DEVELOPMENT OF AN AUTOMATED SELECTION SYSTEM FOR CUTTING TOOLS AND MACHINING PARAMETERS OF MILLING OPERATIONS

By

GOAY LAY NEE

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirement for the Degree of Master of Science

August 2005

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

DEVELOPMENT OF AN AUTOMATED SELECTION SYSTEM FOR CUTTING TOOLS AND MACHINING PARAMETERS OF MILLING OPERATIONS

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August 2005

Chairman: **Associate Professor Napsiah Ismail, PhD**

Faculty: **Engineering**

This project deals with development of a cutting tools and machining parameter selection system for milling processes and named TnP system. The developed system has been divided into six modules. The first and second modules are concerned with blank and machine selection. The third module deals with feature descriptions with some basic dimensioning functioned as input to automate operation selection in the fourth module. The fifth and sixth modules are regarding the cutting tools selection, cutting parameters selection and generation of process plan sheet.

The whole system is developed by using Visual Basic.net as Graphical User Interface (GUI) and Structure Query Language server (SQL server) as supporting data storage and retrieval system. The integration of user interface and database has been implemented using program coding written in Visual Basic.

The specialty of the developed system is that it automates the selection of cutting tools and cutting conditions of milling operations. In addition, the user or process planner is able to modify and enhance the generated result from the system to meet their individual requirements. A test run has been included to demonstrate the potential and application of the developed system.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

REKACIPTA SISTEM PEMILIHAN MATA ALAT DAN PARAMETER PEMOTONGAN SECARA AUTOMATIK UNTUK OPERASI PENGISARAN

Oleh

GOAY LAY NEE

Ogos 2005

Pengerusi: **Profesor Madya Napsiah Ismail, PhD**

Fakulti: **Kejuruteraan**

Projek ini melaporkan kerja penyelidikan mengenai reka cipta sistem pemilihan mata alat dan parameter pemotongan untuk operasi kisaran dan sistem yang dihasilkan diberi nama "TnP system". Sistem yang dibina boleh dibahagikan kepada enam modul. Modul pertama dan kedua adalah berkaitan dengan pemilihan blok logam sebagai bahan mentah serta pemilihan mesin. Modul yang ketiga adalah mengenai dimensi asas bagi reka bentuk komponen yang berfungsi sebagai peransang untuk mengautomasikan pemilihan operasi dalam modul yang keempat. Modul kelima dan keenam adalah mengenai pemilihan mata alat, butir-butir pemotongan dan penghasilan helaian.

Keseluruhan sistem direkacipta dengan menggunakan program “Visual Basic.net” sebagai interaksi pengguna dengan komputer (GUI) dan bahasa komputer “Structured Query language server (SQL server)” sebagai simpanan dan pencarian data sokongan sistem. Perhubungan dan interaksi antara pengguna dan simpanan data-data dalam SQL dilaksanakan dengan kod-kod progam yang ditulis dalam “Visual Basic”.

Kelebihan sistem yang dicipta adalah ia berkemampuan melaksanakan proses pemilihan mata alat dan keadaan yang diperlukan dalam pemesinan secara automatik untuk proses-proses kisaran. Tambahan pula, pengguna atau perancang proses dibenarkan untuk menguabahsuai keputusan yang dibuat oleh sistem demi memenuhi kehendak individu. Satu uji pandu telah dilaksanakan dan dilaporkan dalam tesis untuk menunjukkan potensi dan penggunaan sistem yang dicipta dalam perancangan proses berbantu komputer.

ACKNOWLEDGEMENTS

This research is completed by effort of many whom have contributed to this work either directly or indirectly. I would like to express my appreciations for those giving the supports, guidance, advice and cooperation.

First of all, I would like to take this opportunity to express my appreciations to my project supervisor, Associate Professor Dr. Napsiah Ismail. Her guidance and advice throughout this research has been very inspiring and indispensable for the success of my research. Besides, I would like to take this opportunity to send my deepest gratitude to Professor Dr. A.M.S. Hamouda and Associate Professor Dr. Wong Shaw Voon for their invaluable comment and guidance throughout the research and in the thesis writing.

Also, I would like to express my appreciations to Sum Hing Enginering Works Sdn. Bhd. for providing me some resources of cutting tools to complete the research. Besides, I would like to thank to my friend Mr. Fu Ven Yi, System Analyst of Western Digital, without his advice and help, this research is not possible to complete.

And not forgetting to express my grateful to my family for giving fully support and encouragement. Last but not least, I would like to thank my husband, Mr. Low Chee Chong for his untiring support and concern throughout the years of my study.

Thank You

I certify that an Examination Committee met on 19th August 2005 to conduct the final examination of Goay Lay Nee on her Master of Science thesis entitled "Development of an Automated Selection System for Cutting Tools and Machining Parameters of Milling Operations" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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This thesis submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee are as follows:

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DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or currently submitted for any other degree at UPM or other institutions.

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GOAY LAY NEE

Date:

TABLE OF CONTENTS