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MOLD AND DIE PROCESS PLANNING ACTIVITIES WEB-DATABASE

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**This report is submitted in partial of fulfillment of the requirements for the Bachelor of
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DEDICATION

**IN THE NAME OF ALLAH THE MOST GRACIOUS THE MOST
MERCIFUL**

Dedicated to

My caring and loving parent,
Mohd bin Muda and Mashayu binti Hj Abd Hamid
for all patient in growing and supporting me up

and for both my naughty little brothers,
ZulAfhm and Muhammad Fitri

Thank you for all the love, supporting, sacrifices and for having your faith in me.

May Allah S.W.T bless you in every way you done.

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ABSTRACT

Managing information of a company is very critical in order to ensure that the information could be use when the company needs them. The importance increase especially for a process planning activities manufacturing company where each product is unique thus having unique attributes. Therefore, this project highlights three main objectives - to define generic functional and information requirements for a mold and die process planning activities, to design and develop a database management system based on the mold and die process planning information model that has been developed and to help user to reduce the time that have been taken for each process in mold making. In this project, SSADM was chosen as the main methodology in modeling functional and information requirements of the company. For developing the system, most of the software used is open source software such as PHP Script, Apache Web Server and MySQL database. By using the open source software, total cost of software would be reduced. The deliverable outcomes of this project are the system will be a PC-based system which may in a network. Second outcome is the development of database management system (DBMS) to store information of process planning activities. Third outcome is the definition of generic functional and information model of process planning activities system. All the outcomes may act as references and guides in conducting future study.

ABSTRAK

Kepentingan menguruskan maklumat operasi sesebuah syarikat adalah amat kritikal bagi membolehkan sesuatu maklumat digunakan pada masa yang diperlukan. Justeru, projek ini meletakkan tiga objektif utama iaitu menjalankan kajian mengenai keperluan maklumat mengenai aktiviti perancangan proses bagi sebuah syarikat pengeluar acuan, pembangunan sistem pengurusan pangkalan data berkomputer bagi syarikat tersebut dan membantu pengguna mengurangkan masa yang diambil bagi setiap langkah perancangan proses. Dalam projek ini, SSADM telah digunakan sebagai metodologi utama untuk memodelkan keperluan maklumat syarikat disebabkan oleh beberapa kelebihan metodologi tersebut. Sementara itu, kebanyakan perisian yang digunakan untuk membangunkan sistem computer ini adalah tergolong dalam perisian '*open source*' iaitu PHP Skrip, Apache Web Server dan pangkalan data MySQL. Penggunaan perisian ini adalah bertujuan mengurangkan kos perisian. Hasil-hasil utama bagi projek ini adalah, system ini akan menjadi kerangka maklumat yang boleh digunakan secara '*online*'. Hasil yang kedua adalah, pembangunan pangkalan data bagi menyimpan maklumat aktiviti perancangan proses. Hasil yang ketiga adalah kerangka fungsian dan maklumat mengenai aktiviti perancangan proses. Ketiga-tiga hasil projek ini dapat digunakan untuk menjalankan kajian lanjutan pada masa akan datang.

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LIST OF ABBREVIATIONS

Abbreviations	Word
UTeM	Universiti Teknikal Malaysia Melaka
ERD	Entity Relationship Diagram
EERD	Extended Entity Relationship Diagram
DFD	Data Flow Diagram
PSM	Projek Sarjana Muda
DBMS	Database Management System
SSADM	Structured System Analysis Design Method

CHAPTER I

INTRODUCTION

1.1 Project Background

Mold and Die Process Planning Web-Database is an engineering process planning management system. This system will be build for manufacturing industry. It will use by mold making company which is provide the data and information needed. The company has a general system, but they still don't have a specific system for process planning activities. It's important to have own process planning system, because by the system, managers can know the duration time that will take for each mold making process. They are also can monitor the responsible staff for each process indirectly. This system will cover the entire schedule for each product that customer needed. Besides that, the system also can establish the quality plan for each product, plan tooling, plan material requirements and establish the manufacturing plan and control. So by using this web-database, they can record the data and all the process planning for each product effectively because it provide the basic process such as insert, delete, save, report, update and calculate the duration time will taken for each process and the whole process. Effective process management system allows the users to have the strong selling products and it also helps identify slow moving products so the user can reduce the cost associated with being "stuck" products no one wants.

1.2 Problem Statement

The problems had encounter in current system are:

- The problem in mold making is competition. Mold making is a very competitive industry. The impact of information technology has made the competition becoming more complex. Therefore, to win market share, manufacturers should try to shorten time-to-market and introduce new product as soon as possible.
- Mold making processes have the characteristic of job shop type of industry where orders are in limited quantity, no two orders are the same, production process is very slow and could be very complex. The complexity is due to the variety of parts, materials, machines, machining operations, process routes that are different for each product.
- It's also weak to trace the real duration time have taken for each product making process. As we known, time is very important in manufacturing process.
- Therefore, all of the information should be managed as efficient as possible.

However, the problem faces by those systems are not available cheaply. Therefore, there is a need to come up with information system to assist companies who need to manage information for mold making.

1.3 Objective

The main objective of this system is to provide database that suit process planning activities for mold and die. In short objectives of the project are:

- To define generic functional and information requirements for a mold and die process planning activities.

- To design and develop a database management system based on the mold and die process planning information model that has been developed.
- To help user to reduce the time that have been taken for each process in mold making.

1.4 Scope

The scopes of this project are as follow:

- The system will be a PC-based system which may work in a network
- The point of view of this study starts from the system level to the information level. Therefore, it will consider all of the information requirements for Mold and Die Process Planning.
- Mold making processes planning will be modeled using case study company and user for this system are employee that had to involves during the process planning activities such as designer, tool engineer, process engineer, manager and others.
- All the design for mold model can be view from this system.
- The modules that will be including in this system are System Administration, Process Plan, Tool and Quality Plan, Drawing Design and Process Report.

1.5 Project Significance

This system is a new web-database for mold and dies process planning and it provides a lot of benefit to the staff manage in the mold making process. In this system, users just need to key in the data and continue to do their job as fast as they can. By using this system, manager directly can monitor and calculate the duration times they

have taken to finish a complete one mold that client want. Company also can reduce the duration time and make the process management more efficient and smooth.

The staff that involves in process planning also do not have to worry about the human mistakes during data entry process because by using this system, user does not take to much time to record all the data and can spend a time to do others related job. Moreover, processes to access the data are more easily than before because it only used one database through online and it will create effective services to the user.

1.6 Expected Output

As a web-database, this system should be running online and make sure all the data that will key-in by user can be storage in the database and also more secure. To make sure the system can provide an effective application to the user, it must achieve the main process of the system such as insert, delete, update, save because if all of these functions are not working properly it means the system are not really achieve the goals for develop this system. The other output which is, the system can provide the calculation of duration time the whole process for each product or mold making. Besides that, the system also have barcode reader which is provide to separate the duration time by each process step by step because all the making process are not have the same expected time. Hopefully this system can provide the smooth process management for each that were produce by the manufacturing company.

1.7 Conclusion

As a conclusion, by using the system company does not have to take so much time to do all the mold making process. By that, they can compete others production in produce the product and at the same time they will keep the data in secure database. This system also will provide all kind of features to help them to solve the existing problems and ease user especially during managing the process planning. So, it will reduce time consuming and make the job are more efficient.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

In terms of a literature review, "the literature" means the works that consulted in order to understand and investigate the research problem. Literature study is important for ensuring the project will be developing is reliable and more meaningful. Literature review is searching, collecting, analyzing and drawing conclusion from all debates and issues raised in relevant body of literature. Literature review also implies and it makes use of other people work and the report must be able to demonstrate the past study related to the topic of the project and it also must be able to come up with a propositional solution (hypothesis) to the problem.

In project methodology, it will explain about the way to use all the available technique, tools and approaches used to achieve predetermined objectives. It also can be demonstrate an awareness of the methodological tools available and understanding of which suitable for the project.

2.2 Facts and Finding

There are some reasons that cause the development of the system to solve the existing problems. The sources for the finding in this topic can be found from the internet, articles from the magazines and books. Then, the literature review can be complete through extraction, analysis and drawing the conclusions from the sources. During this review, it evaluated the physical and internal controls over the mold making process planning. Academicians and industrial practitioners had classified all of the manufacturing process into some classes based on the generic functions and characteristics own by the process and product produce.

According to Harrington (1984), manufacturing is the conversion of naturally occurring raw materials into desired end-products. In the broadest sense, manufacturing begins with the acquisition of raw materials, and extends throughout the whole gamut of activities of production to the distribution and if necessary, the maintenance of the end products.

Addressing the utility of manufacturing process planning in general, Feng and Song (2000) noted that process planning is an activity of accessing the manufacturability and estimating the cost of conceptual design in the early product design stage. Depending on conceptual product information, such as material, form, structure and tolerances, primary manufacturing processes are selected, such as casting, forging, molding and machining. The activity also includes the subsequence of processes to complete the manufacturing of product.

Over the past decade, increase variety of products has become a driving force for manufacturers to develop new manufacturing paradigm for cost effective product differentiation (Brown, 1992). This requires an integration of manufacturing functions and product strategies to enhance business capabilities (King and Teo, 1997).

According to Brown (1996), there are five major classes of process choices:

- i) **Project**

The nature of these products is large-scale and typically complex. Projects tend to be one-offs. In manufacture, this includes such products as aerospace engineering, civil engineering and some high-tech project; flight simulator. The distinguishing feature between project and job shop is that the process of completion the product in project manufacture tends to be fixed.

- ii) **Job shops**

Job shops are use for one-off or very small order quantities requirements. Range of product variety is very high. Typically operate by highly-skill labours and use general purposes machines. Examples of products made by job processes are machines, prototypes, mould, tools and fixtures.

- iii) **Batch**

Main characteristics of batch production are medium volume production runs of a medium range of products. It is defined as the production of a product in small batches or lots by a series of operations where each operation typically being carried out on the whole batch before any subsequent operation is started. This type of process practically use in automotive industry and in producing some of consumer gods such as clothes, book etc.

- iv) **Line / Mass Production**

The major characteristics of line / mass production are large volume production runs of relatively few products. All products are highly standardized. Production facilities consist of highly specialized and dedicated machines.

v) Continuous

The process can theoretically run all day for each day. Productions are in very high volume and processes are dedicated in making typically only one product. A chemical refining plant is one of an example that use this type of process.

As we can see, many authors stated that manufacturing needed the comment intelligent interface for each manufacturing application program. Almost all users demand simple and easy-to-use systems to avoid spending extra time and money in training themselves learning how to use a system. Therefore, ease of use of a system should be considered when planning and building the process planning activities system.

2.2.1 Domain

The domain for this system is more to manufacturing process management system. It's a collection of technology and methods use in manufacturer of product especially for mold and die making process. To produce a better product, it's important to manage the schedule when to making the product because scheduling is one of important tool in manufacturing management, where it can have a major impact on the productivity of a process. By scheduling, company can manage the process planning activities to achieve the target when their produce some product .For applying the system in process planning activities, it will take a time to understand the flow of mold processes.

2.2.2 Existing System

Nowadays, there are many types of system or applications were created that involves with the manufacturing process management to ease users for doing their job.

Each of the manufacturing process system has different kind of functions, process, and requirements, based on user needs. There are a number of recent studies done in mold making and job shop system. However, as far as this study is concerned, none of them tried to balance between the needs of job shop system and mold making process.

The examples for existing system are:

a) Information Requirements for Mold Making in a Job Shop Manufacturing System.

This system is focus on general manufacturing process but not in the process planning management, where the system will cover overall of the mold making process from customer order, design, mold plan, costing, purchasing, manufacturing, raw material inventory and shipping. All of the basis and important functions was provided in this large system. However, it didn't provide process planning activities to the user to check whether the process planning of the mold making successfully manage on time.

This system is used open-source software such as MySQL, Apache Web Server and PHP Scripting Language.

b) Gan and Lee (2002) from National University of Singapore had developed a system consists of three modules. The modules contain in the system are:

i) Process Planning

The process planning is the entry point of jobs into the system. Its purpose is to determine and input process plans for a particular job into the system.

ii) Job Management

The job management section keeps track of all the jobs in the system. Its update accordingly when a new job is entered, finished, or partially finished. The job management also triggers scheduling whenever a new job is entered, when there is a