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Analysis And Design Of Accounting Information System Database Of Werkudara Nirwana Sakti Co. Ltd

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Abstrak

Penelitian ini bertujuan untuk mengembangkan database sistem informasi akuntansi untuk siklus transaksi pendapatan dan pengeluaran. Penelitian ini merupakan studi kasus pada Werkudara Nirwana Sakti Co. Ltd., sebuah perusahaan biro perjalanan dan event management yang masih menggunakan sistem akuntansi non-database. Penelitian ini menerapkan kerangka kerja REA (*Resource-Event-Agent)* dalam pemodelan basis data. Basis data dikembangkan dengan menggunakan metodologi FAST (*Framework for The Application of Systems Technique*). Selain FAST, kerangka kerja PIECES (*Performance, Information, Economics, Control, Efficiency, Service*) juga digunakan untuk menganalisis dan mengklasifikasikan masalah yang ada di Werkudara Nirwana Sakti Co. Ltd. Penelitian ini merupakan studi kasus dengan menggunakan data yang diambil dari dokumen, wawancara, dan observasi langsung. Hasil dari penelitian ini adalah sebuah rancangan basis data dalam bentuk ERD (*Entity Relationship Diagram*) dan diagram REA yang disesuaikan dengan kebutuhan data dan informasi akuntansi pada Werkudara Nirwana Sakti Co. Ltd.

Keywords: *Resource-Event-Agent (REA), Framework for The Application of Systems Technique (FAST), PIECES, Accounting Information System, Database*

Abstract

This research is to develop an accounting information system database for a revenue and expense transaction cycle. This research is a case study on Werkudara Nirwana Sakti Co. Ltd., a travel agency and event management company which is still using a non-database accounting system. This research applies the resource-event-agent (REA) framework in database modelling. The database is developed using FAST (Framework for The Application of Systems Technique) methodology. In addition to the FAST, the PIECES (Performance, Information, Economics, Control, Efficiency, Service) Framework is also used to analyze and classify problems in Werkudara Nirwana Sakti Co. Ltd. This research is a case study using data taken from documents, interviews, and direct observations. The result of this research is a custome database design in the ERD (Entity Relationship Diagram) and the REA diagram those which are adapted to the need of data and accounting information in Werkudara Nirwana Sakti Co. Ltd.

Keywords: Resource-Event-Agent (REA), Framework for The Application of Systems Technique (FAST), PIECES, Accounting Information System, Database

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INTRODUCTION

The role of information system and technology increasingly dominate business activity. Gartner (2015) stated that the investment invested in IT sector in 2015 for the entire companies in the world that is as much as $3,8 trillion, increased 2,4% compared to in 2014 which is $3,7 trillion. The growth of investment in IT sector increased from 1,9% in 2014 to 2,4% in 2015. This shows the importance of information system and technology so that the companies made a large investment in this sector.

According to Elliot (1992) information technology has changed everything, including how to run a business. Information technology plays an important role for the company, especially in the development of accounting information system (Vaassen and Hunton, 2009). After computerized information system was entering corporate world, accounting grew quickly into a disciplined of information system (Suttonand Arnold, 2002). For example, the use of accounting information system could increase the quality and accessibility of accounting information (O'Leary, 2000), improve transaction process and allows a business to be more flexible in earning management (Brazel and Dang, 2008), as well as increase the quality of decision-making. In addition, the use of computerized accounting information system could also facilitate and accelerate data collection, accelerate closing of accounting period process, increase decision making, and increase the quality of financial statements (Kanellou and Spathis, 2013).

As for accounting information systems, database becomes a place to store transaction data and other information related to the company operations. A database application has a potential to increase the contribution provided by the accountant for an organization (Essex, 1997). Database technology provided efficiency in fulfill the needs of data and information for the company.

Werkudara Nirwana Sakti Co. Ltd. is a company engaged in travel agencies and event management sector. This company is still a growing company so that the accounting cycles that is run only for revenue and expenditure cycles. The uniqueness of this company's business process has resulted in the accounting information systems that will be used. Generic accounting application could not support the recording of transactions regarding the company's requirements. The investment decision for using customized application could not be done because it seems like the cost will exceeds the benefit. This caused the firm still used Ms. Excel to record transactions manually.

Utilization Ms. Excel in recording transactions manually is still not enough to meet the need of data and accounting information. The limitation of Ms. Excel is generating several problems for the business both on the revenue and expenditure cycles. On the revenue cycle, the problem arise is such as the difficulty of searching transactions with customers. This resulted in the billing process, the recording of cash receipts, and the process of recapitulation receivables. In the billing process, it could not discover whether customer orders is already issued bill or not. In the recording of cash, because of no integration with the billing sent, so that the process of recapitulation receivables is done manually and take a relatively long time. This could lead to double billing to the customers for the same bills.

Similar problems may occur in the expenditure cycle that is the difficulty in doing transaction search with vendors due to the absence of integration in the systems. The absence of integration resulted in receivable recapitulation manually. Error is very possible to happen on manual recapitulation, that is may occurs double payments to vendors for the same bill. Another problem of the use of Excel occurs when producing the revenue, expenditure, and income statements. The statements should be done manually, takes a lot of time, and have a high error risks. In addition, manually recording also gives the difficulty of information production such as history information with vendors and customers.

This study will analyze the need of data and information, and design the accounting information system using REA framework. REA database modeling is a framework

developed for modeling the accounting information system (McCarthy, 1982). This research will design the database that suitable with business process and easy to use that embodied in application forms. The use of REA in database design is expected to give alternative for the problems that may occur.

THEORITICAL REVIEW

Database

Database is a tool for storing data, and makes it possible to add, read, update, and delete data in a certain way (Stephens, 2009). Almost all applications used the database to store. The data is usually divided among multiple users. A database management system (DBMS) is software that was created to solve common problems in sharing data among multiple users and application (Post, 2011). The use of DBMS will provide efficiency in storing and searching data.

The database contains a set of data that have standard format designed for multiple users (Post, 2011). The use of database as a data storage provides several advantages, that is: (Romney and Steinbart, 2012)

1. Data integration
2. Data sharing
3. Minimize repletion and inconsistency of data
4. Data independence
5. Analysis of cross function
6. Enhance the security of data.

Useful data and information is important for management decision making. According to Romney and Steinbart (2012), there are seven characteristics of useful information, that is: relevant, reliable, complete, timely, understandable, verifiable, and accessible.

Entity-Relationship Diagrams

Entity-relationship (ER) diagram is a graphical technique that is used to describe the database schemes (Romney and Steinbart, 2012). This diagram may be used to draw entities or objects and their relationship, using the symbol (Stephens, 2009). Entity can be anything that its information can be collected and stored. The information that portrays an entity is called attributes.

Resources-Event-Agent Database Model

Resources-event-agent (REA) is a way to make a model of database. REA is a method to design database intended for designing data using REA was developed specifically for designing accounting information systems. REA provides guidelines to design a database to identify entity that should be included in the database of accounting information systems and prescribe the way to determine the structure of the relationship between entities in the database (Romney and Steinbart, 2012).

REA database model has a basic pattern to determine how the three types of entities related to one another. Basically, the three-basic pattern of REA are as follows (Romney and Steinbart, 2012).

1. Each event has to be connected with at least one resource that is affected by the event. Event will increase or decrease resources (Figure 1).
2. Each event has to be connected with at least one event to another. If there is an event that increases the resource, this even should be connected with at least one event that decrease others resources. (Figure 1).

3. Each event has to be connected with at least two participant agents. In each event should be at least two agents that participated in the transaction. For example, for transaction with external parties, there should be at least two parties, i.e. external and internal agent (Figure 1).

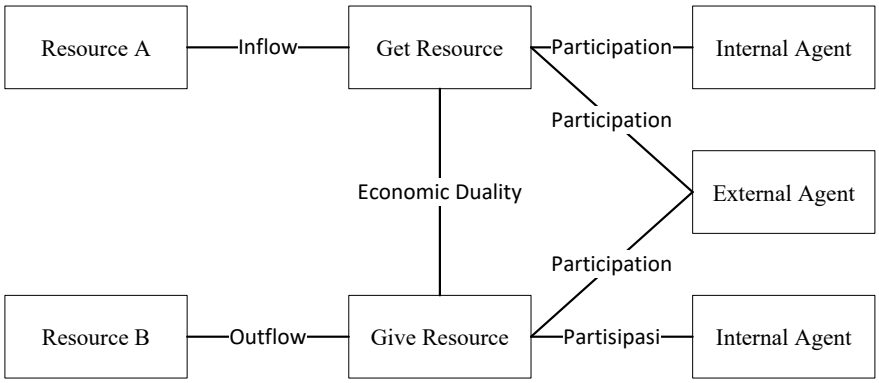

Figure 1. REA Template

Previous Research Related to REA

REA is a method of designing database that was developed to record economic phenomenon developed by McCarthy (1982). However, there is not many research related to the implementing of REA in database modeling. Vymetal, *et al.* (2010) was using REA in the modeling of business chain value as an alternative in modeling business process. Their research produced a business model that used a generic framework of REA. This model was converted into activity diagrams and sequence diagrams to achieve a dynamic overview of the REA. Their research showed that by using REA model transitions (dynamic), the consistency of the business process model could be achieved.

Business process modeling using REA was also investigated by Kasik and Hunka (2011). In their research, the modeling was done at the level of value system, value chain, business process, and tasks. The use of REA framework provided convenience for users, managers, and developers in understanding business process. Their research also support Vymetal, *et al.* (2010)'s on the use if dynamic REA framework that provided consistency to the REA model overall.

In contrast with Hunka (2011) and Vymetalet, *et al.* (2010), a research conducted by Batra (2012) focused on the development of REA model. More specifically, the notation of resource, event, and agent in REA was developed into Entity-Relationship Event Networks (EREN) model. EREN techniques can be used to identify event, describe a series of networking events, and develop a data model of business application by applying EREN on each event.

Research on evaluation systems based on REA conducted by Poels, et al. (2011). It was experimental research that focused on evaluating the benefits of REA modeling empirically. It was found that understanding about business process became more accurate if users read REA diagram. In addition, the impact on the modeling process is the use of REA may improve the results of system engineering needs and help to ensure the quality of the information system that was developed or implemented.

Research on the benefits of implementation REA in system development was also conducted by Laurier and Poels (2012). In their research, it was developed a reference model for the registration economic data that allowed tracking and tracing products and cash flows in registered data. This conceptual model was developed using REA framework embodied in the form of prototype application. This research showed that REA framework can be used to

connect the economic phenomenon and the summary of the transaction, so that it can be transformed to trace the flow of products and cash.

In contrast with Laurier and Poels (2012), Weigand and Elsas (2012) conducted a research about the benefits of using REA model in auditing. In their research, researchers studied the extent of REA meets the need of information in modern auditing. This research found that the constructs of REA was able to describe the risks and controls within organization. This research showed that REA supported auditing process and it can be integrated with auditing techniques.

System Analysis and Design

System analysis is a process outlining the system into sub-systems or smaller components (Whitten and Bentley, 2007). The basic purpose of the analysis process is to learn more about the system (Bagranoff, *et al.*, 2010). In the process of system analysis, we will learn how components in the system interact to achieve the goal, including the advantages and disadvantages as well as provide recommendations to improve the system.

The result of analysis process will be used in the system design process. System design is the process of reuniting the system's components into a complete system that has been repaired (Whitten and Bentley, 2007). The process of system design includes determination of output, processing procedure, and input for the new system (Bagranoff, *et al.*, 2010). The result of designing a new system will be used as a specification to build or buy a new information system. In this research, the methodology used to develop system is FAST (Framework for the Application of System Thinking) by using PIECES as a tool to analyze problems.

FAST (Framework for the Application of System Thinking)

Fast methodology is one of method used in the development of system. This method is integration from analysis and system design approach that can be customized to solve problems (Whitten and Bentley, 2007). This methodology is developed from combining the result of best practices that found in some commercial methodology. This caused FAST methodology is a flexible methodology to be used in several strategies and projects. FAST methodology is divided into eight stages (Whitten and Bentley, 2007).

1. Scope Definition
2. Problem Analysis
3. Requirement Analysis
4. Logical Design
5. Decision Analysis
6. Physical Design and Integration
7. Construction and Testing
8. Installation and Delivery.

PIECES Problem Solving Framework

PIECES problem solving framework is developed by James Wetherbe (Whitten and Bentley, 2007). This framework is used to classify problems, opportunities, and the new directive of a system. Each category is represented by a single letter of the word PIECES. The categories in PIECES are as follows.

1. P represents performance, is the need of improving performance.
2. I represents information, is the need of improving information and data. The needs of information and data can be seen in the terms of input, output and data storage.
3. E represents economics, is the need of improving economic, cost control and increase profits.
4. C represents control, is the need of improving control and security.

5. E represents efficiency, is the need of improving efficiency, both in process and users.
6. S represents service, is the need of improving service to customers, vendors, partners, employees, and so forth.

Each category in PIECES framework is not exclusive. One problem can be found into one or more categories (overlap). This framework is used to identify problems in the scope of definition phase of FAST methodology.

CASE STDUY RESEACRH DESIGN

REA Database Modeling

The method that is used to model the database conceptually and logically is REA. REA is designed to be used in recording economic phenomenon experienced by an organization. REA is used to model the data that consists of economic resources, economic events, and economic agents including the relationship between the three (McCharty, 1982).

In the design of the database, the tool that has been used is entity relationship diagram (ERD), a picture that showed the information created, stored, and used by a business system (Dennis *et al.*, 2012). In addition to display information, ERD also showed the relationship between one tables (entity) to another tables. ERD can be used to find information and how that information was organized and linked to one another. The steps of modeling using REA are as follows (Romney and Steinbart, 2012).

1. Identify the event.
2. Identify resources and agents.
3. Determine the cardinality of the relationship.

DATABASE ANALYSIS AND DESIGN

Scope Definition

In this phase, the main question must be answered is "Is this problem is worth looking at?" To answer that question, PIECES framework is used to analyze the problem. The result of the analysis and classification of problem are as follows.

1. Performance
   a. Response time – The time used to process transaction or request is relatively long.
2. Information
   a. Output:
      1. The lack of important information such as vendor transaction data, disbursement data, cost of service, cash receipt and payment.
      2. Sales report, expense report, accounts receivable report, and accounts payable reports are difficult to produce.
      3. The produced information is not in a useful format.
   b. Input:
      1. Data is captured redundantly. For example, the customer information of address, company name, and other related information should be inputted every time invoice is created.
   c. Stored data:
      1. Data is stored redundantly in multiple files or worksheet. For example, the information of customer and vendor are stored in more than one files or worksheet.
      2. Data is not secure, possible to be accessed by unauthorized user.
      3. Data is not flexible, is not easy to meet new information needs.
3. Economics
   a. Costs of services are unknown.

   b. Costs are not traceable to source.
4. Control
   a. Data is easy to be manipulated.
   b. Ethics are easy to be breached on data or information.
   c. Redundantly stored data is inconsistent in different files or worksheet.
   d. Processing error are possible to occur (either by user, machine, or software).
   e. Decision-making errors are occurring.
   f. The Bureaucratic slows the system. For example, all the payment done by the director.
5. Efficiency
   a. Data is redundantly inputted.

Above analysis showed that there are many weakness of the current system and it needs to be improved by developing database accounting system with REA to replace the current system, MS. Excel. The scope of this research is as follows.

a) This research only covered the analysis and design process of the database using REA Framework. This research didn't cover the implementation phase.
b) Regarding the resources and time, this research only covered the revenue and expense transaction cycle.

Problem Analysis

In analyzing the problem and opportunity, the initial problem may be only symptoms of another problems. Every identified problem will be analyzed the cause, improvement can be made, and the constraint (Table 1.

Table 1. Problems, Opportunities, Objectives, and Constraints Matrix

Cause and Effect Analysis		System Improvement Objectives	
Problem or Opportunity	**Causes and Effects**	**System Objective**	**System Constraint**
Transactions with vendor are not recorded properly.	The system does not support recording for purchase transaction. The system didn't use REA Framework.	Every transaction must be recorded (completeness).	The system must be user friendly. System/database must compatible with the operating system.
The purchase and sales transaction data are not related with vendor or customer.	The transactions are recorded with Ms. Excel (non-database) that doesn't support relationship. The system didn't use REA Framework.	Every sales or purchase transaction should be related to a vendor or customer. The data and accounting information are available for decision-making.	The database must support relations between table (relational database). System/database must compatible with the operating system.
Difficult in producing sales report, purchase report, cash receipt and payment report,	The transactions are recorded with Ms. Excel (non-database) that doesn't support relationship.	Using database modelled with REA to fulfill the need of data and accounting information.	The database must support relations between table (relational database).

and accounts receivable and payable report.	The system didn't use REA Framework.		
Information is not available in usable format.	The transactions are recorded with Ms. Excel thus require additional processing.	Information can be use anytime with no additional processing needed.	The data format is compatible with data processing software.
Information is not timely to its subsequent use.	The transactions are recorded with Ms. Excel (non-database).	Information and data are accessible anytime to support decision-making process.	Information is available in usable format. The data format is compatible with data processing software.
The data is redundantly recorded.	The transactions are recorded with Ms. Excel (non-database).	Data is stored efficiently – there is no redundant data.	-
The data is not secured, easy to be accessed and change without authorization.	The transactions are recorded with Ms. Excel (non-database).	The data and information can be accessed only by authorized user.	The new system or database should be able to prevent unauthorized access.
Lack of necessary information can be used in decision-making.	The transactions are recorded with Ms. Excel (non-database).	Every transaction must be recorded (completeness).	Information is available in usable format.
	Not all transactions are recorded to system. The system didn't use REA database modelling.	Information and data are accessible anytime to support decision-making process.	The data format is compatible with data processing software.

Requirement Analysis

The requirements should be meet by new database is as follows.

1. The use of database can increase efficiency in transaction processing.
2. Database is able to store all the transaction of Werkudara Nirwana Sakti Co. Ltd.
3. The database must have an adequate level of security to avoid unauthorized access.
4. The database is able to provide data and accounting information needed such as sales report, cash receipt and payment report, monthly transaction report, purchase and sales report, and accounts payable and receivable reports.
5. Data and information are timely to its subsequent use.
6. Data and information are accurate and free from error.
7. Data and information are complete.
8. Data and information can reduce the uncertainty, support decision-making, confirm and correct previous expectation.
9. Data and information are presented in usable and understandable format.
10. Data and information are not recorded redundantly.
11. Stored data and information are integrated between departments.
12. Database can be adjusted to meet future need of information and data

Logical Design

After analyzing the requirement, the logical design will be modelled. Use-case model diagram will be used to visualize the duty of system actor, the information generated by system, and the data that inputted to the system. The first step in making this diagram is to construct the actor glossary (Table 2).

Table 2. Use-Case Actor Glossary

Term	Synonym	Description
Accounting	Accountant	An individual that records cash inflow and outflow.
Marketing	Sales Person	An individual that sell services to customer and creates sales order.
Purchasing	Purchasing Employee	An individual that purchases office supplies and services for customer.
Management	Manager	An individual that monitors, directs, and controls company's operational activity.

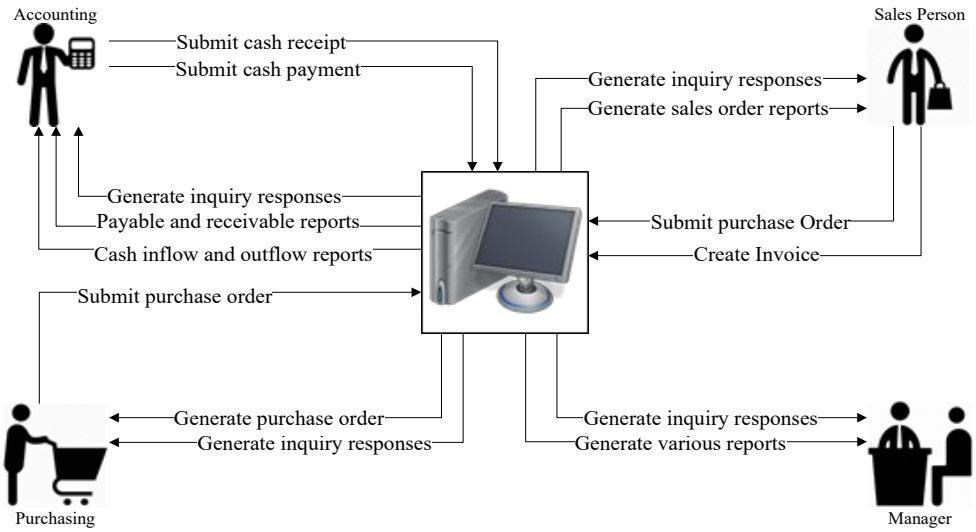

Figure 2. System Context Diagram

Use-case actor glossary describes the role of each actor in a system. The next step to use-case actor glossary is converting actor glossary to context diagram. Context diagram is a visualizing of the interaction between users and system (Figure 2).

Context diagram shows all the data submitted to and generated by database. Context diagram is helping in identification the actor in the system, how the system is used, and the scope of the system. This context diagram makes easier to construct use-case glossary (Table 3Table 3).

Table 3. Use-Case Glossary

Use-Case Name	Use-Case Description	Participating Actor and Roles
Input customer	This use-case describes the event when customer must be inputted first to the system before making order.	• Sales (primary system actor)

Submit sales order	This use-case descries the event when customer placing an order.	• Sales (primary system actor) • Customer (primary business actor) • Accounting (external server actor)
Revise customer order	This use-case describes the event when customer revising a customer order previously placed.	• Sales (primary business actor) • Customer (primary business actor) • Accounting (external server actor)
Cancelled customer order	This use-case describes the event when customer cancelled a customer order previously placed.	• Manager (primary system actor)
Input cash receipt	This use-case describes the event when the company receives cash from customer.	• Accounting (primary system actor) • Customer (primary business actor)
Revise cash receipt	This use-case describes the event when accounting revising a cash receipt previously submitted.	• Accounting (primary system actor) • Customer (primary business actor)
Input vendor	This use case describes the event when vendor must be inputted first before making purchase order.	• Purchasing (primary system actor)
Submit purchase order	This use-case describes the event when company places an order to vendor.	• Purchasing (primary system actor) • Vendor (primary business actor) • Accounting (external server actor)
Revise purchase order	This use-case describes the event when purchasing employee revising a purchase order previously placed.	• Purchasing (primary system actor) • Vendor (primary business actor) • Accounting (external server actor)
Cancelled purchase order	This use-case describes the event when company canceling a purchase order previously placed.	• Manager (primary system actor) • Accounting (external server actor)
Input cash payment	This use-case describes the event when company makes a payment to vendor.	• Accounting (primary system actor) • Vendor (primary business actor)
Revise cash payment	This use-case describes the event when accounting revising a cash payment previously submitted.	• Accounting (primary system actor) • Vendor (primary business actor)
Inquiry	This use-case describes the event when there is a request of information of receivables, payables, invoices, and product.	• Sales (primary system actor) • Accounting (primary system actor) • Manager (primary system actor)

Use-case glossary describes detail of activity related to the system. The next after creating use-case glossary is making use-case diagram. The information in use-case glossary will be converted to a diagram. This diagram is a visualizing of the activity in the use-case glossary (Figure 3).

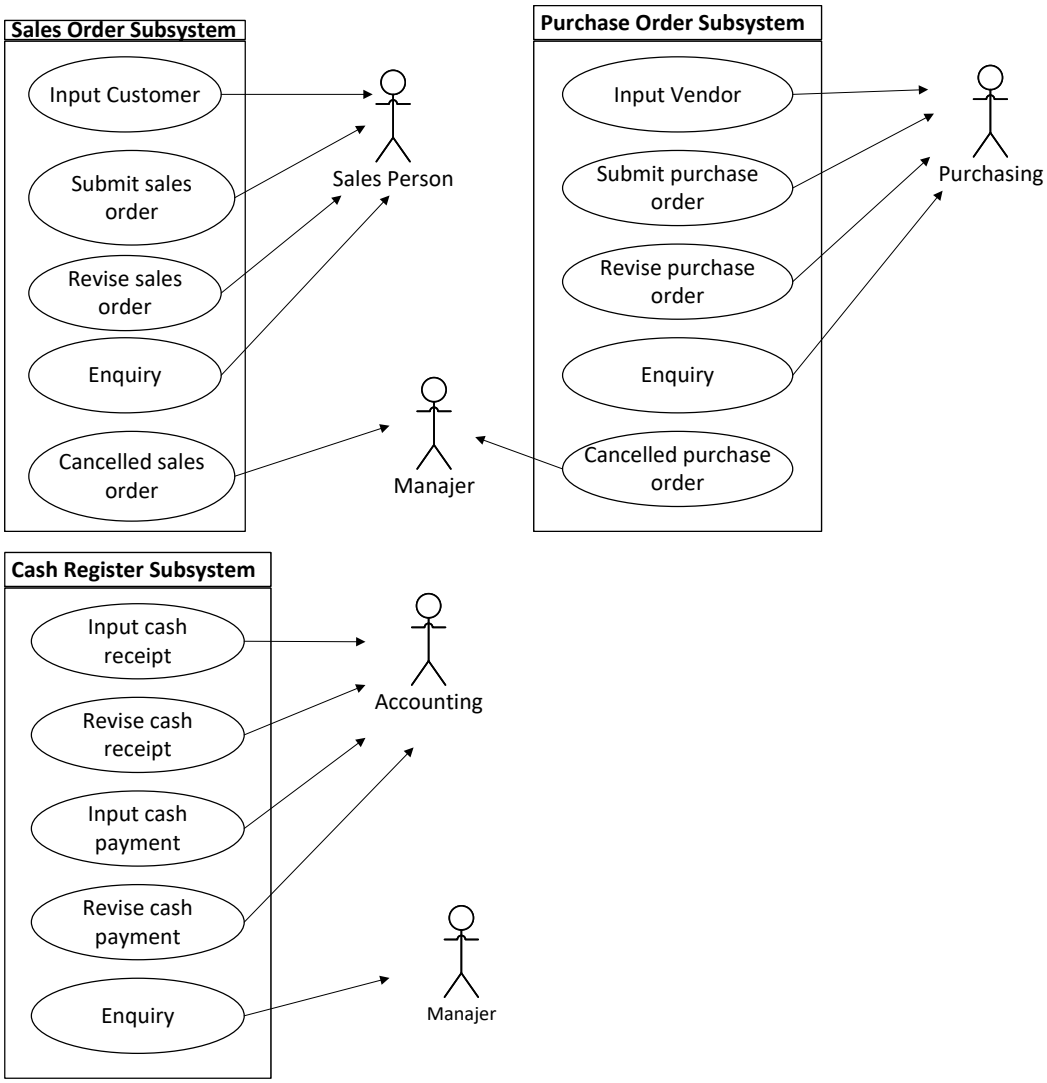

Figure 3. Use-Case Diagram

Designing Database with REA

The prerequisite step before designing REA diagram is to identify the business process. After identifying the business process, the next step is to determine economic events, economic agents, and economic resources for each business process.

Table 4. REA Database Components

Business Process	Event	Agent	Resource
Revenue Cycle	Take Customer Order	• Sales Person • Customer	Service
	Billing	• Accounting • Customer	Service
	Receive Cash	• Cashier • Customer	Cash
Expense Cycle	Purchase Requisition	• Purchasing • Employee	Supplies/Service
	Purchase Order	• Purchasing • Vendor	Supplies/Service

	Disburse Cash	• Cashier • Vendor	Cash

Table 4 showed all the REA components for revenue and disbursement transaction cycle. Above table showed that there are six event which should be included into REA diagram.

1. Taking customer order. There is no economic exchange in this event. This event is included in REA diagram because there is a commitment from customer to purchase. Besides, this event is essential in the sales transaction. In this event, there are two participating agents, customer and sales person.
2. Billing. There is no economic exchange in this event. In the business process of WNS Co. Ltd., payment must be made before processing the order. Invoicing result a liability for customer to make some payment. Besides, this company is using installment credit term, meaning that the amount of invoice might be different with the amount of sales order depends on the agreement. That is the reason this event must be included in the diagram in order to maintain the receivable records. The participating agents in this event are accounting employee and customers.
3. Receive cash. This event results in an increase in organization's supply of an economic resource with cashier and customer as the participating agents.
4. Purchase requisition. There is no economic exchange in this event. But, this transaction results an order to purchasing department to fulfill the requirements. This event is essential for the management in monitoring and controlling internal expenditure. In this event, the participating agents are employees and purchasing employee.
5. Purchase order. There is no economic exchange in this event. This event is essential because there is a commitment for the organization to purchase goods or service from the supplier. There are two participating agents in this event, purchasing employee and vendor.
6. Disburse cash. This event results in a decrease of economic resources. In this event, the participating agents are cashier and vendor.

The identification result of resources, event, and agent was converted to REA diagram. This diagram not only showed the resources, event, and agent, but also showed the cardinalities between entity (

Figure 4).

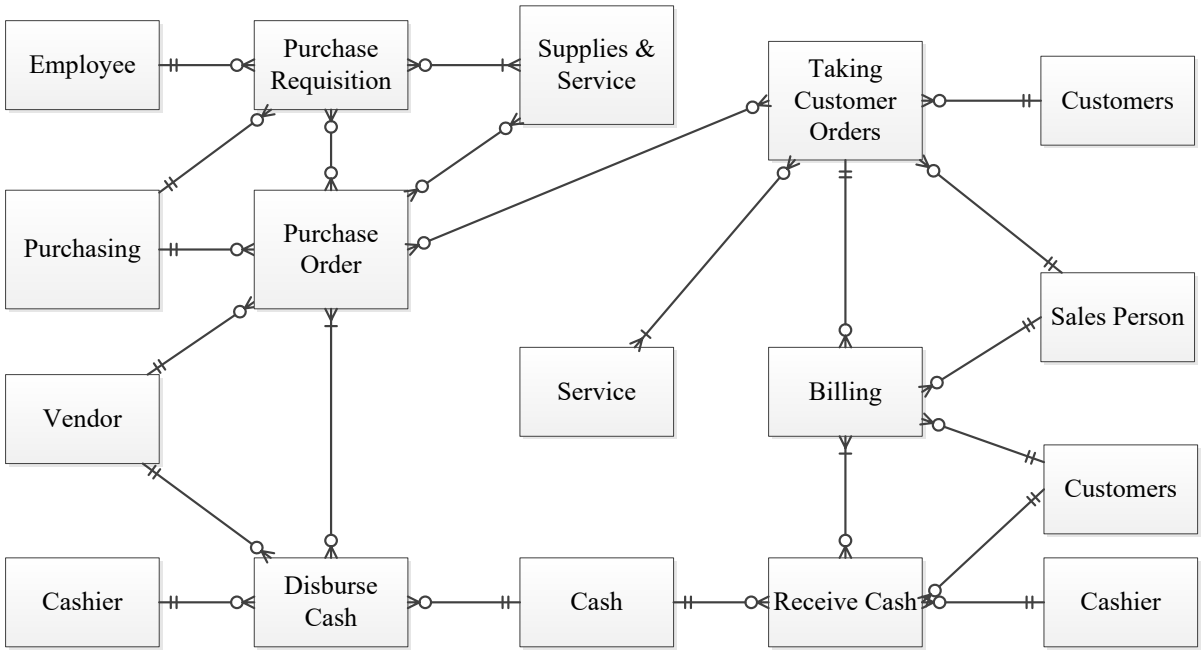

Figure 4. Diagram REA

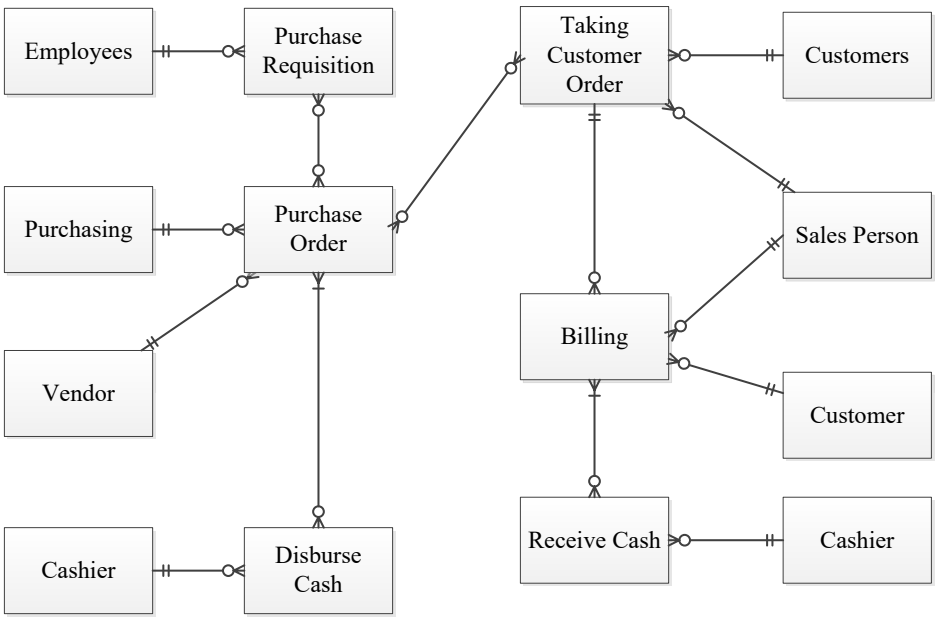

Figure 5. Non-REA Database Diagram

Figure 4 showed the relationship between REA components. This diagram will be the basis for identifying the attribute or field of any entity in the database. After all attribute are identified, the results will be translated into ERD (entity-relationship diagram).

ERD (Figure 6) described in a detail way how the entities (tables) are related one another. In this research, there is a comparison made between REA database and non-REA database (Figure 5 and Figure 7).

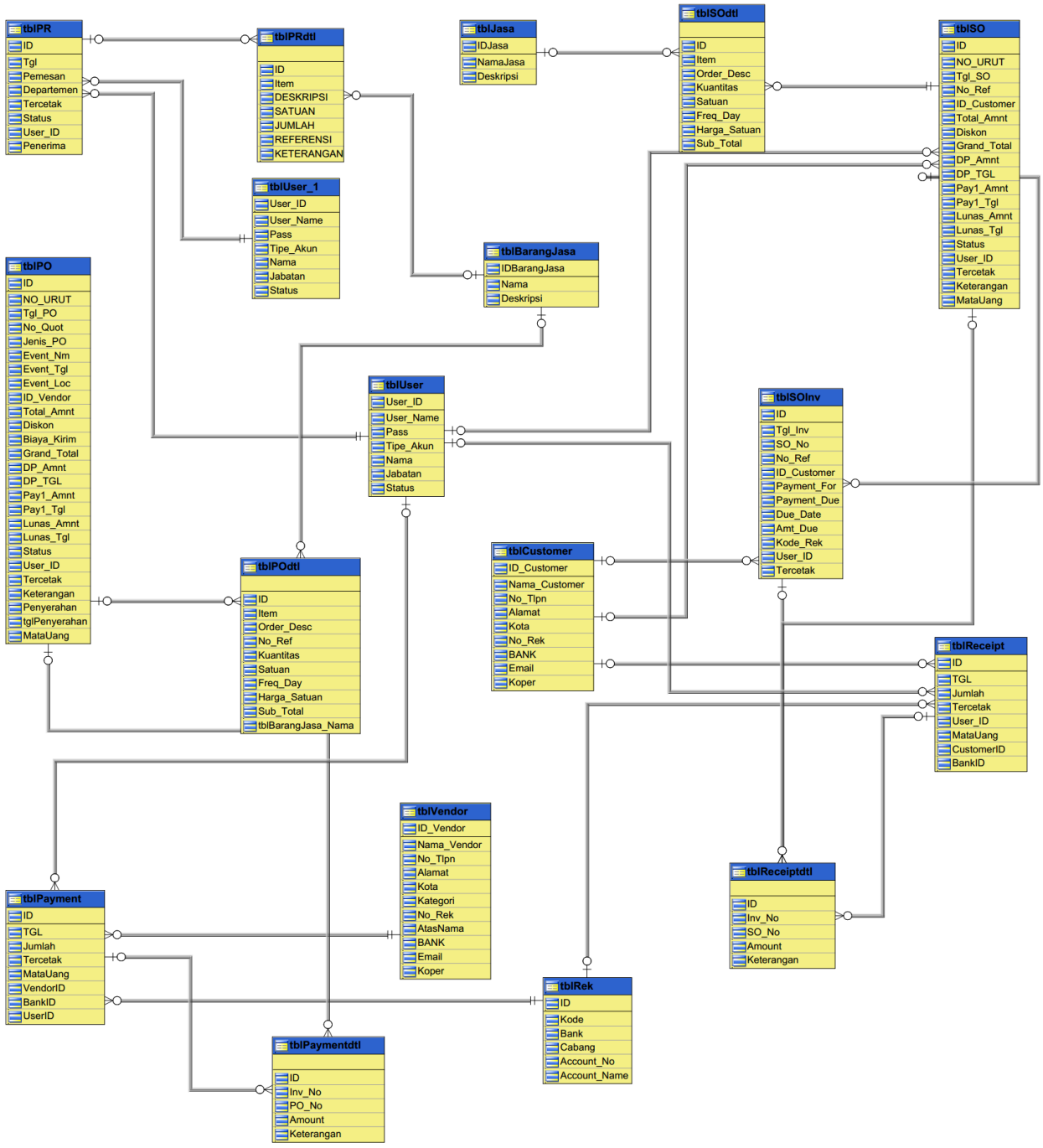

Figure 6. ERD of REA Database

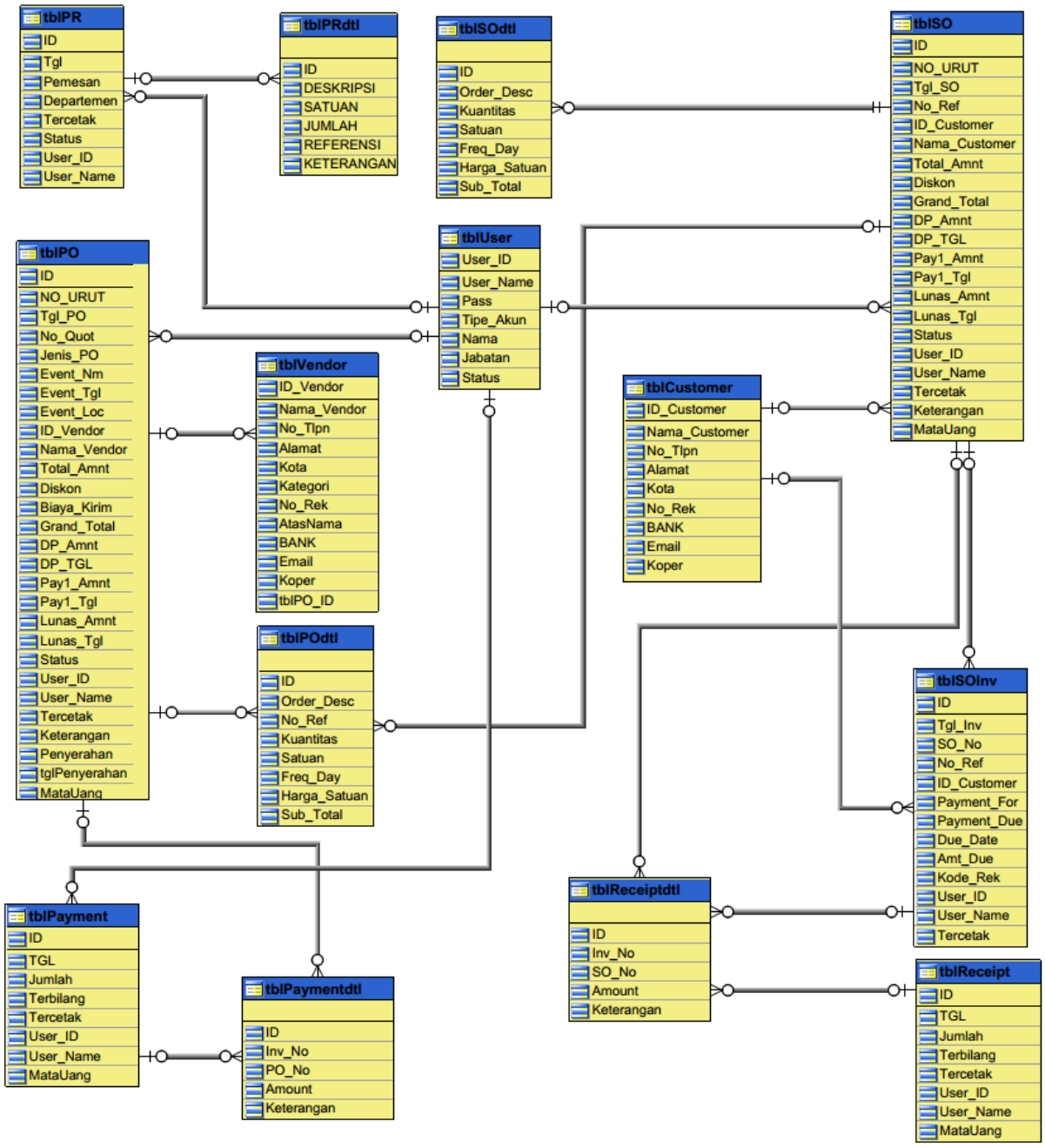

Figure 7. ERD of Non-REA Database

After ERD was finished, the next step is to design the report base on the need of Werkudara Nirwana Sakti Co. Ltd. List below is the reports that can be generated from REA database which is adapted to the need of data and accounting information in Werkudara Nirwana Sakti Co. Ltd.

a. Sales order Reports
b. Purchase Order Reports
c. Purchase Requisition Reports
d. Accounts Payable Reports
e. Accounts Receivable Reports
f. Cash Receive and Disburse Reports

Decision Analysis

There are several alternatives proposed in this research which can be applied to the company situation.

1. Developing database using REA framework in order to meet all required data and accounting information.
2. Developing database without using REA framework. The development time will be short but cannot meet all the data and accounting information needed.
3. Involving external software developer in building accounting system for the company. In this alternative, considering the company size, the cost of investment would be greater than the benefit receives from the system.
4. Keep using Ms. Excel in recording all transactions although the information produced is inadequate to support decision-making process.

From the alternatives above, the proposed alternative is to developing database using REA framework. This alternative is proposed with consideration of cost and benefit from the alternatives. Besides the low of investment cost, REA database could meet all the information needs. The produced information can be adjusted according to the changes of data and information needed.

Physical Design and Integration

In this phase, database will be design physically. In this research, the physical design phase includes designing the database structure and storage and determining the database system will be used. Regarding the company size and the number of transaction, this research used Ms. Access as the database system. After the database was designed and the application was built, an interview was made to several system users to know the response after presenting REA database and non-REA database. The summary of interview result is shown as per below.

1. Database with REA can fulfill the need of information that cannot be fulfilled by non-REA database, such as the summary of purchase order for each vendor and for each item.
2. Database with REA provides information more completely than non-REA database. For example, in non-REA database, there is no item in sales order, purchase order, and purchase requisition, only description of item that would be purchased or bought.
3. Database with REA supports tracing and tracking for all recorded transactions, such as cash payments and cash receipt.
4. Overall, database with REA can provide all the needs of data and accounting information of company, whereas non-REA database can only provide several data and accounting information needs.

CONCLUSION AND RECOMMENDATION

The database is essential for an accounting information system therefore, it must be modeled properly. REA database modelling enable the information system to produce data and accounting information completely. With REA, database is able to fulfill the need of data and information of company in supporting decision making process.

In addition to this research, there is a comparison between non-REA database and REA database. The non-REA database was made according to the manual system used by WNS. After interviewing several users, the result showed that overall database with REA giving more benefit to the business.

This research was conducted with the limited resource and time therefore this study has several limitations. The suggestion for future research are as follows:

1. Develop a database using REA not only in two cycles, but on the whole cycle of accounting transactions.

2. Extend the development to the implementation phase to obtain a more comprehensive research results. This can cover the changes in data and accounting information required after the design process.

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