

# Information Engineering Methodology and Economic Information

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## ABSTRACT

This study aims to obtain maximum results and simplicity in applying Information Systems Strategic Planning Methodology which requires not only technical knowledge of IT, but also need a deep understanding of the company's business, as well as sufficient knowledge about management science and business practices. Given the importance of identifying CSFs in relation to the Strategic Planning Information System on the one hand, on the other hand it is difficult to do so, the necessary studies and surveys are closer both internally within a company or to seeking information outside the company (Benchmarking) then crosscheck and confirm with other information. Given the difficulty of quantifying the intangible benefits. This study uses the method of calculating the value of investment in accordance with its use, in addition to the need to include discounted cash flow methods such as IRR, NPV, and Pay Back Period. The conclusions of this study using methods such as IRR, NPV, and Pay Back Period are expected to provide a clearer picture of return on investment, and project feasibility.

**Keywords** : Economic information, Engineering Information methodology, information system, IT implementation.

## I. INTRODUCTION

Given the IT investments typically require relatively large funds, so it requires careful consideration in the decision to it. By knowing how big the benefits received for the application of IT, the decisions related to investments can be made better. However explore the benefits of particular economic benefit is very difficult to do, especially the presence of the benefits that are intangible. Using the methodology for identifying Information Engineering is possible and quantifying the benefits that occur, both tangible and intangible, to then do a feasibility assessment on investment based on a comparison between cashflow that consist of benefits quantified with an investment that is represented in percentage ROI.

The benefits are qualitative need to assess whether the well known IT project oriented to the user or not, this

analysis is done by means of observation and data processing questionnaires. The Contributions benefit the company expected to be identified among others, the reduction in costs, an increase in productivity, the delivery of goods and services to consumers, increasing the effectiveness of time used to process Billing, precision and control, as well as the information needed by management for the benefit of decision-making. In the end that will have an impact on increasing both the number of customers and the value of its sales.

In order for the application of IT in the company is able to improve the performance and competitiveness of the company, planning strategic information systems that are absolutely necessary. Methodology Information Engineering (Engineering Information) is very useful to be used in the planning of the above, because instead of the approach is systematic and

structured, are also capable of forming a platform (basic framework) system of corporate information, thus enabling subsystems information down to the minutest detail to be developed with time and by different teams without reducing its integrity.

## II. METHODS AND ANALYSIS STAGES TO DESIGN AND IMPLEMENTATION OF IT

To get the most out of this project is to try created the framework of the project analysis procedure , in which the analysis is based on the methodology of Information Engineering , James Martin (1990 ) and the Economic Information Methodology Marlyn Parker (1988 ) .

Framework of methods and stages analysts based on two main theories above can be seen in Figure 2.1 below

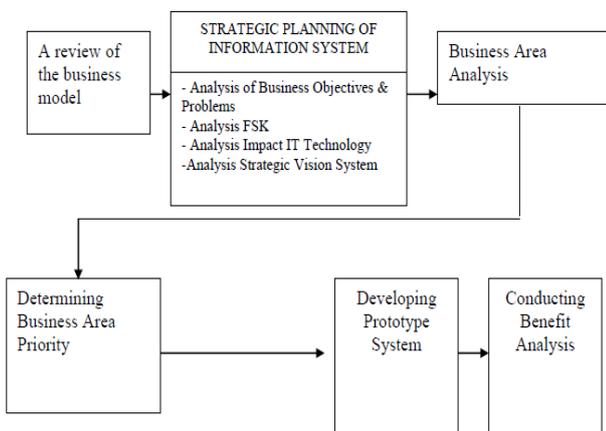


Figure 2.1 Method and Analysis Stages

From the figure it is clear that the phases of construction will begin with a review of the business model , followed by analysis of Interest Business and Problems , FSK , Impact of IT , preparing Vision System Strategic so tegambar Strategic Plan for Information Systems , and created a model of the information needed to prepare the relationship Preliminary data subject , do the decomposition of an existing function , which is then compiled matrix vs. Data subject Business functions , further clustering for identification purposes Business Area

For purposes of analysis of the benefits of a system based on engineering analysis above information , then create a prototype to be tested . Basing on the theory of Information Economics , economic benefits were identified , and to assess the qualitative benefits of data processing is done on the basis of the results of the questionnaire

### 2.1 Business Model

Below I present an example of the business model PT Caraka Yasa . PT . Caraka Yasa is a service company engaged in the delivery of goods which is also called a courier or forwarder , that is a local delivery or in a country region. Referrint to Five Force Models of Michael Potter (1985 ) the business model of PT Caraka Yasa can be described as shown in Figure 3.1 below :

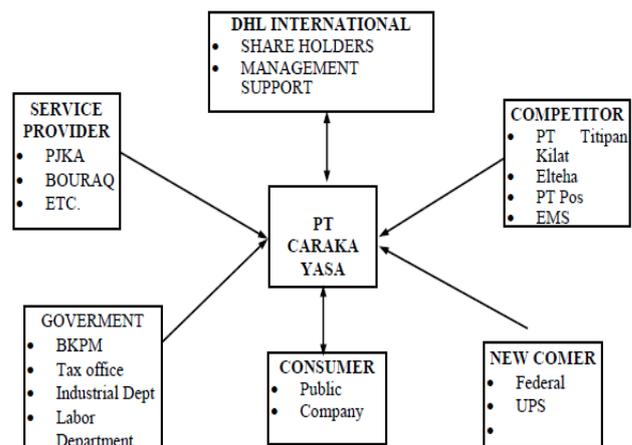


Figure 3.1 Business Model

From the picture above it can be explained that PT Caraka Yasa relates with the consumers of a general category , and consumers that are fixed ( subscription ) that pays the shipping costs on a periodic basis . Given this company is a shipping company where the quality expected by consumers is the speed of delivery and safety of goods and prices are relatively competitive , where it is closely linked to the number of branches and agents owned , therefore the company will always strive to add branches as much as possible , as well as to improve its service . For

shipments outside the city or outside the island, the company requested the services of the supplier delivery services such as for shipping by air using the airline Bouraq, land with PJKKA and so forth, in addition to using their own freight forwarder, therefore the services of these suppliers will dictate the quality of service of PT Caraka Yasa

The competitors of this company is quite a lot, and will continue to increase as companies like these have good prospects. Competitors are local companies that perform domestic shipments for example PT Pos, Elteha, PT Courier Express, EMS and others. Besides the competitors who had exist for a long time, it also appears many other competitors as newcomers are fairly tough and are commonly eg Federal Express and UPS previously not engaged in service delivery in the country (domestic). Although the competition is pretty tight, companies survive and thrive. DHL is also acknowledged that the role that is quite professional in this field have major stakes in improving the company's performance, as well as the shareholders.

The relationship with Government institutions is a common relation, which is associated with licensing, investment, employment, and taxation. Until now there has been no specific rules of the Government concerning the delivery service company, thus the Government does not directly affect the development of the shipping services company. According to the author, until now there is no substitute for product delivery services, the possibility to make their own delivery as a replacement product is relatively small, as described previously given for economic reasons and efficiency of business and individuals to use services delivery company.

### III. A STRATEGIC PLANNING FOR INFORMATION SYSTEM

James Martin split the strategic planning of information systems in eight procedures are divided into two sublayers, which is associated with the division of interests, the interests and the interests of the Top Management Information System Planner Peak Levels. The first sublayer consisting of; Analysis of Goals and Problems, Critical Success Factor Analysis, Technology Impact Analysis and Strategic Vision Systems. While the second sublayer is Overview of the Enterprise Model, Entity Relationship Modeling, Data Modeling, and Process Modelling (James M, 1990, H13)

To facilitate understanding of the IT Strategic Planning Methodology James Martin gives an illustration in the form of a pyramid as seen in Figure 4.1 below:

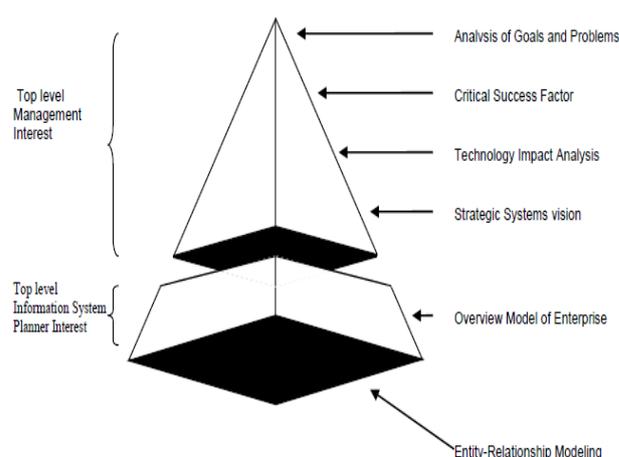


Figure 4.1 Methodology Strategic Planning Information System

From the picture above can be explained that at the top of the pyramid is a process of analysis performed by the Top Management (Top Management) is more related to issues of strategy and planning firms, while at the bottom of the pyramid is a process of analysis in the development of the system information by Peak Level information System Planner. Economic Information is a method of calculation (computational method) which is used to quantify the cost and benefits of IT projects. Economic Information method is a development of

the traditional Cost - Benefit - Analysis ( CBA), ( Marilyn M. Parker , 1985).

Components of the calculation of Return On Investment ( ROI ) as simple as shown in Figure

2.2 , includes the traditional cost-benefit calculation plus Value Linking , Value Acceleration , Restructuring and Innovation Value Valuation.

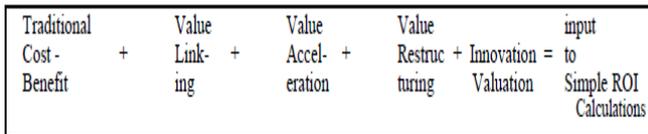


Figure 4.2 Techniques to Make Simple ROI Calculations ( Figure 9.1 , Parker , 1988 , p102 )

### 3.1 Goals and Problems Analysis

The purpose of Business is a very general statement that indicates the direction of the extent to which the company will be addressed ( Jeffrey L , 1989 , H41 ) . There are several krateria is arguably the Purpose of Business namely Objectives Efforts should be written in order to be able to drive any actions to be taken, and also should be measured ( James M , 1990 , h69 ) so that we could easily controlling and controlling whether the Purpose of Business is achieved or not.

Problem or Issue are contained in the company that makes the company more difficult to achieve its business objectives . Sometimes also that the Business Destinations is directed to solving the problem. The Company has set its business objectives for 1998 in the framework of the actualization of the mission and vision, as well as the decomposition of business strategy to establish a growth of 22.7 % per year with profitability by 8 % while overall profits 15 % increase from 1997 .

To achieve the main objective above, predetermined Enterprise goals that is more specific and is a derivative of the Core Business Objectives above , wherein each of the objectives of these efforts will be implemented and accounted for by each division according to their function. In order for the

information system developed to support the efforts of Interest company , should be the identification of the relationship between the Business Interest with the Data Subjects . By looking at the relationship, it can be seen whether an existing data subjects and which will be developed sufficiently relevant or not , and if there is to what extent the level of relevance. It can be said that the more the relationship between objective Enterprises with data subjects or vice versa , the more relevant the chosen data subject , could thus be made priorities to the development of a particular data subjects based on the degree of relevance.

Below is an example of a matrix shaped Enterprises Interest in a particular company engaged in the delivery of goods. and the relevance of the data subject which has been selected in

Table 4.1 below :  
Table 4.1 Matrix Enterprises Interest vs Data Subjects

Enterprises Interest \ Data Subject	Planning	Budget	Financial	Customer Delivery	Supplier	Sales	Payment	Receive	Contract	Product	Product rate	Salaries	Employee	Facilities	Manifest
Increasing the level of sales	x	x		x	x	x			x	x	x				
Improving the quality of service				x	x	x			x	x	x				
Improving the quality of human resources	x	x				x			x	x	x		x		
Improve the good image of the companies				x	x	x			x	x	x				
Develop product and services that is more competitive				x	x					x	x				
Create and enhance the quality of information	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Improve internal communications and relations between branches	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Improving services to branch				x	x				x	x	x				
Increase collection speed				x	x	x			x						x
Maximize cashflow and minimize bad debts risk				x	x	x			x	x					
Reduce conflict with customer				x	x	x			x	x					
Increase employee productivity , and reduce overtime costs				x	x								x	x	x
Improving the efficiency of shipping costs					x	x	x	x	x	x	x	x		x	x

From the matrix above shows that the Data Subjects Pick Up Delivery Order ( POD ) has the most ties with Business Objectives , so that priorities should be paramount to the development of the Data Subjects .

The development in order to obtain maximum results , the information contained in the data subjects should be considered carefully and precisely in order to support the achievement of Enterprises properly.

Besides the level of relevance to be seen with the Data Subjects Business Objectives for the purpose of development of information systems , should also be seen the level of relevance of data subjects who have been with the problems that exist . Below is a matrix listing Problems associated with the Subject Data in Table 4.2 below :

Table 4.2 Matrix of Issues vs Data Subjects

Issue	Data Subjects														
	Planning	Budget	Financial	Customer Delivery	Supplier	Sales	Payment	Receive	Contract	Product	Product	Salaries	Employee	Facilities	Manifest
Low employee productivity				X			X	X	X	X	X	X	X		
Increased shipping costs				X	X	X		X	X	X				X	
the number of conflicts as well as poor management comprehension	X	X											X		
low quality of information	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sales targets are rarely achieved	X	X	X	X	X	X		X							
Increasingly sharp competition	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Labor costs rise				X				X	X	X	X	X	X		X
Cashflow substandard			X	X			X	X							X

From the matrix above, it appears that the Data Subject POD ( Delivery Order / Pick Up Delivery Order ) have been associated with many problems , thus as the previous analysis POD Data subjects should receive top priority and major concern in relation to the development of information systems.

### 3.2 Critical Success Factor Analysis

Analysis of Critical Success Factors ( CSF ) to be performed by System Information Designer , remember this is an instrument approach to understanding the needs of information for executives.

This analysis is needed to avoid a flood of information to executives , especially those who make important decisions. James Martin gives an explanation of the terminology of the CSF, where it was said that the CSF is a limited area, where a satisfactory outcome will determine the competitive performance of individuals , departments , or organizations . In other words CSF is a key area where the "something must be going well " Below I present examples for the same company of CSF associated with Business Objectives will look like in Table 4.3 below :

Tabel 4.3 Matrix Enterprise Interest vs CSF

Enterprise Interest CSF	Consistency transportation availability	Information system that is relative good	Customers ease to access delivery	Communication among each branch
Improve service quality		X	X	
Improving the quality of human resource		X		
Increasing the company's good image	X	X		
Developing a more better service product	X	X	X	
Increasing information quality		X		X
Increasing the internal communication relation and inter branch				X
Increasing the service to each branch				X
Increasing the collection speed		X		X
Maximizing the cash/flow and minimizing the bad debts risk		X		X
Reducing conflict with the customer		X		
Improving the employee productivity , and reducig overtime costs	X	X		X
Increasing efficiency of shipping costs	X	X		X

Data subjects are highly related to the four Purpose Enterprises above need to be a major concern . Because of past analyzes have been made between objective analysis of Enterprises with data subjects , so that we can easily draw CSF relation to Data Subjects . Data subjects related to Business Objectives above four sequential as follows :

1. Pick Up Delivery Order (POD)
2. Contract
3. Product
4. Product Rate
5. Customer
6. Sales

We can see again that the POD Data Subjects are at first priority in relation to CSF, and followed by other

data subjects namely contract , Product , Product Rate, Customer , and Sales . To further success in determining what data and how that needs and deserves to be kept on any Data Subject will also determine the success of the Strategic Planning Information System

### **Technology Impact Analysis**

We need to analyze how the impact of the technology that will be applied in the company of the business we do . The impact of technology could create an opportunity for management (Management Opportunity ) , but can also reverse the threat of competition (Competitive Threat) .

To anticipate IT changes that happen today , to note some of the technologies that are important enough to be immediately applied namely :

Networking Technology. With this system, the access can be done together for a specific data or application programs . Thus the duplication of data and islands of information can be reduced or possibly eliminated altogether . In general, there are two network technologies that is Client / Server and Peer to Peer Client/Server, which is the technology that does the separation between computers that perform data manipulation called client(workstation) with a computer as a storage and data management called Server. While the Peer to Peer do not do the job separation between computers , each computer can be used as data storage and application programs to be accessed by other computers , or as a data manipulator.

Obviously with the application of network technology is able to create opportunities for companies as information becomes easier and faster to come by , given each user can make connections and exchange of electronic data , so this will have an effect on customer service and increased competitiveness of companies .

1. Internet Technology. Internet can be used for the purpose of introduction of the company and its products through the facilities Homepage . For the purposes of PT Caraka , this technology can be used as a tool in data exchange , especially the exchange of data between branches , as well as for the purpose of improving customer service . Internet can be used as Tracking System on goods delivered or to conduct business electronically (Electronic Commerce).
2. Elektronik Data Interchange (EDI). In principle, this technology is almost the same with the Internet , the difference is in the connection technology is done directly , it means our relationship with the other party is on line . This technology is very suitable for use in PT Caraka Yasa which will provide more value for the customer first PT Caraka Yasa has a fixed customer base.

Computer Program Language. These days computer programming language use visualization systems , namely programming with an object system (object oriented) which provides a lot of convenience , high compability , and has an open architecture (open system ) . Thus the programming language and operating system that is capable of providing an opportunity to develop the information system is user friendly and reliable. For a company that is always developing information systems such as PT Caraka Yasa with Object Oriented Programming Language is suitable for use . However , the demands for more adequate hardware is also relatively high , which is to obtain optimum results use at least a Pentium processor with a base of at least 32 MB RAM .

Hardware . Today the hardware capabilities that were previously only be done by a mainframe , can now be performed by personal computers . Obviously this creates its own opportunities for entrepreneurs to get

the hardware with great capability and a relatively low cost . For the purpose of reading data has also grown rapidly in the form of Card Reader and Scanner , a tool that will help a lot in the data input speed and accuracy. Given the number of transactions in PT Caraka relatively large , the use of this technology should be considered.

### 3.3 Strategic Systems Vision

Strategic Systems Vision is a system implemented that allows us to benefit directly above the competition ( James M , 1990 , p127 ). In relation to this case Charles Wiseman reveals several categories of what it calls its strategic Thrusts namely : Differentiation , Cost , Innovation , Growth, and Alliance. Differentiation, namely to differences in products and services of the same product issued by its competitors in order to get a more higher comparative advantage. Cost, that is to decrease the price of products and services. Innovation should always do new innovations to improve the quality of products and services. Growth, conducted a business expansion , both geographically , and add product lines , and product diversification. Alliance, corporate can be merged with other corporat , or conduct a strategic partnership. Blends harmoniously with the vision of the company on the one hand with the impact of existing technological development on the other hand, IT can be a powerful weapon developed a very profitable company. Immediate benefits that can be received by the company on certain IT beneficiaries for the same company can be is identified as follows;

1. Implement IT benefits that can be directly received by consumers, for example can directly access to the company database to check the distribution of freight. It can be applied through Internet technology. Given the kind of company that no one has used this technology, obviously it will improve the competitiveness for different services products company premises products other corporate services. In other words, companies do Product Differentiation.

2. Through the EDI system allows to process orders electronically, so as to increase the speed of transactions. Thus returned Product Differentiation can be formed

3. Creating a new service product (Product Innovation) which is different from competing products through the use of IT, for example, the company boldly Product claimable behind paying customers if the goods received late. The new product tesebut certainly will not succeed without dukungan adequate information system, for example by the application of technology Tracking System, as well as useful in providing good service to customers, it is possible to monitor the smooth delivery.

4. By utilizing the Internet and Intranet technologies are supported by the network architecture, internal communication and inter-branch can be increased, so that the efficiency, effectiveness, and productivity will increase as well, especially since the data more quickly and are available at any time, the elusion of the islands of information, and Data duplication of work, which in turn will lower the company's operating costs.

5. Use Scanner or Data Input Reader is required to increase the speed of data entry and POD accuracy.

From the above analysis , it can be associated with companies that are summarily CSF can be seen from the matrix in Table 4.4 below :

Table 4.4 Relations Strategic Vision System and CSF

Strategic Vision System	CSF	Consistency of transportation availability	Information system that is relative good	Costumers ease to access delivery	Communication among each branch
Internet (Homepage & Tracking System)		X	X	X	X
Networking			X	X	X
Object Oriented Program			X		X
Scanner & Data Input Reader			X	X	
EDI			X	X	X

From the analysis above can be arranged priorities in the application of IT in companies associated with the Strategic Vision System as a strategic IT plan . for the same company Internet technology is the first priority of the technologies relevant to all CSF , and is followed by the application of network technology that is highly relevant to the 3 CSF namely Information Systems yan Relatively Good , Ease Customers Doing Shipping and Communication Between Branch , as well as the relevance of EDI technology , to further followed by the programming language and other software that is based on the Object Oriented technology.

To then be determined Strategic Planning Information System for the next one to three years , and will be implemented gradually as an example can be seen in Table 4.5 below :

Table 4.5 Development Strategic Plan IT PT Caraka Yasa

IT Development Plan	Year		
	1998	1999	2000
Improving the ability of employees in IT			
Network system application with architecture Peer to Peer			
Application and the development of Billing System Application			
Billing System Integration with Accounting Information Systems			
Application of Network Client / Server			
Installation of the Internet and the company and its development Homepage			
Development of information systems at each branch			
Development of online system to all branches via the Internet			
Application of Intranet and Tracking System			
The use of scanners to input the POD data			
Development of Electronic Commerce over the Internet			
Development and implementation of EDI systems			

In relation to the strategic IT plan for 1998 above , in 1997 the company made changes quite dramatically, which bought 11 devices each PC with specs Intel Pentium 166 MMX CPU with 32 MB of memory and hard drive 1.7 Giga Bytes , with Windows'95 using the operating system , each PC connected to one another via a concentrator to form a PC LAN with Peer to Peer network structure . Renewal is intended primarily to support the Billing System .

The Billing system created is expected to assist in achieving the company's business objectives , solve problems , and be able to manage and collect CSF company

The Results of Billing System in the form of Statement per subscription , the total value will be incorporated into Accounting Application that will generate invoices and update directly either to the subledger accounts receivable and Controlling into account in the balance sheet . The plan , if the Billing System has been successful then each process 'll update your billing fatherly sales transactions in the accounting application generates invoices , thus double entry does not happen , in other words on line Processing expected by management can be created.

The programming language used is Visual Basic with MS Access as its database . Reasons chosen these softwares are as described in the discussion of Strategic Vision System

### 3.1.2 Building Framework

At this stage, built a Framework (framework grounding) system to more detailed information, so that the long-term strategic plan of the information system will be in line with long-term plans of corporates.

As is generally the case that the information system in a company has its own separation, which corresponds to the interests of each unit. Are sometimes those systems made by different teams anyway. Thus the overall system becomes so complex because of the involvement of information from many functions in the company. With the reasons mentioned above, the architecture of the data needs to be compiled in order to ensure that each data type can be mutually made and provided, once obtained simplicity in system design and the creation of an integrated system. Business Area Analysis peru done by then grouping

similar functions based on the relationship with data subjects and the cycle of the product, in order to get business areas, while the process is called clustering. His example can be seen in Table 4.6 as follows:

Table 4.6 Matrix The Clustering Function vs Data Subject

Function	Data Subject															
	Planning	Budget	Contract	Product	Product line	Customer	Facilities	Manufact	Order	Supplier	Revenue	Salaries	Financial	Purchases	Payment	Employee
Company Planning and strategy	C	R		R		R						R				R
Annual Plan	C	R	R	R		R						R				R
Project Planning	C	R	R	R	R	R						R				R
Marketing plan	C	R	R	R	R	R						R				R
Funding Plan	C	R										R				R
Price setting		C	C	C	C											
Cold Calling				R	R	R										
Telle Marketing				R	R	R										
Managing the fleet							R									
Negotiating with vendor for ticketing							R			R						R
Handling Customer enquiry & complaint				R	R	R	R									
Pick up & Delivery						R				Operation						
Keep and managing the package						R										
Air Consignment						R				C	R					
Supervision the branches	R	R	R	R	R	R										
Monitoring and control the branches	R	R	R	R	R	R										
Order entry (POD)				R	R	R	R									
Handling cash sales				R	R	R				C						
Statistical and Financial reporting												C				
Budgeting		R										R				
Payroll													C			R
Account Receivable & Acc. Payable						R	R	R	R	C	C	C	C	R		
Collecting						R										
Taxes										Accounting & Finance	R	R	R	R	R	R
Purchasing											R					
Cassier		R						R	C	R	C	C	R	C	R	
Human resources	R															C
Personel						R										C
General Affair																C

From the above matrix obtained Area map Business, Business Area which shows the relationship between the group of subjects with data which is function as a corporate information system framework .. Business Area to identify by clustering process above teridiri of Business planing, Marketing, Operations, Billing, Accounting & Finance, and Personnel & General Affairs where the sequence follows the sequence of the lifecycle of the product. Business area marked by the black box in the matrix, each representing a system of information on the group responsible for the creation and maintenance of a wide variety of specific data classes.

If the Area Business Billing linked to CSF, then it is likely that the Area Business Billing relate to all CSF, it is given the Business Areas Billing consisting only of the Subject Data POD, and on a previous analysis shows that the Subject Data POD touch with all the Purpose of Business, as well as the level of relevance to do with the problems faced by the company is quite high. , Thus Billing Business Area has relevance level high enough relationship with Business Objectives of the company, in other words Billing System to be one of the company's IT Strategic Plan implementation is

closely linked to the business strategy of the Company.

If seen from the relationship the relationship between the Business Areas with other Business Areas can be seen in Table 4.7 below:

Table 4.7 Matrix Relation Between Business Area

Function	Data Subject															
	Planning	Budget	Contract	Product	Product	Customer	Facilities	Manufact	Order	Supplier	Revenue	Salaries	Financial	Purchases	Payment	Employee
Company Planning and strategy	C	R		R		R						R				R
Annual Plan	C	R	R	R		R						R				R
Project Planning	C	R	R	R	R	R						R				R
Marketing plan	C	R	R	R	R	R						R				R
Funding Plan	C	R										R				R
Price setting		C	C	C	C											
Cold Calling				R	R	R										
Telle Marketing				R	R	R										
Managing the fleet							R									
Negotiating with vendor for ticketing							R			R						R
Handling Customer enquiry & complaint				R	R	R	R									
Pick up & Delivery						R				Operation						
Keep and managing the package						R										
Air Consignment						R				C	R					
Supervision the branches	R	R	R	R	R	R										
Monitoring and control the branches	R	R	R	R	R	R										
Order entry (POD)				R	R	R	R									
Handling cash sales				R	R	R										
Statistical and Financial reporting													C			
Budgeting		R											R			
Payroll														C		R
Account Receivable & Acc. Payable						R	R	R	R	C	C	C	C	R		
Collecting						R										
Taxes										Accounting & Finance	R	R	R	R	R	R
Purchasing											R					
Cassier		R						R	C	R	C	C	R	C	R	
Human resources	R															C
Personel						R										C
General Affair																C

Seen that Area Business Billing will update them on the data subject Delivery Order ( POD ) on the basis of data that is created and updated by the Business Areas Marketing , which then subjects The data will be read by Area Business Operation for the purpose of sending and checking the goods that have been and will be sent , in addition to the Business Area Finance and Accounting will be read for the purpose of making a billing invoice , as well as the recording of receipts over cash sales .

**3.4 Data Modeling and Entity Relation**

Meta - data set must be able to meet the needs of the information associated capabilities to support the achievement of Enterprise , problem solving , and able to manage and identifies CSF.then the data model must be set properly . as well as the relation of the subjects of the data to other data subjects need to be defined carefully , otherwise it is not likely there will be some major problems such costs will be incurred

for maintenance , unstable , and it will take a long time if there is a change .

By way of normalization allows the data records are easy to understand , and produce a more stable data structure that accommodates to do change , it also prevents anomalies that may occur .

**4.5 Analysis of Benefits System ( An example of of the billing system ) .**

Value linking and Value Acceleration is linking the benefits of the effects of their relationship with enterprise IT . There is a specific distinction between Value linking and Value Acceleration, Value Linking does not depend on time , while the Value Accelertion otherwise.

For example benefit analysis can be explained sebabagai follows; assuming that the investment will be depreciated over five years, if the calculated annual cash flow to obtain a simple ROI , can be seen from Table 4.8 below :

Table 4.8 ROI Calculation On Billing System Investment

A. System Development Investment Cost						62,222,250
B. period 5 Cash Flow times 12 month on implementation						
Billing system						
	TAHUN					
	TAHUN1	TAHUN2	TAHUN3	TAHUN4	TAHUN5	
Ekonomic value Benefit :						
Value Acceleration	24,960,000	24,960,000	24,960,000	24,960,000	24,960,000	
Value Linking	43,680,000	43,680,000	43,680,000	43,680,000	43,680,000	
	68,640,000	68,640,000	68,640,000	68,640,000	68,640,000	
Cost Reduction	40,392,000	40,392,000	40,392,000	40,392,000	40,392,000	
=Income	109,032,000	109,032,000	109,032,000	109,032,000	109,032,000	
(-) Maintainance Cost	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	
= net Cash flow	99,032,000	99,032,000	99,032,000	99,032,000	99,032,000	495,160,000
Simplified C ROI						159%
(495,160,000/5/62,222,250= 159%)						

From the table above shows that the company is getting a high enough ROI that is 159%, the value is obtained from the following calculation:

1. The benefits on labor savings amounting to RP. 40.392 million
2. The economic benefit, namely the impact of acceleration on the bill, which is an acceleration value of Rp. 24.96 million

3. The economic benefit, namely the impact of the intangible form of increased productivity, which is the linking value of Rp. 43.68 million, -

4. Third value of cash in flow above are summed, resulting figure of Rp 109.032 million, to then subtract the cash out flow in the form of annual maintenance costs of Rp.10.000.000, -, and can net annual cash inflow amounting to Rp.99.032 .000, -

5. ROI can be calculated directly calculated by dividing the annual net cash inflow with an investment that is (Rp. 99.032 million / USD. 62.22225 million) x 100% acquired 159%

This shows that the economic impact on the implementation of Billing System is very positive, as evidenced by the 159% ROI earned on investment.

**4.6 Benefits Viewed from Users Party**

To see the immediate benefits received by the user, can be done by distributing questionnaires to users of the system, for example, can be the result of the discussion on the implementation of Billing System as follows; after the system is tested over a period of approximately 2 months, basing on the questionnaire data analysis found the following benefits;

1. For the management:
  - a) As an important tool in the provision of data and information
  - b) Provide the ease in obtaining data quickly and accurately
  - c) Improve the quality of performance because it can provide a means for data analysis as a basis for decision-making
  - d) Support the achievement of objectives and resolution of issues because it is supported by a complete and useful in decision-making

2. For users of other information, Billing System is able to provide a relatively adequate information services to all users of the operator level to

supervisor who runs the operational tasks (not a managerial decision makers) as supported by the data that is complete, current, and reliable, as well as providing menganalisisnya ease of access and to obtain information as desired.

#### IV. CONCLUSIONS

From the discussion above authors can propose the following conclusions;

1. Information Engineering methodology is very helpful in establishing the Strategic Planning Information System, so that any information system developed can be secured in line with its business strategy, as well as Billing System which has got the main priorities to be developed based on this method, it becomes relatively easy and directed in development.
2. Using the methodology of the economic information, DAPT economic impact can be found quantified for example a form of reduced labor costs, and the acceleration values in the form of bill collection rate that generates a certain cash inflow figure, the latter is the form of increased productivity Linking Value characterized by defective goods such as reduced and late send, so the claim rate decreases and increases the company's image, which in turn will increase sales turnover by cash inflow demikian tentrun the ROI value of a system can be specified include pay back periodnya.
3. Analysis and design of a system developed with reference to the architectural framework that is created as the application of IT strategic plan developed information through the methodology of Information Systems Strategic Plan, where this strategic plan linked to strategic business plan of the company, thus enabling the development of these subsystems separately and provide benefits to users as expected.
4. Analysis of CSF has been able to identify priorities and the establishment of Business Objectives Strategic Vision Systems company, so as to create the priority scale enterprise information systems development.
5. Analysis Business Area has been able to form the framework of corporate information systems that are useful in the development of information systems, in this way the corporate information systems can be broken down into parts that are smaller, each of which has responsibility for different data, so without compromising its integrity, enables Business Area can be developed one at a time and by a different team of developers. With this analysis of data duplication resulting in islands of information can be avoided
6. Prototype Billing System is a representation of the implementation of the Strategic Plan for Information Systems were very helpful in improving communication between information system planner with both the operational level and the management level, as well as to assess the benefits of IT projects.
7. The method is very useful in the Information Economics penyelusuran economic benefits of an IT project, especially the identification and quantification on intangible benefits as well as ripple effect that occurs.

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