Strategic Planning for IS/IT of XYZ Internet Service Provider Using Ward and Peppard Method

Kadek Dwi Febriyanti[1], Febriliyan Samopa[2] and Rita Ambarwati[3]

Abstract—*PT. XYZ is one of the leading Internet service providers in East Java, Bali and Lombok. As an IT company that has the motto "The Quality Internet Service Provider", of course the role of IT is a significant thing, because with the IT all processes that are initially manual can turn out to be well automated. However, in practice the demand for the development of IS / IT systems from various divisions tends to be only concerned with the interests of the division itself. So that in the end the system produced by the IT Apps division to help a division is not in line with the interests of other divisions. This happens because the IT division does not have a long-term work program plan for developing systems that are adapted to the PT. XYZ business goals and become a top priority in the development of the IS / IT system. In the preparation of the IS / IT strategi c planning framework using the Ward and Peppard Model approach and in evaluating the elaboration of information systems strategic planning and business strategies using Balanced Scorecard and Critical Success Factors. Several analytical methods such as Value Chain Analysis, SWOT Analysis, PEST Analysis and Five Force Model Analysis are used to analyze internal and external business environments. Strategic Grid McFarlan Analysis is used to map application portfolios The result of this research is a blueprint of strategic plan IS/IT in PT. XYZ. Wich included recommendation for improvements in the network structure. While at the SI system is recommended for development id advanced ERP which affect the portofolio application to support the achievement of the vision and mission of the company.*

Keywords—*Strategic Planning, Information System, Information Technology, Telecommunication Company.*

I. INTRODUCTION

Information systems from time to time have developed and caused a change of role from the role of efficiency and effectiveness to a strategic role. The role of information systems (SI) / Information Technology (IT) is one of the factors that can support the progress of a company with a business competitive strategy. Because with the IS / IT in a company, the company is able to increase the effectiveness and efficiency of its operational performance. In order to be able to support operational performance to the fullest, the IS / IT in a company must be designed and built according to the company's needs as stated in the company's strategic IS / IT planning.

PT. XYZ is one of the leading Internet service providers in East Java, Bali and Lombok. To support its business process, PT. XYZ has implemented Information Technology and management of Information Technology managed by the IT Apps Division. The management aims to support the smooth and optimal operation of the company safely, correctly, directed and can be accounted for in accordance with the system and rules that apply.

PT. XYZ as an IT company that has the motto "The Quality Internet Service Provider", of course, the role of IT is something that is quite significant, because with IT all processes that are initially manual can turn out to be well-automated. In 2014, PT. XYZ is developing IT and implementing information systems to support the quality of its services. Some information systems began to be developed and have been used to date. However, currently IT management is considered inadequate due to the current paradigm shift where IT is not only a supporter of operational activities but also a supporter of its business objectives. The existing management methods have many weaknesses.

The Ward and Peppard method was chosen because it was used in previous studies. The research entitled "Information Systems / Information Technology Strategic Planning at PT. Perkebunan Nusantara XI "by Laily Fikriah S.A [1]. From the study using the Ward and Peppard method and being able to produce recommendations that can be implemented by the company. Another study entitled "Strategic Planning Information and Information Technology Systems at the East Java Provincial Manpower Office" by Restu Gandhi Utama [2]. The study also uses the Ward and Peppard method that generates a portfolio of future applications, with recommendations for updates for three applications and produces recommendations for IT SOP updates and IT master plan. Another study that also uses the Ward and Peppard method is the "Strategic Information System for the Implementation of Information Technology at Polytechnic" API in Yogyakarta ", the research conducted by Budiyanto & Setyohadi [3] resulted in several recommendations for information systems and management recommendations of SI / IT for the future of Yogyakarta API Polytechnic.

Based on the initial interviews conducted at the management of PT. XYZ, there are several weaknesses in

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the controlling process carried out by the Technical Manager. The main weaknesses are found in the procedures for developing an IS / IT system that has been carried out incompatible with the D-Net business goal. Where the main task of the Technical Manager is to be responsible for all activities of the IT Apps division, System Administrators and Network Operation Centers, including being responsible for conducting research and technology development that is currently developing. At PT. XYZ itself, application development is carried out by the IT Apps division. However, in practice the demand for the development of IS / IT systems from various divisions tended to only emphasize the interests of the division itself. So that in the end the system produced by the IT Apps division to help a division is not in line with the interests of other divisions. This happens because the IT division does not have a long-term work plan development system that is tailored to the business goals of PT. XYZ and is a top priority in the development of IS / IT systems. One of the impacts that will arise from this is the mistake in determining the priority of work programs and these programs do not support each other. These risks can prevent IT from supporting the achievement of business goals.

IS / IT strategic planning can help in overcoming these problems. As the name implies, SI / IT Strategic Planning according to Ward and Peppard [4] is divided into two elements, namely Information Systems (SI), covering what information must be produced for the organization, while Information Technology (IT) strategies are on technology. The method of Ward and Peppard serves to produce strategic IS / IT plans that add value to the business of the organization, in other words there is harmony with the organization's business strategy. The Ward and Peppard method is also able to produce an application portfolio that can later be used as a basis for making IT investment decisions to fit the previously established strategic plan.

II. LITERATURE RIVIEW

A. Definition of Information System/Information Technology

According to Ward [4] Information System Strategy defines requirements, needs and requests for information and organizational systems in supporting the overall business strategy. Meanwhile, information technology strategies relate to how the organization's demand for information and systems will be supported by technologies such as IT capabilities, IT infrastructure, IT operational services, and system development services and support for users. IT strategies must be controlled by business strategies and system strategies. In conjunction with the rapid rate of change of pressures and business needs, and the capabilities and costs or performance of the components underlying information technology solutions are the ones that change most often [2].

B. Strategic Planning IS/IT

Strategic Planning IS / IT is a process for formulating information strategies for a company that includes the formulation of uses of information systems and management. IS / IT strategic planning includes a variety of tools, techniques and frameworks that are used by management to align IS / IT strategies with business strategies, even seeking new opportunities with the application of innovative technologies [4].

The IS / IT strategic planning model as shown in **Figure 2** consists of three main parts, namely inputm output, and Approach [4]:
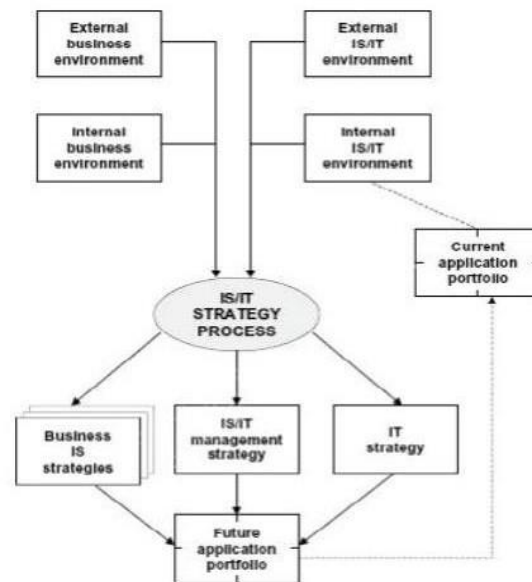

Figure 1. Strategic Model.

C. Relationship Between Business Strategy, IS Strategy and IT Strategy

The Ward and Peppard method tends to look at business strategies, strategies IS and IT strategies sequentially and sequentially. Business strategy as the first and most important strategy. Strategy becomes the main input in developing the SI strategy. The process of formulating the SI strategy identifies what information or application is needed by the business and how these needs will be met. In other words, the SI strategy is support of business strategy.
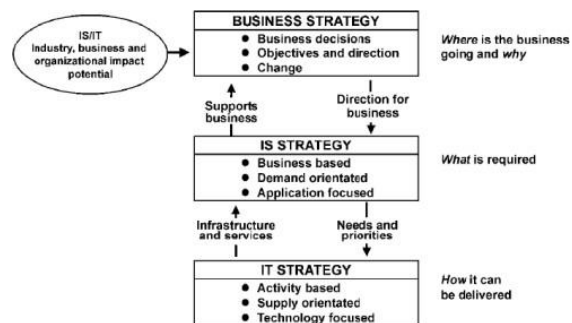

Figure 2. Relationship Between Business Strategy, IS Strategy and IT Strategy

III. METHOD

This research was conducted in several stages. These stages are the preliminary stage, the data and information collection stage, the stage of understanding the current situation, the stage of determination for the future, the stage of strategy formulation and the preparation of the application portfolio. These stages are in accordance with the Ward and Peppard method scheme in **Figure 1**. Schematic illustration in **Figure 3.**
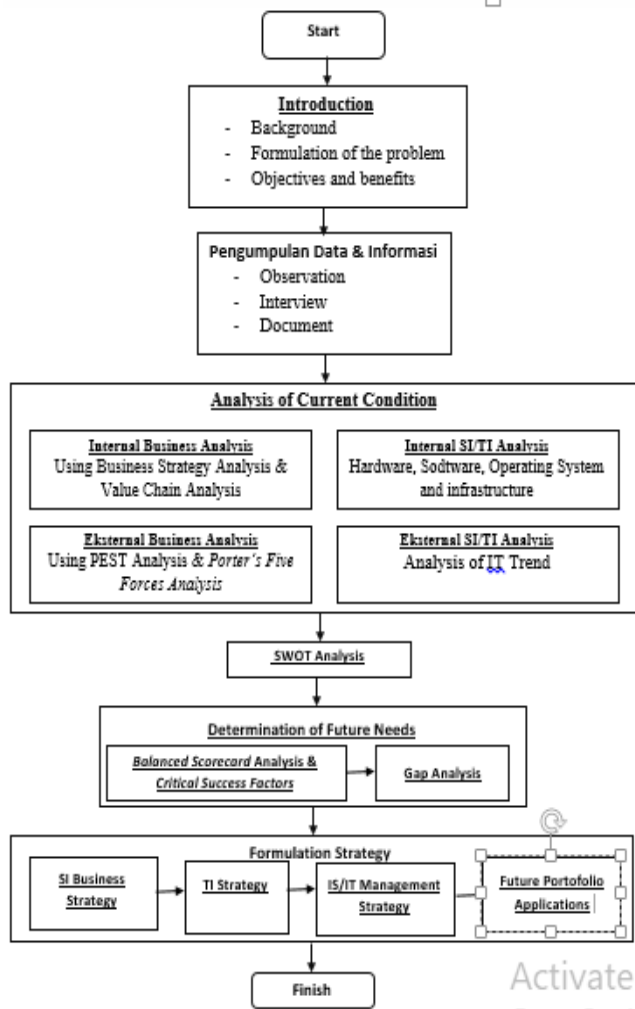

Figure 3. IS / IT Strategic Planning Research Framework.

A. Data and Information Collection Stage

This stage is the stage of collecting the data and information related to the object of research, namely PT. XYZ. Data collecting is done by conduting interviews, observations and studies of documents related to literature studies.

B. Analysis Process of Current Conditions

At this stage, author analyzes and understand current situation and implementing business needs. The steps used to analyze current conditions are as follows :

1) Internal Business Analysis

The internal business environment analysis in this study refers to the conditions and business situation of PT. XYZ. The analytical method used to understand the internal environmental conditions of PT.XYZ can be divided into 2, namely the analysis of the company's business strategy and value chain analysis.

- Analysis of the company's business strategy is done to find out or map the direction and purpose (vision, mission and other objectives) of the PT. XYZ. The result of this analysis is the opportunity to obtain business priority processes and business needs that lead to SI demand.

TABLE 1.
BUSINESS STRATEGY ANALYSIS RESULTS

Code	Analysis Results
BS1	Have a professional organizational structure and keep learning
BS2	Have a positive image in the community
BS3	Focus on customer needs and satisfaction
BS4	Has a strategic office location

- Value chain analysis is used to map activities or activities involved in business processes that occur within the company's internal environment, so that the need for information will emerge. Mapping all business activities can divide into 2 part namely, supporting and primary activities.

From the results of the value chain analysis, the results obtained are as shown in **Table 2**.

TABLE 2.
VALUE CHAIN ANALYSIS RESULTS.

Code	Analysis Results
VC1	Cooperating with third parties as infrastructure providers
VC2	Larger sales targets can still be achieved
VC3	Activities in providing the best service to customers
VC4	HR management related to HR training
VC5	Management of technology and information and investments that have not been optimally carried out.

2) External Business Analysis

To find out the external conditions of business that occur in Indonesia, it can be done using the PEST Method (Politics, Economy, Social, Technology) and the Porter Five Forces Method. The results of the analysis can be used as a reference to carry out business strategies that must be done to achieve the company's strategic goals.

- PEST analysis is used to understand the external environmental conditions of PT.XYZ in general through four aspects, namely politics, economics, social and technology that can affect the company's business. The results of the analysis will be used to determine the business strategy that will be carried out by the company.

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The 1st International Conference on Business and Management of Technology (IConBMT)
August 3rd 2019, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

TABLE 3.
PEST ANALYSIS RESULTS

Code	Analysis Results
PE1	The government applies the E-Catalog for every Goods / Services that will be used by government agencies.
PE2	The government plans to digitize to increase competitiveness in the global market.
PE3	The growing purchasing power of people who are increasingly digitizing
PE4	The emergence of new competitors
PE5	Community dependence on the internet
PE6	The development of cloud computing technology is growing rapidly

- Porter's five forces analysis is used to analyze the conditions of competition that occurThis analysis is formed from several factors, including: threat of new entrants, threat of substitutes, bargaining power of customers, bargaining power of suppliers and competitive rivalry.

TABLE 4.
PORTER'S FIVE FORCES ANALYSIS RESULTS.

Code	Analysis Results
FF1	PT.XYZ dependence on suppliers (other ISPs).
FF2	The price offered is more expensive than competitors service
FF3	Many competitors are starting to provide similar
FF4	Has brand strength that makes customers comfortable using PT. XYZ services

3) Internal IS / IT Analysis

At the stage of the internal environmental analysis, the IS / IT consists of general identification of both infrastructure, resources, the current portfolio of applications used by companies that are mapped into McFarlan's Strategic Grid analysis. Besides that, we will discuss about the current management policy of IS / IT.

TABLE 5.
INTERNAL IS / IT ANALYSIS.

Code	Analysis Results
IS1	There is still a lack of infrastructure currently available
IS2	The IS / IT management policy is still not going well
IS3	Not having long-term planning in developing its information system
IS4	Don't have a system integration between applications with other applications
IS5	There are still many data collection that is done manually
IS6	Existing IT resources still have the potential to be developed

4) External IS /IT Analysis

External IS / IT Analysis refers to the analysis of trends and opportunities of IS / IT that can be used for PT. XYZ.

Code	Analysis Results
ES1	Opportunities to take advantage of technological trends such as cloud computing, Mobile Application, VPS, Virtualization Technology, VPN, IPTV, and Web applications.

C. SWOT Analysis

SWOT analysis is used to evaluate the strengths, weaknesses, opportunities, and threats that PT. XZZ Surabaya has. In this case, analyzing strength can increase strength as competitive capital, while analyzing weaknesses can find out weaknesses. Analyzing opportunities can find out opportunities in the future so that they can prepare themselves to reach opportunities, and the last critical analysis can find solutions to these threats, so PT. XYZ can minimize the threats.

This SWOT implementation program is an application of conceptual several steps in calculating a SWOT analysis that starts from several variables or factors that influence the condition of the company being analyzed.

To calculate the weight, use data obtained from the survey results first. The survey was conducted on 9 people, namely Finance, Operational Manager, Technical Manager, IT Security & Policy, Sales, CRM, HR Manager, Marketing and Communication, and IT Apps as representatives of the assessment of the required weights.

From the results of identification of the factors that become strengths, weaknesses, opportunities and threats based on the tables above, then weighting is done to determine the awareness of the SWOT strategy to be chosen. Weighting is determined through a questionnaire survey given to 9 people (according to the role described in Chapter 3) involved in the research. Where respondents were asked to fill in the values from points 1 to 5.

The next step is to form a SWOT diagram to determine the condition of the company obtained from the total IFAS & EFAS weighting score. The final result of this analysis is a SWOT matrix that describes four sets of strategic alternatives.
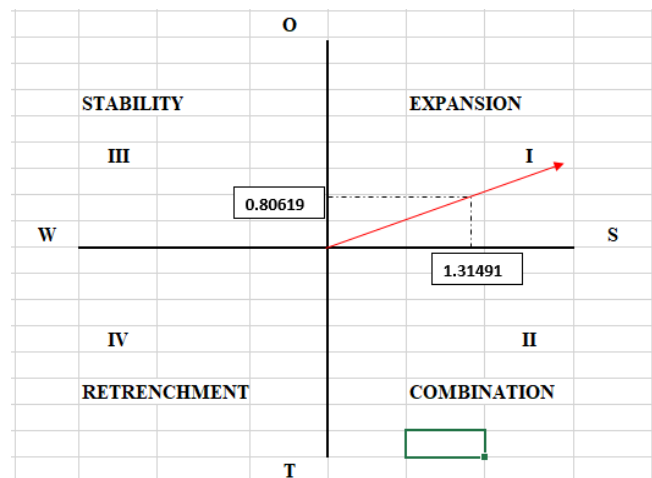

Figure 4. *SWOT Matrix.*

From the results of the IFE and EFE calculation table above, the IFAS value obtained is 0.80619 and the EFAS value is 1.31491. Where IFAS values represent coordinates X and EFAS representing Y coordinates. Then the position of D ~ Net in the SWOT quadrant is at the point (0.80619,

1.31491) which is the SO (Strength - opportunity) quadrant or Expansion in quadrant I where the strategy for using force internal company to seize opportunities that exist outside the company.

D. The Stage Of Determining Future Needs

The next step in analyzing the balanced scorecard, it is proposed to design a strategy map to align and realize it in the form of mapping strategies made based on the vision and mission and the compatibility with the results of the SWOT analysis that has been carried out and the information needs of the Value Chain analysis.
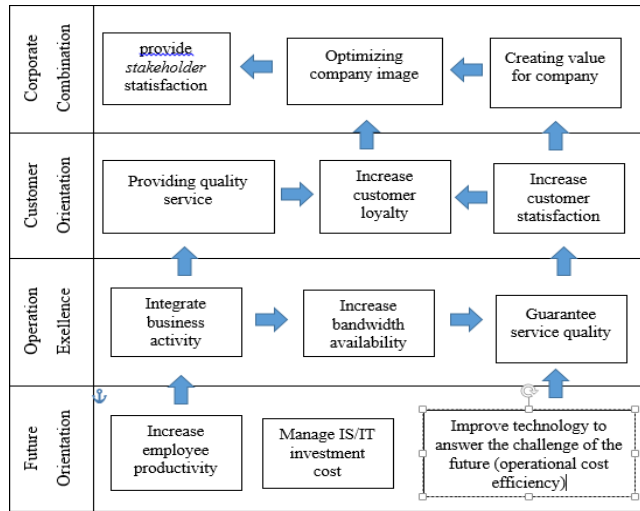

Figure 5. Strategy Map.

- Consolidation of Balanced Scorecard and CSF Analysis Results

Based on the results of observations, interviews and the results of value chain analysis, some information needs that researchers can develop. CSF analysis is made by determining business requirements from the results of BSC analysis, then determining the size of the results, data and information needs. Then it will be given information by carrying out activities.
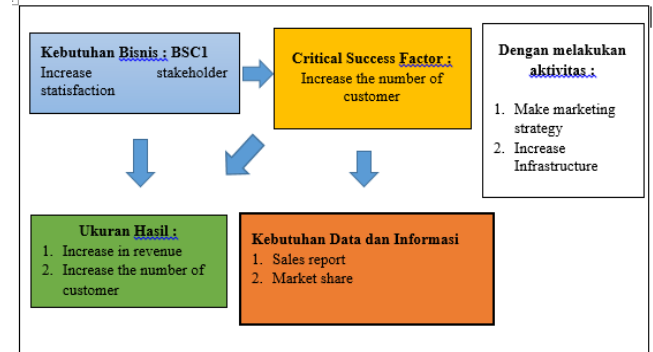

Figure 6. CSF Analysis For BSC 1

- Gap Analysis
1. IS Gap

The information system gap shows the gap between the potential business needs and the needs of SI so that it can provide the right decisions in determining development priorities at a later stage.

2. IT Gap

Information technology gap analysis includes the gap between internal architecture and IT HR PT. XYZ. The results of the gap analysis of IT needs are presented in the Table 8.

3. IS / IT Management Gap

The recommendation of the IS / IT management strategy is a series of management management policies by giving a number of restrictions and rules to support the recommendations of the SI business strategy with the support of stratgeic IT recommendations. For more details see **Table 10**.

TABLE 7.
INFORMATION SYSTEM GAP ANALYSIS

Code	Bisnis Needs Potential	Current Condition	Action	IS / IT Management Needs	Reason
BSC 5	Increase customer loyalty	Available	*Upgrade*	*CRM Modul*	The current system cannot display the sales report. Currently the system only accepts input from the sales team and reports on sales are still reported using Excel.
BSC 6	Increase customer statisfact ion				
BSC 7	Integrate Business Activity	N/A	*New System*	*Erp System*	Currently the existing system is not yet integrated between one division and another, so that some data experience differences.
BSC 8	Increase bandwidth availability	N/A	*New system*	*3rd party application*	Because currently data collection is still done manually using Excel, so CRM must open the file every time it does
BSC 11	Manage IS/ IT investment cost	Available	*Upgrade*	*Finanial System*	Because there are still some features added such as pending billing steatment and data collection on customer tax invoices.

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TABLE 8.
INFORMATION TECHNOLOGY GAP ANALYSIS.

Code	Bisnis Needs Potential	Current Condition	Action	IS / IT Management Needs	Reason
BSC 12	Utilizing technology to answer future challenges (operational cost efficiency)	Available	*Upgrade*	*Cloud computing, IPTV, VPS*	Utilizing information technology trends that are so fast requires companies to continue to grow so that their business and strategy are in accordance with their goals. Currently D ~ Net has implemented several technologies, but the infrastructure currently owned is still inadequate.

TABLE 9.
INFORMATION TECHNOLOGY HR GAP ANALYSIS

Code	Bisnis Needs Potential	Current Condition	Action	IS / IT Management Needs	Reason
BSC 12	Improve employee performance and competence	N/A	New System	*Perfoma nce Appraisal*	Due to conditions when one employee holds 2 positions at once. For example Customer Servise also serves as a Billing division. So it is necessary to improve organizational structure to improve employee productivity with Perfomance Appraisal.

TABLE 10.
RESULTS OF IS / IT MANAGEMENT GAP ANALYSIS

Code	Bisnis Needs Potential	Current Condition	Action	IS / IT Management Needs	Reason
BSC 1	Provide satisfaction to stakeholders		*New System*	*IT Service Management*	The company is expected to implement ITIL (Informat ion Technology Infrastructure Library) to harmonize IT services with user needs, improve the quality of IT services, and make effective use of costs for IT management
BSC 2	Optimizing company image	N/A			
BSC 3	Creating value for the company				
BSC 4	Providing quality service	Available	*Continue as-is*	*Quality Manage ment Service*	Because currently PT. XYZ has impleme nted ISO 9001: 2015 in the company's quality control system.
BSC 7	Integrate business activity	N/A	*New System*	*ERP*	Currently the existing system is not yet integrated between one division and another, so that some data experience differences
BSC 11	Manage IS/IT investment cost	Available	*New System*	*Financial System*	Because there are still some features added such as pending billing steatment and data collection on customer tax invoices

E. Formulation Strategy

In this stage, the IS / IT strategy will be compiled, there are three types that will be generated from this stage, namely the Business SI Strategy, IT Strategy and IS / IT Management strategy. The SI Business Strategy will be a guideline to ensure that the SI supports the achievement of business goals.

F. Compilation of Application Portofolio

At this stage, targets - application targets that are in accordance with the organization's needs and aligned with the company's business strategy will be determined and developed in the future. These applications are mapped in accordance with the 4 McFarlan's matrix quadrants. The first quadrant is an application that is an operational support (support), the second quadrant is an application that must be there (key operational), the third quadrant is an application that is very necessary to support the company's business performance (strategic), and the fourth quadrant is an application that has important potential which must be owned (high potential).

IV. RESULT AND DISCUSSION

A. IS Business Strategy

SI business strategy, which includes how each business function of the company will utilize IS / IT to achieve its business objectives, application portfolio and description of its information architecture. Where below will be explained about the exposure to the SI business strategy in the future.

- *CRM Modul*

Customer Relationship Management is an extension of the company's information system in the field of customer service, which is intended to improve quality and speed in response to consumer demand.

- *ERP System*

ERP is an information system for companies that is designed to coordinate all resources, information and activities used in the company's business processes

- *Financial System*

Making Pending Billing Steatment application and Data collection of tax invoices.

- *3ʳᵈ Party Application*

Making third-party applications for data collection infrastructure used for certain customers

B. IT Strategy

In this section discuss the things needed in implementation of STI based on the potential business needs that have been described in the previous analysis. Here are some recommendations for PT. XYZ :

- Utilizing cloud computing technology in facilitating internal communication and being able to create products / services using this technology.
- Adding infrastructure coverage so as not to depend on third parties.
- Utilizing IPTV technology, so that it can create service innovation.
- Increase employee productivity. This is by utilizing mobile-based applications in service sales transactions and customer service checks.
- Development of employee competencies can be done by training and certification activities

C. IS / IT Management Strategy

IS / IT Management Strategy contains recommendations for future IS / IT management strategies for PT. XYZ based on the analysis that has been done before, as for the recommendations given:

- IT Service Management
- Quality Management System
- Perfomance Appraisal

D. Future Application Potrofolio

TABLE 12.
STRATEGIC GRID OF FUTURE APPLICATION PORTFOLIO

Strategic	High Potential
CRM Modul Quality Management System	Perfomance Appraisal
Key Operational	**Support**
ERP 3rd Party Application Financial System	

V. CONCLUSION

The research results in an SI business strategy, IT business strategy, and IS / IT management strategy and portfolio recommendations that can be implemented at PT. XYZ Surabaya in the future. For the SI business strategy that is produced is adding new applications such as ERP, CRM Module, Financial System, and Third Party Data Collection Application to support the SI business strategy. Then for the IT strategy the recommendations that emerged were the utilization of cloud computing technology, IPTV, and the addition of infrastructure coverage. While for the IS / IT management strategy at PT. XYZ Surabaya is an ERP application as an integration between departments, cost benefit analysis and performance appraisal. The results of McFarlan's strategic grid analysis for the upcoming application portfolio are two strategic applications, namely CRM and Quality Management System. One high potential application is Perfomance Appraisal. Key operational applications with develop status are ERP, Third Party Data Collection Application and Financial System.

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