

**Mobile-based Recharging System for Printing Services based on  
Multi Agent Systems (MAS) for UUM Students**

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**UNIVERSITI UTARA MALAYSIA**

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# **Mobile-based Recharging System for Printing Services based on Multi Agent Systems (MAS) for UUM Students**

A thesis submitted to Graduate School in partial fulfillment of the requirements for the degree Master of Science (Information Technology)

Universiti Utara Malaysia

By

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## ABSTRACT

Nowadays, mobile and web application have growth rapidly due to the current enhancement and development in the communication sectors. UUM is facing a lack in implementing and deploying the modern techniques for certain services such as recharging services, mobile banking application, and Web/WAP services, moreover, the current system for proving UUM student with the printing services is facing a difficulties to reach the students satisfaction which it's done by manual system and closing in a certain time. Otherwise, UUM students need to wait for long time till he/she get to use this service. Hence, this study proposes the using of Multi Agent Systems for simplifying and customizing the recharging process for the printing services over web and WAP application. Agent system has be used for classifying the client queries during the recharging process by converting the incoming signals to more understandable objects which reduce the lacks and mistakes during the recharging performance for the printing services. The study has been employed the research methodology based on object-oriented analysis and design by Whitten and Bentley (2007) that involves the use of RAD methods for system design. The system has been tested and evaluated based on test case method.

## DEDICATION

*Firstly, I would like to dedicate this work to the good pacemaker; who taught us to keen to seek the knowledge, our Prophet Muhammad (peace upon him).*

*I dedicate this humble work to my beloved father and mother; the spring of loyalty, affection, and dedication. They raised me on the principles of virtue, to my dear sisters, to my grandmother soul and to who had always encouraged me to knowledge and studying my dear grandfather Prof. Dr. Affif Abdelrahmann.*

*I dedicate this work also to my cousin Ayman Abu Alhayjaa "Abu Saad".*

*I am also expressing my great thankful to all my colleagues and friends at UUM, for their support, with whom I shared pleasant times, and all my family members for their encouragement and support all the period of my studying, and to my ABU ALHAYJAA family.*

*Your Son:*

*Sami Abu alhayjaa*

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**SAMI ABUALHAYJAA**

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# CHAPTER ONE

## INTRODUCTION

This chapter elaborates the main idea of this work, why the study was conducted and what is the main element involved in the study. The first sub-topic describes the overall idea in this study through the scenario and motivation that lead to the implementation of the whole project. This is followed by the problem statement, research question, objectives, significance and scope of the study. The last sub-topic elaborates the way this thesis is organized.

### 1.0 Introduction

Technology has brought a lot of changes in our life. The emergence of the internet has made a lot of changes in our daily routines as a worker, teacher, student etc. From e-services to m-services, we are given a new way to manage our daily routines by a clicking of a mouse. Online recharging services is a sustainable web application can be reached and used through PC or mobile devices which presents the easy and faster way for simplifying the recharging process of the user equipments through different LAN and wireless devices. The using of this service (Recharging services) in different business and educational sectors has been customized based on the user's requirements. The usefulness of using such a technology (Online services, mobile services, and recharging services) presented in different terms such as; easy to access anytime and anywhere, require less efforts, and easy to use. This technology (Online

The contents of  
the thesis is for  
internal user  
only

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