	Windows Server 2008	1	7,000	7,000
	Server Dual Core	1	16,000	16,000
	LMS Standard Version	1	17,900	17,900
	LMS Custom Development	1	120,000	120,000
HRIS	ESS	1	12,000	12,000
	HRIS Enhancement Strategic Module	1	24,000	24,000
Data Warehouse & SIM	Windows Server 2008	1	7,000	7,000
	Server Dual Core	1	16,000	16,000
	SIM Development	1	100,000	120,000
Community Website	CMS Upgrade for Website	1	32,000	32,000
QAD (MRP)	QAD Suites Activate	1	25,000	25,000
	MRP Custom Requirements for PT. GMS	1	80,000	80,000
	VPN	1	15,000	15,000
SMS Blaster	SMS Blaster Application	1	20,000	20,000
				885,900



3. Timeline Implementasi

With agile development application of information systems planning in PT. GMS, then we deliver a project timeline with the steps of agile development phase below:

		2013			2014			2015			
		Jan - Mar	Apr - Jun	Jul - Sep	Jan - Mar	Apr - Jun	Jul - Sep	Jan - Mar	Apr - Jun	Jul - Sep	Ok - Des
GMS Portal	Persiapan Hardware										
	Business Requirements		Function Sefisification Design	Development Phase SIT & CR							
Wireless POS	Persiapan Hardware										
	Business Requirements		Function Sefisification Design	Development Phase SIT & CR							
LMS	Persiapan Hardware										
	Business Requirements		Function Sefisification Design	Development Phase SIT & CR							
HRIS	Business Requirements										
	Function Sefisification Design		Development Phase SIT & CR	Final Delivery UAT							
Data Warehouse & SIM	Persiapan Hardware										
	Business Requirements		Function Sefisification Design	Development Phase SIT & CR							
Community Website	Business Requirements										
	Function Sefisification Design		Development Phase SIT & CR	Final Delivery UAT							
QAD (MRP)	Business Requirements										
	Function Sefisification Design		Development Phase SIT & CR	Final Delivery UAT							
SMS Blaster	Business Requirements										
	Function Sefisification Design		Development Phase SIT & CR	Final Delivery UAT							



4. *EA Repository*

Level	Artifak	Keterangan
<i>Goals & Initiatives</i>	Visi & Misi Organisasi	Contains with direction and business strategic of the organization
	<i>SWOT Analysis</i>	SWOT analysis that discuss internal and external factors of organization, produce EFAS & IFAS matrix for SWOT analysis.
	<i>IT Balanced Scorecard</i>	IT BSC analysis discuss vision, mission, and IT strategic , aligning vision, mission, strategy , prespective mapping of IT BSC, the relationship diagram, determined the target of IT BSC, measurement of IT performance, evaluation of IT performance.
<i>Business Products & Services</i>	<i>Business Process</i>	Describes the main business process of the organization. Which explained into two main activities : Dine In and Take Out / Delivery
<i>Data & Information</i>	<i>Matriks Entitas</i>	Describes the relationship between business activities and subhek data and also the information or data that produced.
<i>Networks & Infrastructure</i>	<i>Network Connectivity Diagram</i>	Describes the infrastructure diagram , IT Infrastructure and IT Infrastructure recommendation of PT. GMS.
<i>System & Applications</i>	<i>Use Case Diagram</i>	Describes use case diagram and diagram architecture of Information systems or application that recommended to organization.
<i>Security</i>	<i>Security Plan</i>	Plan to secure the IS / IT with security, operating system that secured, network security with firewall and organization security.
<i>Standards</i>	<i>Technology Standard</i>	Describes technology and standard spesification that used to recommendation and will be implemented in the future of organization.
<i>Workforce</i>	<i>Skills & Profile</i>	Describes workforce and the organization structure changes , IT staf qualification to support the strategic plan.

CONCLUSION

Conclusion that can take based on this research are that the information technology development of restaurant industry also needed, and

the main development are in operational improvement. In restaurant industry agile development application is the most applicable SDLC, because the lack of users level adoption in use of information technology, while that the brand



image of organization are important in this industry. Then when planning the strategic implementation of IS / IT should make sure that's no more bugs, error ,

either any other technical problems that can disrupt the operational activities in restaurant, and the fast serving into customers.

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