BORANG PENGESAHAN STATUS TESIS*

JUDUL: SOFTWARE SYSTEM FOR MOULD MANUFACTURING WITH MOBILE TECHNOLOGY

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Saya SHARMINI A/P MOHAN

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Tarikh:

(TANDATANGAN PENYELIA)

En. Pn.Massila Kamalrudin

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SOFTWARE SYSTEM FOR MOULD MANUFACTURING PURPOSES WITH MOBILE TECHNOLOGY

SHARMINI D/O MOHAN

This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Software Development)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITY TEKNIKAL MALAYSIA MELAKA
2007

DECLARATION

I hereby declare that this project report entitled

SOFTWARE SYSTEM FOR MOULD MANUFACTURING WITH MOBILE TECHNOLOGY

Is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ Date : 12/11/2007
(SHARMINI A/P MOHAN)

SUPERVISOR : _____ Date : 12/11/2007
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DEDICATION

To my beloved parents, Mr. Mohan A/L Karappan and Mrs. Kalyani A/P Kuppan @ Balakrishnan, for their seems less expression of love and fully support…

To my supervisor, Mrs. Massila Kamalrudin, for making it all worthwhile...

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I would like to thank to my fellow friends for giving me full support and stand by my side whenever I facing problem. They are there all the time to help me to solve the problem or giving ideas to develop this project.

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ABSTRACT

This paper presents a system on the framework of a computational system for calculating mould cost estimation. The main purpose of this developed system is to develop a systematic injection mould cost estimation model, developed a computer based injection mould cost estimation. This is because to help the industrial language practitioner in producing accurate budget in manufacturing mould. The results of this framework will facilitated the planning of the manufacturing process and the development process of the computational system. In addition, this system is to help the system developer to bring up with good and accurate computational advance system for injection mould cost estimation.

ABSTRAK

Kertas kerja ini menjadi barang perantaraan untuk *calculate mould cost estimation.* Antara sebab utama system ini dibangunkan adalah untuk bangunkan satu system yang systematic untuk *injection mould cost estimation model.* Di samping itu, ia juga dibangunka untuk tujuan pembangunnan bagi *cost estimation for mould manufacturing* dalam komputer. Ini akan membantu dia membantu *industrial practitioner* untuk menyediakan satu platform untuk mengira bujet. Selain itu, system ini juga mambantu *system developer* untuk mendapatkan satu pengiraan yang sangat berkesan tanpa membuat sebarang kesilapan teknikal ataupun kesilapan biasa yang dilakukan oleh manusia biasa.

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CHAPTER I

INTRODUCTION

1.1 Project Background

Plastic injection on mould manufacture is a highly competitive operation. Reducing the mould design and manufacturing lead time while maintaining high mould quality is thus a challenge to the plastic injection mould making industry in order to remain competitive. Even though the prime function of the mould design satisfactorily to produce plastic moldings from the completed tool, it is clearly also paramount that the design adopted should be capable of economic and sound manufacture by the most suitable method and facilities available.

A mould is made up of a variety of plates, blocks and other shapes of metal. Mould designer usually does not select the molding materials but aware of the important aspects and characteristic involve in molding specific plastics. Some plastics will absorb and dissipate heat more efficiently than others, resulting in more efficient cooling during the molding process. The injected plastic is allowed to cool and solidify in the cavity. The process of making mould involves many individual activities especially cost estimators and parameters that must be tightly controlled to produce a high quality product at a reasonable cost.

The current major practices in many mould manufacturers companies are still depending on the experienced people in the making of quotation for their customer. Mould cost are often not computed at all but estimated based on experience or in comparison with moulds made in the past. They had to imagine the actual cost involved before they provide the estimation cost which involve various stages. The stages are in design, machining and assembly process. Sometimes they might provide a higher price in their quotation compared to their competitors. Thus this will let them lose the business. But if they provide lower price, they will lose in their profit. Based on Chan et al. note that underestimated quote will also become disaster to the mould manufacturers in term of manpower planning, delivery schedule and profits. In addition, it would be extremely time consuming and impractical if the mould maker use to calculate manually.

According to French et al. cost estimation is a typical example of a knowledge-intensive engineering task where classify the cost estimation process as a derivation task within knowledge-based systems design. Companies often hire professionally educated engineers to do the task, and those engineers typically require several years to develop expertise in performing this task. Estimators must recognize the design conditions of the facility design that are important and the way to affect the construction costs.

There are few software systems for calculating cost estimation in plastic injection mould which is available in market but only can install in computers. If the cost estimation for plastic injection mould install in personal digital assistant (PDA), it help companies to get the tender quit easily because cost estimators can calculate the price for mould immediately. A PDA allows the user to efficiently access, organize, collect, store and process various kinds of information and work with it on the run. Being a hand – held electronic device, it is designed to fit palm as easily as pocket size. Unlike an ordinary computer, it is always with user. This software system will code in JavaScript.

1.2 Problem Statement

Manufacturers may have some difficulties in finding commercial software for plastic injection mould cost estimation which really suits their immediate use. Some existing software in the market has many restrictions in data entry. Even though the software is easy to use, users require a long time to grasp and to modify the values of the difficulty levels of machining methods for precise cost estimation. They are time consuming for learning, not user friendly and the mould cost estimate is not accurate if users do not well understand the meanings for individual input (Chan et al.2003).

An empirical cost estimation method is generally used, which is regarded as a faster and more user friendly method. However, the empirical cost estimation method requires mould makers to memorize the detailed mould construction steps and tools materials. Occasionally when they forget some mould construction details, underestimate may occur which will affect the mould cost significantly. It is hard to remember all the calculation of mould cost estimations without the reference of handbooks. Without calculating the components' volume and density, it is difficult to know the weight of raw materials (Chan et al.2003). Theoretically, cost estimators who calculate mould cost manually to a very subtle detail may be able to obtain a precise and consistent result. However, it would be extremely time consuming and impractical. Cost estimators couldn't quickly compute the material cost and machining time directly from its database with known data of the product.

Understanding the building design construction costs is a challenging task for estimators. Estimators must recognize the design conditions that affect construction costs and customize the cost estimate accordingly. Estimators account for the cost impact of many design conditions by manually adjusting the project's activities,

resources and resource productivity rates that form the basis of a cost estimate for a specific design.

Then, if the design changes, estimators have to manually identify the cost information affected and adjust the activities and resources accordingly to remain the project's design and cost estimate in balance. Current tools and methodologies are unable to customize the project's activities and resources based on estimator's varied preferences and the particular design conditions in a given product model. Without automated support to customize construction cost information, cost estimators often employ ad hoc methods that are prone to error and result in inconsistencies and inefficiencies in the cost estimating process. For a large project, it is typically too time-consuming to perform all the project-specific adjustments of activities, resources and resource productivity rates for the different design conditions in a given product model manually (French et al.2003).

Online application have many things to take into attention especially security part. Security is one of the issues always being raised as an impediment to the progress of mobile agent technology. Nowadays hackers can hack the databases easily through online. Once the companies increase the security level of their databases, the hackers will find other method to hack it. Besides that, online application also open to spyware and viruses easily that can destroy the computer's OS system. If the server down, all the data that saved in database cannot retrieve. The user should wait until the server up again to continue their work. The saturation of network bandwidth and problems of server availability, particularly when part of the network in question is the internet, means that remote database access as required by the virtual enterprise model could mean ineffective IT support for the business. As well as data timeliness, factors such as data integrity and security are also a concern when dealing with the internet (Papaioannou.T.1999). Besides that, manual data entry makes data inaccurate and

increase data entry time. Mobile is a new technology that able to transport data from one host to another. Without mobile devices, the productivity are reducing through increasing of data entry efforts, increasing of data capture activities, disables process automation which decrease throughput and increase cycle-times (Oracle,2006).

1.3 Objectives

The objectives that going to achieve in this system is:

i. To develop software system to optimize the cost estimation problem in plastic injection mould. This system applies the parameter in plastic injection mould for cost estimation techniques. Besides that, it also taking consideration on mould base structure and manufacturing cavity and core. These considerations are taken in order to produce precise and consistence cost estimation for plastic injection mould.

ii. To assist industrial practitioner in estimating and understanding manufacturing budget. It provides industrial practitioners to get better view and understand on manufacturing budget. The industrial practitioners can use the system to produce an accurate budget for certain manufacturing projects.

iii. To assist students and lecturers in learning and teaching process. This computerized system will also act as an aided tool in learning and teaching process in Higher Learning Institution. It will help lecturers more competent in teaching and explaining about the cost estimation to their students. It will also

guide the students to explore and gain knowledge on conceptual to estimate budget in plastic injection mould.

1.4 Scope

There are three category of target user for this software system which first is the student because it can be as a learning tool for student to understand how the cost estimation for mould is done. Besides that, it also guide the students to explore and gain knowledge on conceptual to estimate budget in plastic injection mould. Second are lecturers because help lecturers more competent in teaching and explaining about the cost estimation on the cost of plastic injection mould. The third target user is the industrial practitioners or cost estimators because this software system can help them to calculate the mould cost estimation accurately. This software system also helps the cost estimators in their daily working life where it disburden the cost estimator from remember all the steps or the calculation of mould cost estimations.

There are two main modules in this system that is calculation for estimated cost for mould manufacturing and display graph for mould base calculation. For first module which is calculation for estimated cost for mould manufacturing, there are two part of calculation that is mould base calculation and another is calculation for cavity and core. For mould base, they calculate total cost for mould base. For cavity and core there is little different calculation with different formulas. First is mould base calculation that will calculate total cost of mould base. Second is cavity and core where there are few steps for calculation such as manufacturing cavity and core, manufacturing parting surface, total hours cavity and core and estimated cost for cavity and core

1.5 Project Significance

There are few benefits that a user can gain from this software system such as to optimize the cost estimation problem in plastic injection mould where it can produce precise and consistence cost estimation. Besides that, this system also assist industrial practitioner in producing an accurate budget for certain mould manufacturing projects. On the other hand, this system also can assist students and lecturers in educational process where help lecturers more competent in teaching and explaining about the cost estimation for plastic injection mould to their students. This system also can guide students explore and gain knowledge on conceptual budget estimation for plastic injection mould.

The usage of mobile devices results in improved data accuracy and increased mobility and convenience thereby streamlining movement and reducing human errors. Mobile devices increase productivity through reduced data entry efforts, reduced data capture activities, streamlined user time-motion efforts, enables process automation which increases throughput and decreases cycle-times. The user can access more information or can estimate the cost estimation for given mould model without having to change stations or work location. Users may complete distribution, manufacturing and quality transactions from anywhere inside or outside the plant. One mobile device can replace several desktop PCs. Mobile devices may be assigned to users significantly reducing dependencies on bulky desktop PCs (Oracle,2006).

By developing this software system, it is not complusory for the user to have an on hand mould making experience. Instead, users are recommended to have basic knowledge of plastic injection mould. They should know the mould building process from given product or drawing. This is because the user must be able to choose a suitable process and materials for a mould. Without correct input, an accurate result cannot be obtained. Besides that, cost estimators can quickly compute the material cost and machining time directly. It would be less time consuming and practically used without any imprecise and inconsistent results.

1.6 Expected Output

After the installation of this software system in PDA, it is already available for the user to use this software system. Once the users open the system, first screen will appear and the users need to input the required information to calculate the estimated cost for mould model that given by the customers. If the users want to view the graph for mould base calculation, they just click on the graph button on the bottom of the screen. All the data that the user input must be saved in database where the user must click on save button after input the required information.

For cost estimation calculation the user will take around 10 – 15 second to input the required information in each screen to calculate the estimated cost. It will take around 10 – 15 minutes to get the accurate estimated cost for mould model that given by the customers. Besides that, the data that saved in the database are only for short term saving because if data are saved for long term, the accessing process of the PDA become very slow. It because the data that saved in it make the memory of the PDA becomes

heavy. Once the calculations are finish, the users just close the screen by click on the 'X' on top of the screen.

1.7 Conclusion

As a conclusion, this proposes system will help the industrial practitioners especially cost estimators to calculate the cost estimation for plastic injection mould accurately. On the other hand, it also helps students and lecturers in educational purposes in calculating the estimation cost for plastic injection mould. Even though there are software systems for cost estimation in market nowadays, but it can only install in computers. Hope that this initiative way can be first steps for other to develop another cost estimation software system that can install in other new technology device such as in PDA.

The next chapter is literature review and methodology where it is important to the development process as the guideline to the developer. The method of develop this system are consist compatibility of step development that will done from preliminary until the end.