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Academic Session: 2009/2010

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E-SITE ORGANISER FOR PROJECT MONITORING SYSTEM

TING DING KIAT

A project report submitted in partial fulfilment of the requirements for the award of the degree of Master of Science (Construction Management)

Faculty of Civil Engineering

Universiti Teknologi Malaysia

NOVEMBER 2009

I declare that this project report entitled "*E-Site Organiser for Project Monitoring System*" is the result of my own research except as cited in the references. The project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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To the true and living God

Who is the all-inclusive, extensive and preeminent One,

Who is caring my Spirit, Soul and Body.

To my dearest father and mother

Who are there for me

Every step of the way

ACKNOWLEDGEMENTS

I thank the Lord for His sufficient grace and wisdom that enable me to complete my final year project in time. My faith in Him has helped me to overcome all the challenges and obstacles occurred during my master project writing process.

A special tribute to my supervisor, Assoc. Prof. Ir. Dr. Rosli B. Mohamad Zin and my co-supervisor, Assoc. Prof. Hj. Baderul Hisham B. Ahmad for their support and guidance to complete my master project. They had given many constructive suggestions at early stage, provided valuable feedbacks, and reviewed this report at its final stage.

In addition, I thank my parents for their advice, financial support and moral support throughout my final year project writing process. Their words of advice are a real encouragement to me.

Last but not least, I also want to thank my wife, Kong Chai Ling, my housemates and others for their help, which had contributed directly or indirectly to the completion of my master project.

ABSTRACT

The construction industry would be a wide area for the application of handheld computers due to their special features in the light weight, small in pocket size for easier in travelling and mobilisation and had own a processing features and software. In the messy construction site area, it is hard and inconvenient for site supervisor or site engineer to carry bulky plans or reference papers access to go into the construction site. The study focuses on the issue related to digitalising the project progress monitoring and proposing prototype software. Microsoft Visual Basic as the programming language tool was used to develop the prototype. Questionnaire survey and interview were conducted in this study to gather the information for prototyping. From the survey, most of the respondents (60%) had agreed that PDA is applicable to construction industry and has a good prospect in the future. Finally, E-Site Organiser, a new computer generated approach in construction jobsite monitoring system was successfully developed and be able to implement the prototype using real life construction project. From the prototype evaluation phase, most of respondents had rated the prototype system performance and the applicability of the prototype system in construction industry in excellent score. Furthermore, 47% of respondents had rated as excellent for the general rating of the prototype. Five recommendations were recommended by the respondents in order for future improvement. In conclusion, all objectives were achieved in this study. Although the prototype concept is new to the construction industry, yet the respondents agreed that this prototype concept will be adopted in the future.

ABSTRAK

Industri pembinaan akan menjadi sebuah kawasan yang luas untuk permohonan komputer-komputer pegangan tangan itu kerana ciri istimewa mereka dalam berat ringan, kecil dalam saiz kocek untuk lebih mudah dalam berjalan dan mobilisasi dan telah satu pemprosesan kendiri ciri-ciri dan perisian. Dalam tapak pembinaan yang kotor, ia adalah sukar dan tidak selesa untuk penyelia tapak atau jurutera tapak untuk membawa rancangan-rancangan sangat besar atau kertas-kertas rujukan mengakses untuk memasuki tapak pembinaan. Kajian itu menumpukan pada isu itu berkaitan untuk digitalising pengukuran kemajuan projek dan perisian prototaip perakuan. Microsoft Visual Basic sebagai alat bahasa pengaturcaraan digunakan bagi menghasilkan prototaip. Kajian soal selidik dan temubual dikendalikan dalam kajian ini untuk mengumpul maklumat untuk prototaip. Daripada tinjauan, kebanyakan responden (60%) telah bersetuju yang PDA boleh digunakan untuk industri pembinaan dan mempunyai satu harapan baik pada masa akan datang. Akhirnya, E-Site Organiser, sebuah komputer perisian baru pendekatan dijanakan di dalam pembinaan sistem pengawasan telah berjaya memajukan dan menjadi berupaya melaksanakan prototaip menggunakan projek pembinaan kehidupan sebenar. Daripada penilaian prototaip fasa, kebanyakan daripada responden-responden telah menganggap prestasi sistem prototaip dan kebolehgunaan sistem contoh dasar dalam industri pembinaan dalam mata cemerlang. Tambahan pula, 47% responden-responden telah menganggap cemerlang untuk penarafan umum prototaip. Lima cadangan telah dicadangkan oleh responden-responden dalam perintah untuk bakal pemajuan. Dalam kesimpulan, semua objektif telah dicapai dalam kajian ini. Walaupun konsep prototaip adalah baru untuk industri pembinaan, tetapi responden-responden itu bersetuju yang konsep prototaip ini akan diambil pada masa akan datang.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Introduction

For the construction industry, change is not a new phenomenon. They may be more sharks pursuing the contractor today and their ferocity may be greater, but the contractor has always being walking a beam above a shark-filled pit. What is different today is the rate of change in issues facing the construction industry and the impact that those issues have on contractors (Maloney, 1997). Construction organisation, like any other business, must look to the future to anticipate the changes to identify the opportunities created by those changes.

Managing project information during the construction phase is an important task. However, the construction industry relies heavily on written reports to document site conditions, which requires good writing skills and unbiased judgments. Each project will have their specific goals for the project to meet. The goal for the project may be that it is successful and profitable. The successful project means the project is complete within the time frame, the quality is acceptable, the client is pleased with the project, and there is no continued active liability, such as lawsuits. The profitable generally means that the project produces at least the initially expected profit.

However, the construction jobsite management is an important task in order to increase productivity. The increased productivity will resulting increased profit

and also achieved the successful of a project too. It is important to ensure an effective monitoring system is selected where it can provide a dynamic and efficiency attributes. One of the tools to be considered that can assist the site managers in improving efficiency and dynamism is to select an appropriate monitoring technique. The effective construction jobsite management will help to achieve the objectives that support the goals. The objectives would be completion of the project within the expected time frame, within the special level or satisfy quality, effective cost control, and effectiveness of the jobsite safety, client's satisfaction and effective management of subcontractors.

On most construction sites, a considerable volume of records will be amassed by the main parties and the records kept will cover a variety of aspects of the construction work. It is recognised that a very important source of information about the progress of the works is the site diaries, kept by the engineers and clerks of works on a daily basis as the work proceeds. Although these diaries as probably the most important single source of information, it has also been identified a number of deficiencies in the diaries typically kept. They are often said to be very difficult to access, sometimes illegible, occasionally inconsistent and may also lack continuity (Scott S. and Assadi S., 1997)

The construction industry is still considered a relatively traditional labour intensive industry, which the temporary project organization is characterised with many participants involve. Several electronic aid systems had been promoted in construction industry to improve the construction monitoring method. Information system with Information Technology (IT) also been introduced to provide accurate and up to date project information to the all project team members.

Some of the construction organisations have applied software systems to monitor their construction progress. However, the introduction of software systems in construction industry in Malaysia are relatively slow compared to other industry, instead of using traditional document management system. This due to the fact that design and construction are highly fragmented process where many temporary project organisations are involved. Hence, it is very hard to have a common

acceptable software system shared by each company involve in that specific cooperative project.

Digitalizing the construction phase is the recent demand of the Malaysian Construction Industry, which is the second largest industry, to implement the Tele-Construction strategies in the sector (Abd. Majid et. al., 2004).

1.2 Problem Statement

The current situation in the construction industry is that the mixture of different generation methods is used for monitoring the construction site progress.

Present trends in the construction industry have improved the need for effective and efficient evaluation, monitoring and developing the actual physical progress reports. Manual monitoring of construction sites work is costly and error prone. There is also a risk to keep the progress reports manually as the human error being.

In the messy construction site area, it is hard and inconvenient for site supervisor or site engineer to carry bulky plans or reference papers to climb up and down on the temporary access to go into the construction site. It would seem that the construction industry would be a wide area for the application of handheld computers due to their special features in the light weight, small in pocket size for easier in travelling and mobilization and had own a processing features and software as much as the desktops personal computers.

Hence, the development of integrated construction management system in software in respect of jobsite management should become the best solution to make sure the information gathered are in systematic way and easy to understand. By using software, construction site documentation can be simplified and made faster and

overburdening of the site management is prevented by increased efficiency. Therefore, there is a need of Personal Digital Assistant (PDA) to run the software to enhance the productivity of jobsite management.

1.3 Aim and Objectives of the Study

Construction industry is versatile; one of the factors due to cross intellectual of construction management, the efficient construction project management is essential for an organization survival and remains its competitiveness. Thus, the main aim of this study is successfully to develop the construction jobsite monitoring system in PDA technology.

The objectives of this study are to identify how to improve the efficiency in construction jobsite monitoring through the use of software system.

To achieve above aim, the following objectives are set:

a) To review the current practice in construction jobsite monitoring process
b) To identify the potential and requirement of electronic based monitoring system at construction site
c) To develop a new PDA based construction jobsite monitoring system
d) To evaluate the effectiveness of the jobsite monitoring system using real life project

1.4 Scope of Study

This study is limited to the construction sites within the Universiti Teknologi Malaysia. The scope of study will be focusing on the current practice of construction jobsite monitoring process.

This study will focus on the development of the new computer generated approach in Construction Site Monitoring System. The evaluation of the system is based on the real life project which located in the UTM construction site areas.

1.5 Research Outline

The study has been outlined to six chapters. The explanation of each chapter is as following:

I. **Chapter 1: Introduction**

This chapter is outlined to give the basis to develop the research. The main contents of this chapter are research background, problem statement, aim and objectives of study, and scope of the study.

II. **Chapter 2: Literature review**

Chapter 2 outlined the background of the research related to literature on the construction management in Malaysian construction industry and the current construction project monitoring system in Malaysia.

III. **Chapter 3: Methodology**

This chapter is briefly discussing the methodology for this study. The main objective is to develop a construction jobsite monitoring model using programming language (Microsoft Visual Studio 2008) to complete this study. Besides, questionnaire survey also has been distributed to the site manager. The main purpose of conducting the questionnaire survey was to highlight the current practice and support the existing practice for monitoring the project progress, which were identified through the unstructured

interviews with the professional, industry requirements that related to construction project monitoring method.

IV. **Chapter 4: Data Analysis**

Chapter four will show the collection of the data from the questionnaire in form of table, figures also analysis of these data. The analysis also will be done on the developed program due to its evaluation and suitability.

V. **Chapter 5: E-Site Organiser Application**

This chapter will discuss the development of construction site monitoring system using Microsoft Visual Studio 2008. The structure and the environment of the developed program will be described at here. The application method of the program also will be discussed within this chapter too.

VI. **Chapter 6: Evaluation of The Prototype System**

Chapter six will discuss the evaluation of the E-Site Organiser prototype system and also includes the aim and objectives of the evaluation, methodology, results and discussions on the overall evaluation process.

VII. **Chapter 7: Conclusion and Recommendation**

The last chapter will focus on the conclusion and the recommendation for the further study.