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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 sendiri 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 kebolegunaan 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

CHAPTER	TITLE	PAGE
	TITLE PAGE	i
	DECLARATION	ii
	DEDICATION	iii
	ACKNOWLEDGEMENTS	iv
	ABSTRACT	v
	ABSTRAK	vi
	TABLE OF CONTENTS	vii
	LIST OF TABLES	xii
	LIST OF FIGURES	xiii
	LIST OF APPENDICES	xv
1	INTRODUCTION	1
	1.1 Introduction	1
	1.2 Problem Statement	3
	1.3 Aim and Objectives of the Study	4
	1.4 Scope of Study	4
	1.5 Research Outline	5
2	LITERATURE REVIEW	7
	2.1 Introduction	7
	2.2 Malaysian Construction Industry	8
	2.3 Construction Site Management	10

2.4	The People Involved in the Construction Project	11
2.5	Conventional Paper Based Site Documentation	13
2.6	Computerised Project Administration	14
2.6.1	Computer Applications for Building Projects	15
2.6.2	Electronic Record Keeping	16
2.7	Site Record Keeping	17
2.7.1	Site Diary	19
2.7.2	Problems with Construction Site Diary Records	21
2.7.3	Minutes of Progress Meetings	22
2.7.4	Monthly Project Progress Report	23
2.8	Construction Photography	25
2.9	Applying Handheld Computer in the Construction Industry	28
2.9.1	The Application of PDA as Mobile Computing System on Construction Management	29
2.9.1.1	Mobile Computing and End User Computing	30
2.9.2	Automating Progress Measurement of Construction Projects	31
2.10	PDA's History and Feature	32
2.10.1	History of Pocket PC	33
2.10.2	Features of Pocket PC	35
2.11	Operating System Platform for Handheld Computer	36
2.11.1	Palm OS (Operating System)	36
2.11.2	Window Mobile OS (Operating System)	37
2.11.3	Symbian OS Platform	41
2.12	Modelling	42
2.12.1	In Existence Model	43
2.12.2	Lotus Organiser	44
2.12.2.1	Lotus Organiser Features	44

2.12.3	Site Journal	46
2.12.4	JKR SKALA System	49
2.13	Microsoft Visual Basic	50
2.13.1	Introduction to Microsoft Visual Basic	50
2.13.2	Microsoft Visual Studio 2008	51
2.13.3	Environment in Microsoft Visual Basic 2008	52
2.13.4	Smart Device Application	53
3	METHODOLOGY	54
3.1	Introduction	54
3.2	Research Process	55
3.3	Research Methodology	56
3.3.1	Literature Review	56
3.3.2	Data Collection	57
3.3.2.1	Questionnaire Survey	57
3.3.2.2	Interview	58
3.3.3	Conceptual of Model Development	59
3.3.4	Prototype Development	60
3.3.5	Prototype Testing and Evaluation	62
3.3.6	Conclusion and Recommendation	62
4	DATA ANALYSIS	63
4.1	Introduction	63
4.2	Respondent Background	63
4.3	Current Practice Used to Record the Construction Work Progress	66
4.4	Recommendations of the Respondent for the Proposed Method	69

5	E-SITE ORGANISER APPLICATION	72
5.1	Introduction	72
5.2	Program Application of E-Site Organiser Viewer	76
5.2.1	Welcome Screen	76
5.2.2	Term and Condition	77
5.2.3	Main Menu	77
5.2.4	To View the Detail of Reports' Item	78
5.2.5	Read Me Form	79
5.2.6	The Instruction Form	80
5.3	Program Application of E-Site Organiser	80
5.3.1	Welcome Screen	81
5.3.2	Login Screen	81
5.3.3	Main Menu Screen	82
5.3.4	Project Progress Screen	83
5.4	Microsoft Office Excel as Progress Report Spreadsheet	83
6	EVALUATION OF THE PROTOTYPE SYSTEM	87
6.1	Introduction	87
6.2	Evaluation Questionnaire Design	88
6.3	Analysis of Evaluation Results	89
6.4	Prototype Limitation	94
6.5	Summary	94
7	CONCLUSION AND RECOMMENDATION	96
7.1	Introduction	96
7.2	Realization of Study Objective	96
7.2.1	Review the Current Practice in Construction Jobsite Monitoring Process	96

7.2.2	Identifying the Potential of Prototype System at Construction Site	97
7.2.3	Development of New PDA Based Construction Monitoring System	97
7.2.4	Evaluation of Prototype in Real Life Construction Project	98
7.3	Recommendation of Further Improvement	98
	REFERENCES	99
	APPENDICES	103-110

LIST OF TABLES

TABLE NO.	TITLE	PAGE
2.1	Valuation on the use of PDA in Construction industry	29
4.1	Gathered data for year experience of the respondents	64
4.2	Highest academic qualification of respondents	65
4.3	Knowledge about the electronic site diary system of respondents	66
4.4	Frequency of site diary submittal of respondents	67
4.5	The benefits of electronic record keeping system	69
4.6	The comments of the respondents in term of site work improving and work efficiency	70
4.7	The agreement of respondents to use the electronic site diary in future	70
6.1	Results of evaluation	90
6.2	The benefits of the prototype system	93
6.3	The way of improvement for the prototype system	93
6.4	Others comment	93

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
2.1	Data transfer between PDA and PC	31
2.2	(a) Interface of Pocket PC 2000, (b) Interface of Pocket PC 2002 (c) Interface of Pocket PC 2003, (d) Interface of Window Mobile 5.0 and (e) Interface of Window Mobile 6.1	40
2.3	Symbian OS Platform that used in most of the mobile devices	42
2.4	Lotus Organizer diary page	45
2.5	Lotus Organizer notepad section	46
2.6	Interface for Site Journal in Window Platform	47
2.7	User can enter everyone present by selecting from the company list and record the performance status in note form. The text is completed later in the office	48
2.8	Fast recording of defects, delays, obstructions, instructions, acceptances, additional comments, building material deliveries, etc. Documentation of scheduled deliveries	48
2.9	Front page of the SKALA system webpage	50
2.10	Environment in Microsoft Visual Basic 2008	52
2.11	Environment of Smart Device Applications in Microsoft Visual Basic 2008	53
3.1	The flow chart of methodology	55
3.2	Sketches and software prototype	60

3.3	Steps in Programming Development	61
4.1	Percentage breakdown of respondent base on years of practice	64
4.2	Percentage breakdown of respondent's highest academic qualification	65
4.3	Percentage breakdown of knowledge about the electronic site diary system of respondents	67
4.4	Percentage breakdown of the frequency of site diary submittal of respondents to their up line manager	68
4.5	Percentage breakdown of the agreement of respondents to use the electronic site diary in future	71
5.1	Flow chart of processes for E-Site Organiser Viewer	74
5.2	Flow chart of processes for E-Site Organiser	75
5.3	Welcome Screen form interface	76
5.4	Term and Condition form interface	77
5.5	Main Menu	78
5.6	Interface of reports viewer menu	79
5.7	Interface of Read Me Form	79
5.8	Interface of Instruction form	80
5.9	Welcome Screen on PDA interface	81
5.10	Login Screen	82
5.11	Main Menu Screen	82
5.12	(a) Project Progress screen interface, (b) Summary View form, (c) Edit View form	83
5.13	The example of project task progress in PDF form	85
5.14	The spreadsheet interface in PDA	86
6.1	Chart of the System Performance Rating	91
6.2	Chart of the applicability to the construction industry	92
6.3	Chart of the general rating of the prototype	92

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
A	QUESTIONNAIRE SURVEY	103
B	EVALUATION QUESTIONNAIRE	109

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 been 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 result in 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.