Utilization of the Business Process Maturity Model as a Proposed Architectural Planning of Business Model Concept

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Abstract

This research is a part of previous research that succeeded in producing business model architecture planning, the purpose of this study was to develop previous research using the measurement method of business model maturity as a proposed business model architecture planning concept. By taking the same case study theme as the Tiara Payung Putra (TPP) company. TPP is known as a distributor company in cooperation with Pertamina (Bulk LPG Freight and Filling Station). TPP's main business activity is distributing goods in the form of LPG to 76 bases spread across Balaraja district. The current condition of the business model architecture illustrates the business activities that exist in the TPP. The main problems that occur in TPP are not integrating external systems with internal business activities in the company, and lack of IT resource support. For this reason, the Business Process Maturity Model is needed as a benchmark, which can be proposed as a business architecture planning concept. The business process maturity model process is supported by data validation obtained through respondents, namely business stakeholders in TPP, the process for validating the data by distributing the Assessment questionnaire consisting of 8 Parts the Business Process Assessment model, and 3 Parts for IT Application Readiness Assessment. support of the Enterprise Architecture Planning (EAP) Framework method which focuses on the business model architecture domain. The architecture of the business model illustrates how TPP carries out business activities and functions to achieve its objectives. The results of this study produce the proposed business model architecture planning concept in the form of Business Model Maturity Level Measurement, the IS / IT architecture concept, and the Business Architecture Planning roadmap, which are beneficial for the Tiara Payung Putra (TPP) company for the business model architectural planning.

Keywords: Business Process Maturity Model (BPMM), Planning, Business Architecture, Enterprise

Introduction

Enterprise Architecture Framework (EAF) is a framework used to describe and describe the scope of a collection of architectures. In this framework the relationship between architecture is described. The relationship between architecture and the complete picture will accelerate the process of architectural development (Wahyu and Firmansyah 2018).

Enterprise architecture is a tool used to build the alignment of business strategies with information technology, which provides a systematic approach to managing system assets and information and directs strategic business needs with planning and portfolio management that is appropriate for capturing information needs when changes in the business environment occur (Anggrainingsih et al. 2016). The business architecture describes the current state of the company's business by determining the business model or business activity. This architecture will be the basis for designing the architectural phase of IS / IT. The objective to be achieved in this phase is to describe how the company carries out business activities and functions to achieve the company's objectives, so that it can become the foundation for making architectural plans by outlining the gap analysis.

Tiara Payung Putra (TPP) is a company which operates as a LPG Distributor in cooperation with Pertamina's Bulk LPG Filling and Filling Station. The company is located in the West Balaraja area, has 10 trucks and 76 agents spread across the Balaraja district.
The problems that occur in TPP business activities are as follows :
a) Currently TPP does not yet have an enterprise business model architecture that can be used as a reference in business activities.
b) The absence of IT resources, namely IT users who influence the development of the use of Information Technology in the long run that can provide added value for business people.
c) The concept of the business model currently used for LPG distribution is done by computerization using Excel and Word which functions as a supporting tool for data management, and the process is not integrated with the external system as a whole.
d) No integration of the external system with internal business activities in the TPP

in this issue, the concept of business architecture planning can be done by measuring the maturity level of the business model in TPP, in a previous study (Gandhi 2017) "The way to assess the level of business process management in a company is by the Business Process Maturity Model. BPMM measurements will be carried out in various fields companies related to business process practices "The functions related to use in previous studies are (GARINI 2017)" BPMM is used as a facility to measure business process management in companies so that it can be used as an improvement in achieving success "for that before planning a business architecture, it is necessary to measure position business model in TPP.

Contributing to previous research (Marini and Sarwindah 2019) "Successful business architecture design proposals are produced that can integrate key business activities. This also shows that Business Architecture is one of the key components to determine how well IT has aligned with its business objectives". based on the results of previous studies, the research has been completed and produced a business model that is aligned with IT. so planning a business model architecture, of course, can be useful to assist top-level management in making short-term and long-term decisions, and can enhance competitive advantage that can meet customer needs.

In previous studies, business architecture planning is done by referring to the EA method used, the use of the Enterprise Architecture Planning method focuses on the business architecture domain. By developing research carried out previously, which focuses on the use of Business Model Maturity Level Measurement used as a reference for making architectural planning concepts.
The process of identifying business activities is based on existing business scenarios at TPP. The importance of the Business Architecture is used to map business needs and Information Technology throughout the entire scope of the organization. The purpose of this study can produce a proposed business model architecture planning concept that will benefit Tiara Payung Putra is coming.

Literature Review

Business Process Maturity Model (BPMM)

In assessing the level of maturity of an organization, the maturity model acts as a frame of reference, with which current status is assessed using a model or valuation method (Tarhan et al. 2016).

The main focus of BPMM is on a culture of performance, improvement, and management excellence, and it differs from other models in that it guides the improvement of business process management specifically (Heller and Varney 2013).

Evaluation of organizational practices against the model - the so-called " assessment " is the level at which the organization currently stands. This shows the ability of the organization to execute in the area concerned, and the practices that are the focus of the organization in order to see the greatest improvement and highest return on investment (Version 2011).

Table 1. KPA's BPMM

Level	Focus
Level 5 : Optimization	Proactive Process Improvements (Product & Process Focus)
Level 4 : Quantitatively Managed	Quantitative Management (Product & Process Focus)
Level 3 : Defined	Organization, Process Standardization (Product Focus)
Level 2 : Managed	Work unit, Process management (Product Focus)
Level 1 : Initial	Ad-hoc

Based on Table 1. KPA BPMM: BPMM can be seen from 9 aspects, including strategic views, resolution and documentation processes, assessment and management processes, organizational processes, human management, organizational culture processes, markets, supplier support, and information system support (Muchsam et al. 2011).

Enterprise Architecture Planning (EAP)

Enterprise Architecture (EA) is a framework that was first developed in 1987. EA was built to solve problems related to complex systems and systems that are not in harmony with the business (Wahyu and Firmansyah 2018).

Enterprise Architecture Planning (EAP) is part of the EA framework. this methodology was first coined by Spewak and Hill. Enterprise Architecture Planning EAP is the process of defining the architecture of a company or organization that is useful for supporting business along with planning the implementation of that architecture. EAP is a top two level development method of the Zachman framework (Liana et al. 2019).
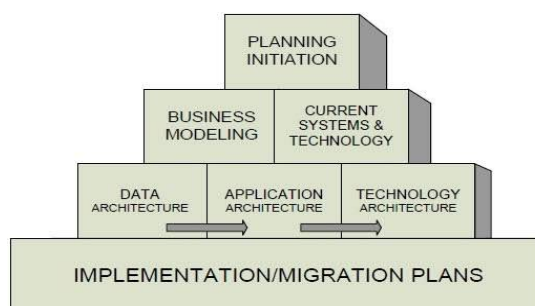

Figure 1. EAP Architecture Layer

Explanation From Figure 1 :

A) Layer 1: Initialization Planning
Planning initiation means determining the pathway for planning the company's architecture, including which methodology is used, who should be involved, and what tools are used. This leads to the production of a work plan for EAP and securing management commitment to go through the next phase (Astri and Gaol 2013).

B) Layer 2: Initializing the Overview of Current Enterprise Conditions
1. Business Process Modeling
The aim of the business model is to provide a complete, comprehensive, consistent knowledge base that can be used to define architecture and implementation plans (Astri and Gaol 2013).
After the business process is defined, the organizational structure of the organizational unit is identified. The function area and its business processes are paired with organizational units, with the aim of identifying the scope of decision making responsibilities and the involvement of each organizational unit in each area of business functions and / or processes (Surendro 2007).
2. Current Systems & Technology
Enterprise that has been running generally has a system and technology. The step in the current state of the analysis phase is to document and define all the systems and technologies that are being used. The documentation is referred to as the Information Resource Catalog (Surendro 2007).

C) Layer 3: Initialize Enterprise Plan Review
1. Data Architecture
Data Architecture identifies and defines the main types of data that support business functions that are defined in the business model. Data architecture consists of data entities, each of which has attributes and relationships with other data entities (Astri and Gaol 2013).
Examples of data architecture in the input process are function definitions, information source forms, sample information sources, interview notes, systems and files that have descriptions, data architecture or other database designs. The process of defining each main data entity and supporting functions, creating Entity Relationship Diagrams for each function, mapping data entities to business functions, defining Information Architecture. Output: List of entities according to business function and each ERD function (Astri and Gaol 2013).
2. Application Architecture
The purpose of the application architecture is to determine the main types of applications needed to manage data and support business enterprise functions. The application architecture is not a design for the system, nor is it a detailed requirements analysis. This is the application definition of what will be done to manage data and provide information to people doing business functions. Input: list of candidate applications, specify applications and connect applications to functions. Process: determine the list of candidate applications, application descriptions, analysis of the impact on the current application. Output: new list of applications (Astri and Gaol 2013).
3. Technology Architecture
The purpose of a technology architecture is to determine the main types of technology needed to provide an environment for applications that manage data. This is the definition of a type of technology - referred to as a platform - that will support businesses with a shared data platform providing a means to collect data from any business unit. Input: list of application candidates, technology platforms. Process: identifying technology platforms and principles, defining platforms and distributions, connecting technology platforms with business applications and functions, distributing technology architectures. Output: technological architecture (Astri and Gaol 2013).
D) Layer 4: Initialization of the Implementation Plan

Implementation of enterprise architecture is done to produce the concept of information systems architecture and technology architecture. The EAP approach suggests that the sequence of processes is carried out using an architecture roadmap (Surendro 2007).

Framework of Thinking

The concept of the framework of thinking made modifies the concept in the EAP framework, by creating a framework that is continuous from the process architectural planning (Business Process Model Assessment) to the proposed recommendations of the business architecture concept, each of which influences the process for modeling business architecture concepts at Tiara Payung Putra (TPP).
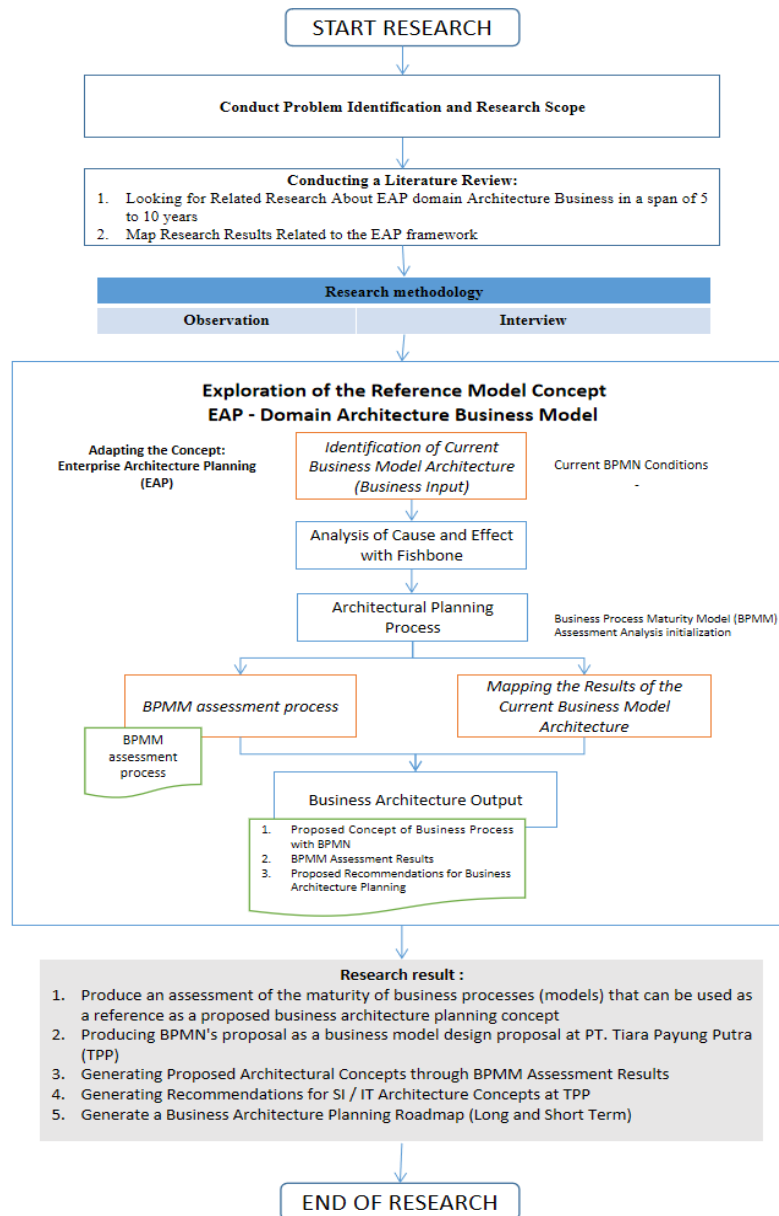

Figure 2. Framework Of Thinking

Explanation From Figure 2 :

The EAP (Enterprise Architecture Planning) Thinking Framework used focuses on the Domain Architecture Model Business at Tiara Payung Putra Company. This architecture defines the outline of the stages of business architecture that is Identification of Current Business Model Architecture,

Analysis of Cause and Effect with Fishbone, Architectural Planning Process, BPMM assessment process (Define BPMM assessment process), Mapping the Results of the Current Business Model Architecture and Business Architecture Output (Proposed Concept of Business Process with BPMN, BPMM Assessment Results, & Proposed Recommendations for Business Architecture Planning).

Research Methodology

This research methodology focuses on the EAP framework. In Figure 3. below explains the contribution of research related to the theory used in the architectural planning process, referring to the EAP framework with the support of some analytical methods. The analysis method is useful as a benchmark for making business model architecture. The final result of this research is to propose recommendations for making business model architecture in TPP.
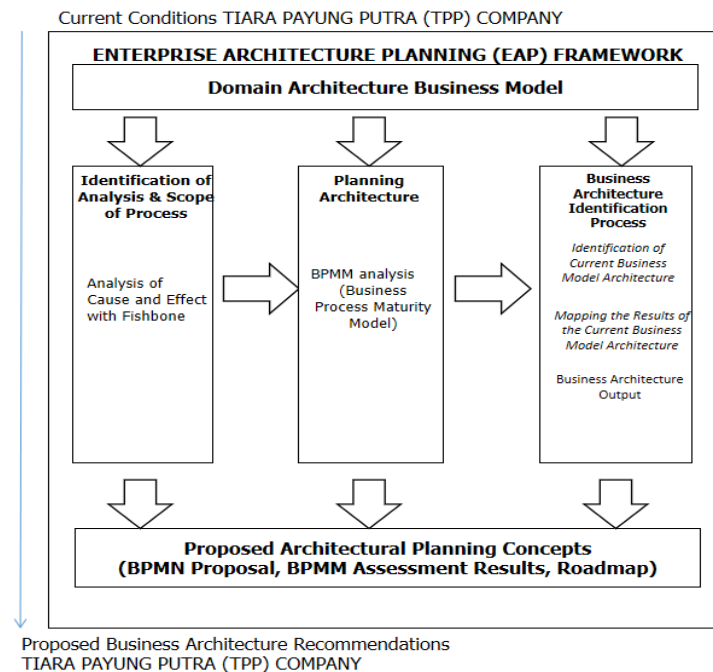

Figure 3. Research Diagram

Explanation From Figure 3 :

In the picture above explains the research contribution related to the theory used in the architectural planning process, referring to the EAP framework with the support of some analytical methods. The analysis method is useful as a benchmark for making business model architecture. The final result of this research is to propose the concept of a proposed business model architecture in TPP.

Research Results and Discussion

In this section the discussion will be carried out in accordance with the research framework that is used as a reference, the following are the stages of research results :

Data Collection Techniques

The technique of collecting data on the research process used to achieve the objectives formulated in the study is as follows :
A) Observation

Observations This research was conducted to determine the current business model and the data / information needed, for that observation was conducted at Tiara Payung Putra (TPP) Company.

B) Interview

In this interview method, researchers conducted interviews with employees, Managers and Directors of the Tiara Payung Putra company, asking related questions.

C) Literature Review

Literature Review is carried out using sources such as National / International Journals with a range of at least 5 years and a maximum of 10 years,

D) Expert Judgement

Validation is carried out and tested by (expert judgment) or expert judgment according to the field, while the stakeholders taken to become expert judgments are the PIC Support Head, Warehouse Manager and Financial Administration Manager.

Identification of Current Business Model Architecture

Identification The current business model architecture is the stage for identifying the business processes currently on TPP.

A. Process of LPG Gas Requests to Pertamina

TPP Conducts LPG gas Requests by attaching an email schedule agreement (PO) containing the plan for the realization of gas distribution to the base, if the data is suitable, it will be sent to Pertamina's, if it is not suitable, revision data will be revised.

B. Process Order Requests Through Agents To TPP

Agent / Base in collaboration with Tiara Payung Putra (TPP), Can Request LPG gas (Subsidies / Non-Subsidies) by Phone, then TPP Receives LPG Gas Requests Via Telephone. The admin section checks the availability of LPG gas through the General Ledger. If available, make a PO Order for LPG gas and plan for the realization of gas distribution to the agent / base (Telephone Confirmation).

C. Process of Stock Inventory Entering from Pertamina to TPP

Letter of Delivery for LPG gas delivery for later checking and recording of LPG gas stock (subsidized/non-subsidized). If in accordance with Realization Plans, TPP Warehouse records according to Stock Availability in books and copies to excel data, if it is not the same, the delivery complaint is not appropriate by sending an email to Pertamina's, with a Maximum Wait of 14 Days.

D. Stock Process Out of TPP

TPP Receives LPG Gas Requests (Subsidized / Non-Subsidized), carried out checking at the warehouse, if not available then PO pending, Waiting for Confirmation within H + 1 Maximum H + 7. if available, LPG Gas Stock Confirmation is available. The administrative division of TPP prepares PO Letters for LPG gas orders and plans for the realization of gas distribution to agents / bases (Telephone Confirmation). Once it is okay, a delivery letter and LPG road letter are made, which is then given to the courier.

Analysis of Effects With Fishbone

Analysis of Cause and Effect with Fishbone, namely Analysis conducted by determining the cause and effect of the existing business model at Tiara Payung Putra, the following is in figure 4. below :
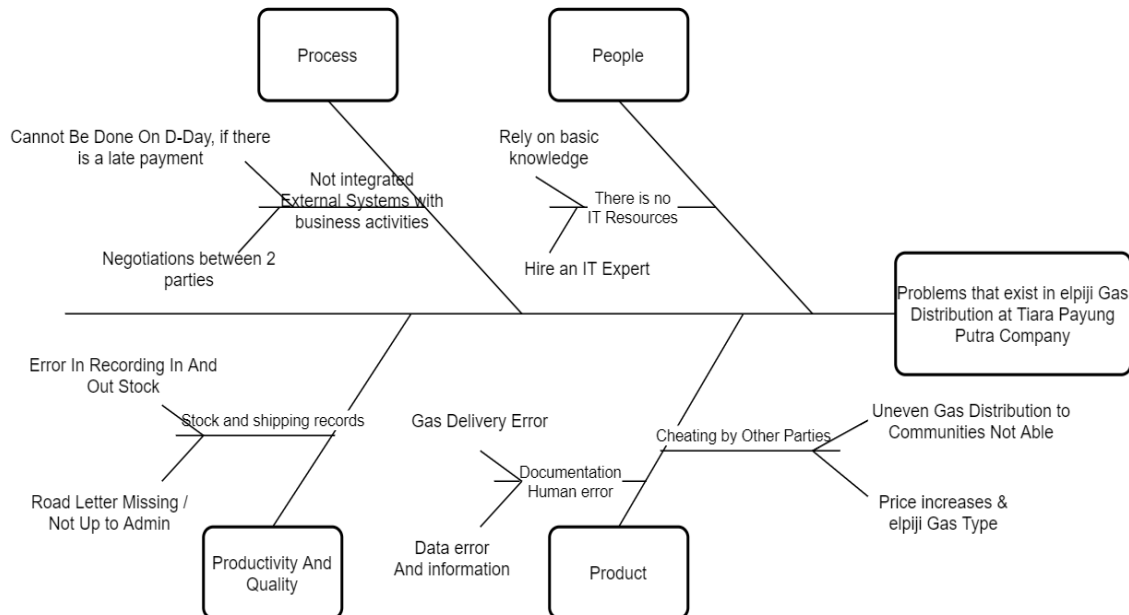
Figure 4. Analysis of Cause and Effect with Fishbone

Explanation From Figure 4 : This causal analysis describes the problems that occur in the distribution of LPG in Tiara Payung Putra. Includes fishbone diagrams with the concept of 4P (People, Process, Product and Productivity Quantity).

Architectural Planning

Architectural planning contains the definition of the Business Process Maturity Model (BPMM) Process Assessment, and the BPMM criteria.

A) BPMM Assessment Process

Component to be able to assess the ability of a particular organization. As that capability develops, the company can develop through the second dimension of the model; that is, Process Maturity Status (Fisher 2004). this section will explain the BPMM assessment process by describing the description of the number of assessments and the total assessments that will be validated by respondents. The following will be explained in Table 2. the BPMM assessment process :

Table 2. BPMM assessment process

Name of Assessment	Amount	Unit	Total Assessment
Business Process Assessment (Model)			
1) Value of Strategic View Areas	5	Question	
2) Process Area Values Definition & Documentation	7	Question	
3) Value of the Measurement & Management Process Area	7	Question	
4) Value of Organizational Process Structure Area	7	Question	47 Question
5) The Value of the Human Management Area	5	Question	
6) Values of Organizational Culture Process Areas	6	Question	
7) Value of Market Orientation Area	7	Question	
8) Supplier's Viewpoint Values	3	Question	

Name of Assessment	Amount	Unit	Total Assessment
IT Application Readiness			
9) Application Viewport Value	7	Question	
10) Value of Infrastructure View Area	5	Question	18 Pertanyaan
11) The Value of View of Information Technology Resources	6	Question	

Mapping the Results of the Current Business Model Architecture

Based on the problems that occur mapping will be done, by identifying current changes, the results of the analysis, and architectural targets. Mapping a gap analysis will produce a solution. As for the analysis of business architecture gaps can be seen in Table 3. below:

Table 3. Gap Analysis And Target Architecture

Current gaps	Analysis Results	Arsitektur Target
No external system integration with internal business activities in Tiara Payung Putra (TPP)	- Delivery cannot be done if there is no direct communication and payment notification.	The Internal Information System Integrated with external Pertamina's business was carried out.
Computerization using Excel and Word, with a level of loss & buildup of documents that are very likely to be found by human error.	- LPG gas that is sent often has errors in delivery, especially in the provision of registration of road letters and plans for the realization of LPG distribution from TPP to the base. - The recording of LPG gas stock in warehouses is not the same as the data in Pertamina's external system.	Performed making Information Systems: 1) Inventory Control Management Information System 2) Distribution Monitoring System
Lack of IT resources to support business process activities at Tiara Payung Putra (TPP).	- Rely on basic knowledge about IT through internet media in every business process. - Hire IT experts for maintenance operations such as hardware and software.	Adding IT organizational structure and recruitment of IT resources that are reliable and able to align IT and Business readiness.

Business Architecture Output

Business Architecture Output is the result of research, in this section describes the process of BPMM assessment results :

a)   Data acquisition of respondents is primary data or data obtained directly through by *Google Forms*, data is filled out by distributing questionnaires directly to research respondents through the *Google Form link*. Questionnaires that have been filled out by respondents are then tested for validity to ensure that the questions given are valid. The number of respondents is described in table 4. & 5. below :

Table 4. Types of Research Respondents

Types of Research Respondents	Number of Respondents	Total Number of Respondents
Male	14	25
Female	9	

Table 5. Results of Research Respondents

Position of Respondent	Number of Respondents
Management (Director / Deputy Director)	1
Head of Responsibility (PIC)	3
Manager	5
Staff	14
Total	**25**

b) Based on the questionnaire that was filled in by the respondent, a validity test was then carried out to ensure that the questions given were valid. The following results of the respondents' assessment are described in table 6. below :

Table 6. BPMM Assessment Results

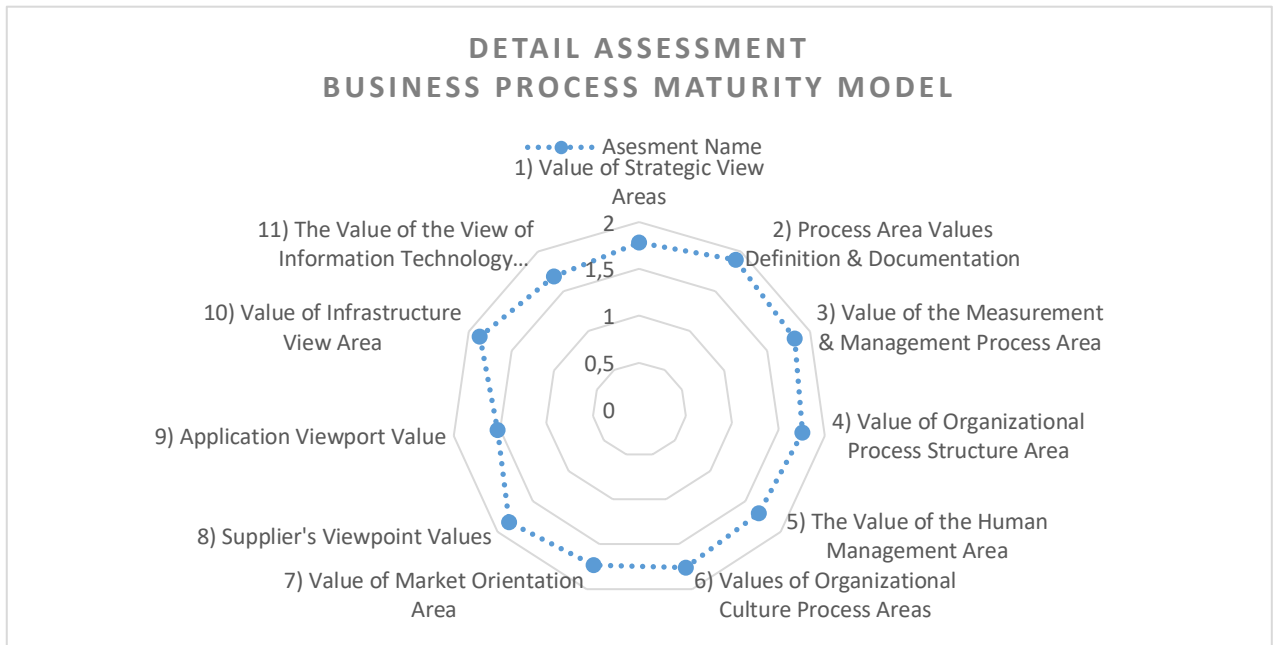| Name Of assessment	Total	Name of Mapping Assessment	Average Results
Business Process Assessment (Model)			
1) Value of Strategic View Areas	1.78	Business Process Readiness (Model)	1.58
2) Process Area Values Definition & Documentation	1.90		
3) Value of the Measurement & Management Process Area	1.82		
4) Value of Organizational Process Structure Area	1.76		
5) The Value of the Human Management Area	1.69		
6) Values of Organizational Culture Process Areas	1.76		
7) Value of Market Orientation Area	1.73		
8) Supplier's Viewpoint Values	1.84		
IT Application Readiness			
9) Application Viewport Value	1.53	IT Application Readiness	1.29
10) Value of Infrastructure View Area	1.87		
11) The Value of the View of Information Technology Resources	1.69		

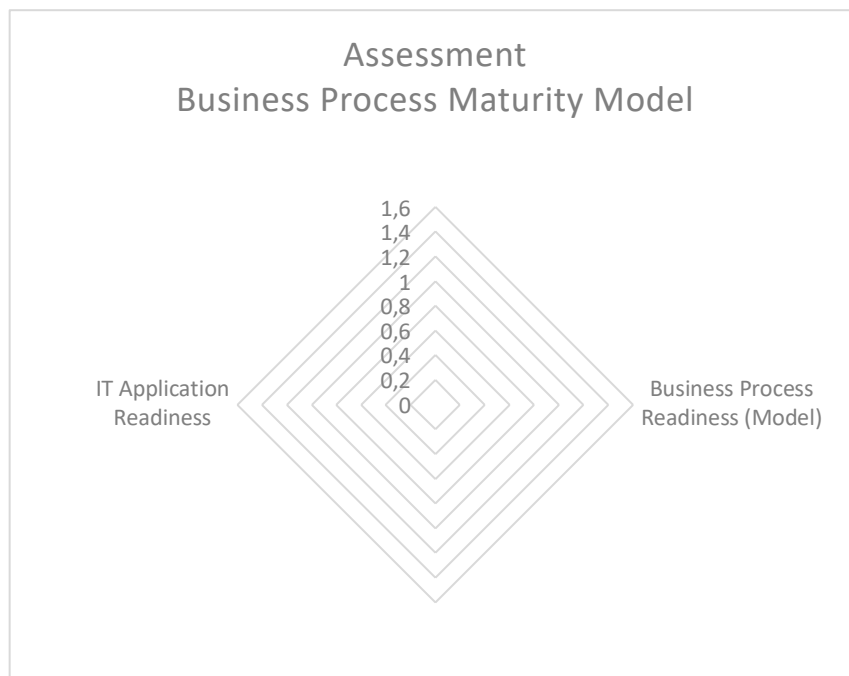**Figure 5. Detail Assessment BPMM**

Figure 6. Result Assessment BPMM

Explanation From Figure 5 & 6 : Conclusion of respondent data retrieval. This figure has a different value from the readiness of IT applications so that business alignment with the use of IT at Tiara Payung Putra has not been implemented optimally. Therefore recommendations will be made based on the results of the assessment in the form of a business model architecture planning proposal. The following are the results of the recommendations made, explained in the form of table 7. below :

Table 7. Proposed Architectural Concepts

Level Name	Description	Target Improvement
Current Business Model (Level 1 : Initials)	Ad-hoc	There Is Already A Business Activity But IT Has Not Been Run To The Maximum

Level Name	Description	Target Improvement
Proposed Recommendations (Level 2 : Managed)	Improvement of IT Management and Support Work Unit	1. Improved Organizational Business Activities 2. LPG Distribution & Monitoring 3. Measurement & Analysis of Business Activities 4. Management of IT resources

in table 7 are the results of the proposed business architecture concept recommendations, which are obtained after the data has been processed.

Proposed Recommendations for Business Architecture Planning

Based on the results of the research analysis and the results of the assessment that has been carried out, the following are the proposed business architecture concepts which are explained in Table 8. The business roadmap below :

Table 8. Roadmap for Proposed Architectural Plan Concepts

Architectural Proposed Category	Description	Target
Information Technology Architecture	IT Staff Recruitment	Recruit competent IT staff who are able to understand and manage Infrastructure and Information Technology at Tiara Payung Putra Company.
Information Technology Architecture	IT and Infrastructure	Have adequate IT resources that are supported by good infrastructure
Information Technology Architecture	IT Service Provision Planning	The plan to provide IT services must be supported by adequate resources such as: IT Users (People Who Have IT Knowledge), Software, Hardware and other supporting applications.
Information Systems Architecture	Information System Development Plan	Make an information system development plan, as for the system needed is as follows: a) Financial Management Information System b) Human Resource Information System (HRIS) c) IT Help Desk Service Application d) Inventory Control Management Information System e) Supply Chain Management System (SCMS) f) Customer Relationship Management (CRM)
Business Architecture and Information Technology	IT Management and Infrastructure	IT and infrastructure are integrated as a whole to business activities.
Business Architecture, Information Systems & Information Technology	Organization of Innovation and Application of IT Processes	Managed organizational processes so as to produce innovations such as policies, procedures, management and so forth, so that the application of IT processes can be applied as a whole.

Research Implications

Based on the results of research conducted shows that the use of business process maturity models can be used to measure company level. From this level of business maturity model, it can be proposed making business model architecture using the Enterprise Architecture Planning (EAP) method. the research implications are proven by the validation of data from business stakeholders in the TPP by producing a business architecture roadmap.

Conclusions

Based on the analysis that has been done, the final conclusions of this study are:

1. Based on the validation of the data obtained from the research data of respondents, the results obtained that the process of business process maturity model (BPMM) was successfully carried out and can be used as recommendations for business model architecture.
2. problem mapping in this research is done by Generating Business Architecture Targets obtained based on problem analysis and the gap analysis process.
3. This research results in a business mapping for the Proposed Architectural Plan Concept (Long and Short Term).
4. Research implications result in the utilization of business process maturity model methods that can be used as business model architecture planning, by producing a business plan roadmap.

Acknowledgements

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