BORANG PENGESAHAN STATUS TESIS

JUDUL: <u>AGENT-BASED SYSTEM FOR CLINICAL SUPPLIER</u>

SESI PENGAJIAN: <u>2007/2008</u>

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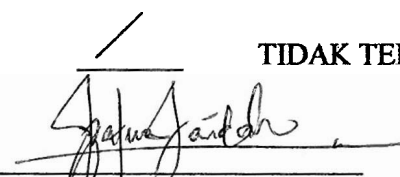
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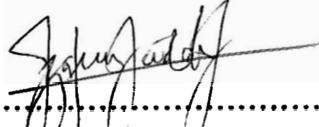^ Tesis dimaksudkan sebagai Laporan Projek Sarjana Muda (PSM)

DECLARATION

I hereby declare that this project report entitled

AGENT-BASED SYSTEM FOR CLINICAL SUPPLIER (ASCS)

is written by me and is my own effort and that no part has been
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DEDICATION

This thesis is dedicated to my family, friends and lecturers whom have taught me that everything is achievable as long as there are desires that burn inside.

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ABSTRACT

Agent-Based System for Clinical Supplier (ASCS) is a web based application that uses apache, MySql, and php scripting in its development. ASCS is designed for lab and clinical suppliers and health institutions such as clinic, hospitals and pharmacy. The ASCS provides suppliers to advertise their company and their supplies to customers in more efficient ways. The suppliers benefit the ASCS because they can be at the topmost if they have a well maintain performance in maintaining their supplying services. Meanwhile, as for the health institutions, they may search for lab and clinical supplies or supplier or obtain the best suppliers from the DSS element in the system. However, they have to take part in contributing to evaluate the supplier and their products by the rating process. Only registered users can access to ASCS to use the services provided in the system. As a conclusion, Agent-Based System for Clinical Supplier can be a reliable system for health institutions to seek for reliable suppliers in providing continuous well performance supplier's services when dealing with them. Besides that, suppliers may have chances to expand their supply chain management and businesses. Users are able to access the ASCS 24 hours a day anywhere and any time. The Agent-Based system for Clinical Supplier can be helpful for both help institutions and clinical suppliers to achieve their own objectives.

ABSTRAK

Agent-Based System for Clinical Supplier (ASCS) adalah sejenis aplikasi web yang dibangunkan menggunakan Apache, MySQL, serta PHP. ASCS direka untuk kegunaan pembekal barang makmal dan klinikal serta institusi-institusi kesihatan seperti kilinik, hospital dan farmasi. ASCS memberi peluang kepada pembekal untuk mengiklankan syarikat mereke beserta barang yang dikeluarkan kepada pelanggan dengan cara yang lebih efisien. Pembekal barang makmal dan klinikal mendapat faedah daripada ASCS dengan cara menjadi pembekal paling teratas jika mereka berkebolehan dalam membekalkan barangan dengan servis yang terbaik. Dalam pada waktu yang sama, institusi kesihatan boleh membuat carian pembekal atau barangan atau mendapatkan pembekal yang paling bagus terus daripada sisyem melalui elemen DSS. Walaubagaimanapun, pihak institusi kesihatan perlu mengundi pembekal dan barangan untuk proses pengundian. Hanya pengguna yang berdaftar sahaja yang dibenarkan untuk mengakses sistem ini. Konklusinya, Agent-Based System for Clincal Supplier mampu untuk menjadi medium bagi institusi kesihatan untuk menemukan pembekal barangan yang bagus untuk barangan yang mereka mahu. Selain itu, pihak pembekal juga berpeluang untuk memgembangkan bisnes mereka. Akhir sekali, sistem ini amat berguna bagi pembekal barang makmal dan klinikal serta pihak institusi kesihatan untuk mencapai objektif masing-masing.

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LIST OF ABBREVIATION

ASCS	--	Agent-Based System for Clinical Supplier
CSC	--	Computer Software Component
CSU	--	Computer Software Unit
DBMS	--	Database Management System
DSS	--	Decision Support System
ERD	--	Entity Relationship Diagram
GUI	--	Graphical User Interfaces
LAN	--	Local Area Network
MySQL	--	My Structure Query Language
OOAD	--	Object-Oriented Analysis and Design
PHP	--	Hypertext Pre-processor
PSM	--	Projek Sarjana Muda
RUP	--	Rational Unified Process
SSADM	--	Structured System Analysis and Design Method
UML	--	Unified Modeling Language

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CHAPTER 1

INTRODUCTION

1.1 Project Background

Supply Chain Management (SCM) is extremely important to the manufacturing and retailing industries. Profitability of companies in these two industries depends on the efficiency and effectiveness on they manage their supply chains. Information technology has been a key element in supporting supply chain management. As the access to the internet becomes easier, users are able to access real-time data and use decision support tools to support their decision making. With the enhancement of the blooming information technology development, agent-based system is founded to assist improving the Supply Chain Management. To implement the agent-based system, the agent technology is indeed to be applied. Agent technology is applied where an executable content serves the need of a client or perform a set of tasks on behalf of the client. In other words, clients do not need much effort in performing a task since an agent will solve it on behalf of the client.

Hence, with the blends of Decision Support System and agent technology itself, the Agent-Based System for Clinical Suppliers is crucial to provide better decisions for its users to obtain the best clinical suppliers and manage for the better supply chain. The target users for the systems consist of three parties which are the health organizations,

manufacturing organization and the administrator of the system. The users for the health organization are hospitals and clinics who make orders of clinical supplies to support their business needs whilst the manufacturing organization is the suppliers who provide those clinical supplies such as antibiotics, medical electronics equipment and the list goes on. In the other hand, the administrator is responsible to manage and handle the system to operate with error-free. The administrator has a full access to the system and has the power of controlling the other users' activities.

Since this project is a new system to be developed, there are several things that can be encountered by developing this project. Basically this system is based on agent technology and supports the decision making by implementing the DSS. This project generates knew knowledge about the significance of the agents and the DSS itself. The types of agents and approaches of the DSS can be discovered by core studies and continuous understanding about the related fields and topics. Therefore, this project gives the opportunity to develop a system that can provide improved services to its users. Besides that, the skills of software development can be applied during the development of the project. This is varied from the style of writing the codes to the implementation of the appealing views or the sense of the human computer interaction between users of the system with the system. Last but not least, this project provides chances to develop a web application that will satisfy its users regarding of its good performance.

There are several problems that lie upon the customers; which are the hospitals or clinics and also suppliers that invoke the needs of this system. The search process of suppliers involves manual business process which is very inefficient and ineffective. The procedures are time consuming and increase search costs. Moreover, the manual business process of searching for the suppliers does not promise customers to obtain potential and reliable suppliers. And as for the suppliers, obtaining a trustful good medium to expose their selves among their customers is a little bit constraining since there are so many suppliers competing to win customers.

This project which is the Agent-Based System for Clinical Suppliers provides solutions for the outlined problems by providing the Web-Based system that can automate the manual business process of searching for the suppliers efficiently which is way faster and more convenience. Secondly, this system will act as an agent and supports for decision making. Therefore, customers are able to rely on the system for suggesting them the most potential and reliable suppliers. Meanwhile, suppliers are able to expose their capabilities among its customers since the system will suggest the most potential suppliers with good performance to customers.

1.2 Problem Statements

By binding to the manual business process of seeking for the suppliers, customers find it is very inconvenient because it takes an amount of time to search for the customers manually from any across of the publishing or mass media materials that match with the items that customers want to order. This process will consume time and the search costs will increase simultaneously as the manual searching is still running. Even though customers will eventually obtain the suppliers for the clinical supply needs, however customers prone to face later problems such as delay time of the ordered items since customers are not acknowledged which is the best supplier to choose. Moreover, there are huge counts of the existed clinical suppliers and later increase the complexity to choose for the best supplier. As for the suppliers, competence among them selves cannot be avoided and they must compete to be at the topmost. Suppliers do not have a brighter opportunity to expose and introduce them selves to the customers. Having a chance to get publicized and well known among customers needs certain amount of time with addition of providing the best service to their customers. The traditional form of exposing them selves by commercializing them selves in any form of mass media communication takes step by step procedures and consumes time and money. Sometimes, some of the potential suppliers are "ignored" by customers since they do not sound convincing enough.

1.3 Objective

After collecting and analyzing the problems arise from the manual business process, several objectives of developing the Agent-Based System for Clinical Suppliers are identified which are:

1.3.1 To reduce customer's mental effort to search for the best clinical suppliers

Customers can search for suppliers that supply for the clinical supplies desired that is way easier and convenient using this agent based system that comprises of the DSS that supports for decision making. The system will seek for the best, suitable, reliable and most potential suppliers to suggest to the customers. Hence, customer will obtain the suppliers without high degrees of mental efforts.

1.3.2 To obtain the optimal costs of finding the supplier

Normally customers have to contact more than one supplier to assure that they provide the right supplies, supply the correct amount of products etc. Customers have to confirm everything is well plan to avoid later problems or miscommunications. The more assurance of the customers made between the suppliers, the more costly for the customers to spend for reaching the suppliers. In the other hands, customers can obtain the best and reliable clinical supplier suggested from the system that is changing according to time after time.

1.3.3 To reach the reasonable times spend for searching the best clinical supplier

The manual way to seek for suppliers is very tedious process. Customers have to spend an amount of time searching for the suppliers from the advertisements through

the newspaper or short listing several suppliers from the internet and contacting them before running negotiations with the suppliers. However, by using this system, the procedure to search for the best supplier is very less and simple because customers only need a few clicks through the Graphical User Interface (GUI) and the best suppliers will be decided and suggested by the system

1.3.4 To provide brighter opportunity and trustful exposing medium for suppliers

Advertising the suppliers to gain for customer's attention in any form of advertisements such as in the newspaper needs procedures to be taken, spend some money on it and patients to wait for the ads to be published and also wait for the customers to contact them. There are in some certain cases where the popularity of the suppliers are not at the satisfying average and suppliers will increase competency among other suppliers even though the "unpopular" supplier is able to give better service than other suppliers. This system provides better opportunity for suppliers to expose their capabilities to customers and those maintainable performances of suppliers will always get on the topmost since the system will suggest for the best clinical suppliers to the customers.

1.4 Scopes

This system is designed for the administrator who will manage the system. Other target users are hospitals or clinics or any other health institution to obtain suppliers in clinical supplies in a specific state in Malaysia. They are the customers that will use this system which is an open source or a Web-Based system and is used on Windows XP platform. Last but not least are the clinical suppliers who will supply their products to the customers. The system is being developed using the Object-Oriented

Analysis and Design Methodology (OOAD). The system's modules comprises of three main things which are:-

1.4.1 Login

The login module tells the system to which extend of the target users can manipulate the system. Administrator of the system can have a full access of the system and grant access to the customers or suppliers. Customers or suppliers are only allowed to do certain actions in the system as what have been permitted by the administrator. Customers and suppliers information will be kept in the database for reference and other tasks.

1.4.2 Clinical Supplies Searching Agent

This module ensure the search agent to enable customer searching for the types of the clinical supplies that they are interested in, where they have to make the type of supplies selections that is provided by the system. Supplies details are also available.

1.4.3 The Supplier Suggestion Agent

After customers have done the clinical supplies searching, the agent will persuade for the potential suppliers according to the supplies chosen. Foremost, the agent also helps customers to choose the best suppliers among other suppliers by suggesting the very best supplier according to its performance history etc. However, customers are free either to accept the agent's suggestion or choose another supplier.

However, not all of the clinical suppliers in a specific state will be publicized in the system after the search process, but the system only allows the registered suppliers

to be exposed to the users. This is to ensure security so that the suppliers are not frauds. Whilst the unregistered customers cannot do the search process but can only view the system.

1.5 Project Significant

1.5.1   Develop Self-Skills and Apply Knowledge

Full commitments towards this system's development is the critical contribution to the producing the high quality outcomes. Good interactions between supervisor and commitments to work plan will lead to the successful project task. The implementation of the knowledge is applied via this project. Furthermore, the skills of developing the project can be polished.

1.5.2   Provide Facilities to Customer and Suppliers

Customers can reduce cost and mental effort of searching for the clinical suppliers. The agent based technology system assists in searching for the suppliers and the DSS supports for decision making gives total convenience to customers whilst supplier can easily find customers that interested in their clinical supplies without sacrificing more time and money using the traditional way to obtain customers.

1.5.3   Implement Better Services

This system will give a better service for customer to find for reliable clinical suppliers according to the desired selection of the clinical supplies types. This system also promotes a reliable platform and trustful medium for customers to search for the

potential and best suppliers without any doubt. Meanwhile, suppliers have the better options to be in the centre of customer's demands because the system will present the actual topmost suppliers simultaneously as the time passes by.

1.6 Expected Output

At the end of the project development, a Web-Based application that implements the agent-based technology and DSS will be fully developed and operates its function successfully. The Agent-Based System for clinical suppliers will solve the problems of decision making for selecting the best potential clinical suppliers. It is hoped that this system promoted for better and faster communication between the customers and suppliers while eliminating the problems that will be encountered when using the traditional business process.

1.7 Conclusion

The Agent-Based System for Clinical supplies is mainly about obtaining supplies item in clinical field such as medications for hospital's and clinic's use. This system will use the system as an agent to support for the client's task, which is to find the suitable suppliers that may fulfill the hospital's or clinic's order's requirement. It also will use an agent technology in assisting and simplifying person-to-person communication for information gathering tasks, by just relying on the system to do the supplier finding job. It is an open source system that is a Web-Based system and can be accessed by health institutions which are normally hospitals and clinics to find for best clinical suppliers. The process of searching and obtaining the best supplier for the customers will be in convenience since this system provides Decision Support System; which means they will be given the best searched result instead of doing the searching task continuously or manually. Basically this Chapter One have discussed about Project Background, Problem Statement, Objective, Scope, Project Significance, Expected

Output and Conclusion. The Literature Review and Project Methodology will be discussed in the next chapter which is the Chapter Two.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

This chapter tells the reader in details about Literature Review and Project Methodologies. Literature review describes the background of the project proposed which is the Agent-Based System for Clinical Suppliers. Besides that, this chapter provides summary and evaluation of the previous research or work that is the same or related to the project which will be developed. The purpose of literature review is to justify the exact choices of research or a project. Secondly, it exposes the importance of the topic or the system to be developed. Next, in order to understand the project, literature review will assist to gather the background information needed. Apart of that, it functions as the key to show readers that the developer of the system is familiar with significant and the latest research that is relevant to the topic. Besides that, literature review provides chances to discover what has been investigated and what has not and also to discover how a project is related to the work of others.

Methodology is a method or process of activities that is used to develop system. Methodology has phases which crawls phase by phase to develop a system until it completely finished. Each step of this phase is shown by modeling it. Normally only the end goal of the process is manifested as a physical work product. In software, the analysis and design activities are normally governed by a specific methodology. There