

**CLIENT PERSPECTIVE TOWARDS APPLICATION OF INDUSTRIALISED
BUILDING SYSTEM IN PRIVATE CONSTRUCTION PROJECTS**

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BUILDING SYSTEM IN PRIVATE CONSTRUCTION PROJECTS

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Specially dedicated to all precious people around me, especially:

*The greatest parents in the world, Abah, Suraji bin Adnan, and Mak, Zuntihana binti
Haji Dawam, and both my parents-in-law. And most of all I devote this to my
beloved husband, Mohd. Fairuz bin Abu Kaslan, my future kids, and to
all my family members and friends.*

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Thank you very much.

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ABSTRACT

Industrialised Building System (IBS) is well known in many developed countries due to the benefits that can be derived from its applications in construction projects. However, the low percentage of IBS usage may be due to lack of awareness and knowledge about IBS among many professionals, also there may be factors that contribute to lack of interest from the client towards IBS. The aim of this study is to improve the application of IBS, particularly in private construction projects in Malaysia by determining the current application of IBS in private construction projects, client perspective towards IBS application, and to propose the framework of success criteria for IBS adoption in private projects. In order to achieve these objectives, questionnaire survey and interview have been conducted. The developers were selected from Real Estate and Housing Developers Association (REHDA) website as the sample of respondents. The result indicates that, out of 35 responses, only 16 respondents (46 percent) stated their company has applied IBS in their construction projects, and only 12 respondents (34 percent) have been involved in IBS projects. Out of those 12 respondents, 9 respondents (75 percent) revealed they were satisfied with the performance of IBS projects based on their own experience. In general, respondents indicated high agreement on the identified IBS benefits, the factors of low application of IBS in private construction projects, and the success criteria to improve the IBS application. In the final part of the study, a framework of success criteria relationship for IBS adoption in private projects has been developed.

ABSTRAK

Sistem Pembinaan Berindustri (IBS) terkenal di banyak negara-negara membangun kerana manfaat yang boleh diperolehi daripada pengaplikasiannya di dalam projek-projek pembinaan. Walau bagaimanapun, peratusan penggunaan IBS yang rendah mungkin disebabkan oleh kurangnya kesedaran dan pengetahuan mengenai IBS di kalangan ramai profesional, juga mungkin ada faktor-faktor yang menyebabkan klien kurang berminat terhadap IBS. Matlamat kajian ini adalah untuk meningkatkan penggunaan IBS terutamanya dalam projek-projek pembinaan swasta di Malaysia dengan menentukan pengaplikasian semasa IBS dalam projek-projek pembinaan swasta, menentukan perspektif klien terhadap pengaplikasian IBS, dan untuk mencadangkan rangka kerja kriteria kejayaan penggunaan IBS dalam projek-projek swasta. Dalam usaha untuk mencapai objektif-objektif ini, kaji selidik dan temu bual telah dijalankan. Pemaju telah dipilih daripada laman web *Real Estate and Housing Developers Association* (REHDA) sebagai sampel responden. Hasil kajian menunjukkan bahawa, daripada 35 maklum balas, hanya 16 responden (46 peratus) menyatakan syarikat mereka telah menggunakan IBS dalam projek pembinaan mereka, dan hanya 12 responden (34 peratus) pernah terlibat dalam projek-projek IBS. Daripada 12 responden tersebut, 9 responden (75 peratus) menyatakan bahawa mereka berpuas hati dengan prestasi projek-projek IBS berdasarkan pengalaman mereka sendiri. Secara amnya, responden menyatakan persetujuan yang tinggi terhadap manfaat IBS yang telah dikenalpasti, faktor-faktor pengaplikasian IBS yang rendah di dalam projek pembinaan swasta, dan kriteria kejayaan untuk meningkatkan pengaplikasian IBS. Dalam bahagian akhir kajian ini, sebuah rangka kerja hubungan kriteria kejayaan bagi penggunaan IBS dalam projek-projek swasta telah dibangunkan.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	DECLARATION	ii
	DEDICATION	iii
	ACKNOWLEDGEMENT	iv
	ABSTRACT	v
	ABSTRAK	vi
	TABLE OF CONTENTS	vii
	LIST OF TABLES	xiii
	LIST OF FIGURES	xiv
	LIST OF ABBREVIATIONS	xvi
	LIST OF APPENDIX	xvii
1	INTRODUCTION 1.1 Background 1.2 Problem Statement 1.3 Aims and Objectives of the Study 1.4 Scope of the Study and Limitations 1.5 Significance of the Study	1 1 3 5 5 6
2	LITERATURE REVIEW 2.1 Introduction 2.2 Definitions of IBS	7 7 7

2.3	Perspectives of IBS Malaysia	9
2.4	IBS Application in Public and Private Construction Projects	11
2.5	The Government Perspectives on the Alignment of Industry and Government Objectives	13
2.6	Perspectives on the Benefits of IBS	14
2.6.1	Reduce Remittances by Foreign Workers	15
2.6.2	Enhance Efficiency of Construction Process	15
2.6.3	Produce Better Product	16
2.6.4	Reduce Wastage, Less Site Materials, Costs, Cleaner and Neater Environment	16
2.6.5	Higher Quality of Component	16
2.6.6	Reduce Labour Requirement at Site	17
2.6.7	Faster Completion of the Project	18
2.6.8	Not Affected by Adverse Weather Condition	18
2.6.9	Flexible Design	18
2.7	Perspectives on IBS versus Conventional System	19
2.7.1	IBS versus Conventional System: Labour Requirements	20
2.7.2	IBS versus Conventional System: Project Cost Performance	21
2.7.3	IBS versus Conventional System: The Flexibility of the System	24
2.8	Perspectives on Selection Criteria for Choosing IBS	25
2.9	Perspectives on the Barriers to the Implementation of IBS	27
2.9.1	Cost and Return Investment	27
2.9.2	Lack of Skilled and Knowledgeable Manpower	28
2.9.3	The Practices	29
2.9.4	Knowledge Based in Design and Installation	29
2.9.5	Low Quality of End Product	31
2.9.6	Lack of Incentive and Awareness	31

2.9.7	Lack of Scientific Information	32
2.9.8	Wastage of Materials	32
2.9.9	Applicability in Design	33
2.9.10	Resistance to Change	33
2.9.11	Bad Reputation of Unsuccessful IBS Project	35
2.9.12	Failure in Technology Transfer	35
2.9.13	Insufficient IBS Manufacturer in Industry	36
2.9.14	Availability of Cheap Foreign Labour	36
2.9.15	Low Standardization of Components	37
2.10	Perspectives on the Critical Success Factors (CSFs) of IBS	38
2.10.1	Good Working Collaboration	38
2.10.2	Effective Communication Channel	38
2.10.3	Continues Improvement and Learning	39
2.10.4	Coordination of Design, Manufacture, Transportation, and Installation	39
2.10.5	Key Decisions on Strategy, Application, Design, Logistic and Detail Unit	39
2.10.6	Involvement of Team Members during Design Stages	40
2.10.7	Experience Workforce and Technical Capable in Design, Planning, Organising and Controlling Function	40
2.10.8	Information and Communication Technology (ICT)	41
2.10.9	Close Relationship with Suppliers and Sub-Contractors	41
2.10.10	Extensive Planning and Scheduling	41
2.10.11	Improvement in Procurement Strategy and Contracting	42
2.10.12	Risk Management Strategy	42
2.10.13	Process Standardisation and Concept of Repetition	42
2.10.14	Management of Supply Chain and Logistic Activities	43

	2.10.15 'Top-Down' Commitment and Corporate Motivation	43
	2.10.16 Skilled Labour	43
	2.10.17 Strategies and Business Approaches	44
	2.11 Framework of IBS Decision Making	44
	2.11.1 Psychology Factors of IBS Decision Making	44
	2.11.2 Behavioural Factors of IBS Decision Making	46
	2.12 Perspectives on the Strategies for Improving IBS Application	47
3	RESEARCH METHODOLOGY	52
	3.1 Introduction	52
	3.2 Research Methodology	52
	3.3 Stage 1: Identification of Objectives and Scope of Study	54
	3.4 Stage 2: Data Collection	54
	3.4.1 Primary Data Collection (Literature Review)	55
	3.4.2 Distribution of Questionnaires	55
	3.4.2.1 Sampling of Data	56
	3.4.2.2 Questionnaire Design	57
	3.4.3 Interview	60
	3.5 Stage 3: Data Processing (Method of Analysis)	60
	3.5.1 Average Index	60
	3.5.2 Frequency Analysis	61
	3.5.3 Mean	61
	3.5.4 Rank	62
	3.5.5 Standard Deviation	62
	3.5.6 Indication	63
	3.5.7 Framework Proposal	63
	3.6 Stage 4: Conclusion and Recommendation	64

4	RESULTS AND DISCUSSION	65
	4.1 Introduction	65
	4.2 Distribution and Return of the Questionnaire	65
	4.3 Structure of Questionnaire	67
	4.4 Section A Part I: Respondents' Information	67
	4.4.1 Age of Respondents	67
	4.4.2 Level and Specialisation of Position of the Respondents	68
	4.4.3 Respondents' Highest Education	70
	4.4.4 Respondent Experience in Construction Industry	71
	4.4.5 Respondents' Experience involve in IBS Projects	72
	4.5 Section A Part II: Company Information	72
	4.5.1 Application of IBS in the Construction Projects	73
	4.5.2 Number of Projects using IBS	74
	4.5.3 Average Cost of IBS Projects	75
	4.6 Section B Part I: Consensus on IBS Application through Experience	76
	4.6.1 Effects of IBS to Project Performance	76
	4.6.2 Client Satisfaction	78
	4.7 Section B Part II: Benefits of IBS	79
	4.8 Section B Part III: Factors of Low Application of IBS in Private Construction Projects	81
	4.9 Section C Part I: Expectations on IBS Application in Future Projects	84
	4.9.1 General Expectations on IBS Application in Future Projects	85
	4.9.2 The Tendency to Prefer IBS in Future Projects	87
	4.9.3 Compulsory IBS Application in Private Projects	89
	4.10 Section C Part II: Success Criteria in improving IBS Application in Private Construction Projects	90
	4.10.1 Corporate Plan to be implemented by Client	91

4.10.2	Design Plan to be implemented by Consultants	92
4.10.3	Implementation Plan to be implemented by Contractor	94
4.10.3.1	Financial Plan	94
4.10.3.2	Operational Plan	95
4.10.3.3	Performance Control	96
4.10.4	Promotion Strategies to be implemented by CIDB	96
4.10.5	Business Strategies to be implemented by Manufacturers	98
4.11	Framework of Success Criteria Relationship	99
5	CONCLUSIONS AND RECOMMENDATIONS	104
5.1	Conclusions	104
5.1.1	Objective 1: To Determine the Current Application of IBS in Private Construction Projects	104
5.1.2	Objective 2: To determine the Client Perspective towards Application of IBS in Private Construction Projects	105
5.1.3	Objective 3: To Propose the Framework of Success Criteria in improving the Application of IBS in Private Construction Projects	105
5.2	Recommendations	106
	REFERENCES	108
	APPENDIX	116

LIST OF TABLES

TABLE NO.	TITLE	PAGE
2.1	The Number of IBS Manufacturer for Each State	49
3.1	Information Gathered through the Questionnaire	58
4.1	Client Opinion on the Benefits of IBS	80
4.2	Factors of Low Application of IBS in Private Construction Projects from Client Perspective	81
4.3	Client Opinion on the Factors of Low Application of IBS in Private Construction Projects (by Category)	82
4.4	General Expectation on IBS Application in Future Projects	85
4.5	Success Criteria for IBS Adoption in Private Construction Projects	90
4.6	Corporate Plan of Success Criteria of IBS Application	92
4.7	Design Plan of Success Criteria of IBS Application	93
4.8	Financial Plan of Success Criteria of IBS Application	94
4.9	Operational Plan of Success Criteria of IBS Application	95
4.10	Performance Control of Success Criteria of IBS Application	96
4.11	Promotion Strategies of Success Criteria of IBS Application	97
4.12	Business Plan of Success Criteria of IBS Application	98

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
2.1	Key Milestones IBS	10
2.2	Level of IBS Technology Performance against Time	11
2.3	Conceptual Framework of Psychological Decision Making of IBS Technology	45
2.4	Conceptual Framework of IBS Decision Making Based on Behavioural Factors	46
3.1	Research Methodology Flow Chart	53
3.2	Framework Development Flow Chart	64
4.1	Return Percentage of Questionnaire by the Respondents	66
4.2	Age Range of Respondents	68
4.3	Level of Position of Respondents in Company	69
4.4	Specialisation of Position of Respondents in Company	69
4.5	Respondents' Highest Education	70
4.6	Respondents' Experience in Construction Industry	71
4.7	Respondents' Experience Involved in IBS Project	72
4.8	Application of IBS in the Projects by the Company	73
4.9	Range Total Number of Projects Using IBS	74
4.10	Average Cost of the IBS Projects Implemented by Developers	75
4.11	Results of IBS in terms of Cost, Time and Quality	77
4.12	Clients Satisfaction towards IBS Project Performance	79

4.13	Tendency of Clients to Implement IBS in Future Projects	88
4.14	Consent of Respondents on the Compulsory IBS Application in Private Construction Projects	89
4.15	Success Criteria Relationship for IBS adoption in Private Projects	100

LIST OF ABBREVIATIONS

BAM	-	Board of Architects Malaysia
BEM	-	Board of Engineers Malaysia
BEST	-	Behavioural-Environment Strategy -Technology
CIDB	-	Construction Industry Development Board
CIMP	-	Construction Industry Master Plan
CREAM	-	Construction Research Institute of Malaysia
CSFs	-	Critical Success Factors
IBS	-	Industrialised Building System
ICT	-	Information and Communication Technology
ICU	-	Implementation Coordination Unit
IT	-	Information Technology
JKR	-	Jabatan Kerja Raya
KPI	-	Key Performance Indicators
MC	-	Modular Coordination
MMC	-	Modern Method of Construction
OSM	-	Off-Site Manufacturing
PDM	-	Psychology Decision Making
R&D	-	Research and Development
REHDA	-	Real Estate and Housing Developers Association
SPSS	-	Statistical Package for Social Science

LIST OF APPENDIX

APPENDIX	TITLE	PAGE
A	Questionnaire	116

CHAPTER 1

INTRODUCTION

1.1 Background

Industrialised Building System (IBS) has been well-known in many developed countries as it produces high-quality construction, lower total construction cost, shorten the construction period, reduces dependence on foreign labour, reduces on-site construction works, reduces waste building materials, maintains the cleanliness and improves safety on construction sites, easier to control, reduces rectification work, as well as leads to the construction of a sustainable environment. As a developing country, practicing IBS in Malaysian construction industry should be an opportunity and one of our initiatives to put the construction industry at a better level. It is because by applying IBS, it can minimise the problems in the construction industry that always arise when using a conventional method as well as improve the overall performance of the project.

Malaysia had long been aware of this opportunity and has started to apply IBS since the year of 1964. Nawi and Nifa (2007) revealed that the application of IBS in Malaysia began with two government pilot projects. The first construction project using IBS involved the construction of seven blocks of 17 storey flats, and four blocks of 4-storey shop lots that executed at Jalan Pekeliling, Kuala Lumpur (Thanoon, *et al.*, 2003). The second pilot project was executed in Pulau Pinang, which encompassed the construction of six blocks of 17 storey flats and 33 blocks of

18 storey flats along Jalan Rifle Range. The project used French Estiot System (Din, 1984).

In fact, Malaysia nowadays is successfully applied IBS in the construction of national landmark buildings such as the Bukit Jalil Sports Complex, Kuala Lumpur Light Rail Transit Station, Kuala Lumpur Central, Kuala Lumpur International Airport (KLIA), the PETRONAS Twin Towers and Kuala Lumpur Tower. Construction Industry Development Board (CIDB) has also played very important roles in the efforts to promote the use of IBS in construction projects in Malaysia to carry out various several on IBS, develop standards and conduct various training, workshops and promotional programs.

Although the history of the application and use of IBS in Malaysia has started over 40 years ago, until now, there are still numerous issues that have yet to be overcome. In fact, IBS still not been well accepted by all stakeholders in the Malaysian construction industry when its application seems still low. Based on the CIDB IBS Survey in 2003, only 15% of construction projects in Malaysia apply IBS. In addition, the IBS Mid Term Review in 2007 indicated that approximately only 10% of the completed projects used IBS in the year 2006 as compared the forecasting of IBS usage by 50% in 2006 and 70% in the year 2008 as projected in the IBS roadmap conducted by CIDB (Hamid *et al.*, 2008).

Based on many previous studies that have been conducted, it is believed the percentage of low usage of IBS is due to lack of awareness and knowledge about IBS among many professionals in the construction industry in Malaysia, as well as resistance, barriers and other negative issues that have limited the development of the use of IBS in Malaysia. According to Hassim *et al.* (2009), IBS in Malaysia is not well accepted by the construction stakeholders due to failure to address the risks in the IBS projects adequately. It probably contributes to the doubt of professionals to implement IBS in construction projects in Malaysia, especially when there is no policy or even insistence to implement it.

Recognising this, the government has taken another step to try to encourage the growth of IBS application by urging the use of IBS in all government construction projects. Through the policy issued in 2008, the government invited and insists the new project to apply IBS by using an open system and demand the content of IBS components until 70% (IBS score) in all government projects. Further, according to Kamar *et al.* (2010), from 2006 to 2010, in approximate of 320 government's projects worth RM9.43 billion has recognised were carried out by applying IBS. It shows that IBS usage has evolved, but still at an unsatisfactory level.

Further, with the government enforcement on the application of IBS, it is hoped that construction stakeholders begin to plan strategies to ensure they contribute to increase the use of the IBS in construction projects as well as the successful implementation, thus able to experience the benefits of IBS in advancing the technology, productivity and performance of Malaysian construction industry.

1.2 Problem Statement

The role of government in developing the policy to achieve the satisfactory level of IBS implementation has contributed significant impact on the IBS issues (Abdullah and Egbu, 2010a). In general, since government enforced the policy that encourages all the stakeholders of Malaysian construction industry to improve the implementation until 70% of IBS components in all government projects, it seems yielded the positive result.

The critical success factors (CSFs) for the application of IBS,, especially in government construction projects are studied, and its implementation is being improved from time to time. The related problems in construction projects which adopt IBS also evaluated and attempted to be resolved to enhance the value of IBS projects. This is to ensure that the projects achieve the targeted objectives, especially increase the productivity and improving the performance of the project itself. However, the implementation of IBS in private projects seems still far behind. In

general, the current studies indicate that the applications of IBS in private construction projects are still at a low level.

Based on the pre-interview conducted with Ir. Dr. Kamarul Anuar Mohamad Kamar, Manager at Construction Research Institute of Malaysia (CREAM), which a research arm of CIDB, he stated that *“Based on observation and workshops conducted by CIDB, the implementation of IBS in private construction projects is still quite low. However, there are no specific data to confirm this information; it is still in the observation and evaluation in our study.”*

Kamar *et al.* (2009) revealed that one of the barriers to IBS implementation in Malaysia is awareness and knowledge among professionals about IBS. According to IBS Roadmap Review (2007) report, the adoption of IBS in Malaysia is a client driven. However, lack of the awareness program to understand the client needs and giving correct information on IBS has been contributing to a lack of interest from the client and decision makers (Rahman and Omar, 2006).

Therefore, knowledge of IBS should actually overrun by all the stakeholders involved in a construction project. Not only contractors who will certainly run the project, but widespread and deep knowledge by other stakeholders and professionals, including the client, the architects and engineers are also very important to ensure the implementation of IBS in a construction project is successful in achieving its objectives. In fact, the client can play vital roles when they really understand the concept, method, technique as well as the critical success factors of this system. They can influence the percentage of IBS usage in construction projects in Malaysia. However, many of the professionals, particularly client, they still lack of knowledge about the concept and method of IBS, and how they can contribute to the success of the project. Consequently, the clients are reluctant to adopt IBS, particularly in private construction projects.

1.3 Aims and Objectives of the Study

The aim of this research is to improve the application of Industrialised Building System (IBS) particularly in private construction projects in Malaysia. In order to achieve the aim of the study, the objectives of this study are as follows:

- a) To determine the current application of IBS in private construction projects.
- b) To determine the client perspective towards the application of IBS in private construction projects.
- c) To propose the framework for success criteria in improving the application of IBS in private construction projects.

1.4 Scope of the Study and Limitations

In order to achieve the objectives of the study, the research only focusing on the perspective towards application of IBS in private construction projects in Malaysia. This is because it is believed that government construction projects have advanced a step further when they have a fairly strong support from the enforcement of government policy on the application of IBS in each government construction project. Therefore, this study intended to focus on private construction projects only.

In addition, data collection for this study is from the respondents to the questionnaire which they are among the housing developers only. This is intended to get a holistic view of the client where they are the key drivers for the development of a construction project in Malaysia.

The analysis and conclusion are based on respondent's overview from the questionnaire that designed for this study only. The analysis results probably do not represent the whole overview of Malaysian construction industry. Nevertheless, it is

expected can help provide insight and views as well as knowledge about the current application of IBS in private construction projects, thus helping to formulate appropriate strategies for the successful implementation of IBS, especially in private construction projects.

1.5 Significance of the Study

This study is important to find out the percentage and study the current application of IBS in private construction projects in Malaysia. According to Azman *et al.* (2010), this is a challenge which construction players need a 'step change' in construction method and process to overcome the poor-quality construction and low productivity, at the same time need to meet the growth in demand. This is to enable us to enhance strategies on how to better promote the implementation of IBS in private construction projects other than the government enforcement, research, and standards development has so far been implemented.

In addition, this study is to determine the client's perspective on the use and implementation of IBS in private construction projects to determine the extent of their awareness and knowledge of the IBS. Their thoughts and knowledge contribution is very important for the more encouraging, supporting and driving the implementation of IBS in Malaysian construction projects and not just rely on the roles and obligation undertaken by other professionals only. This is important for planning strategies so that clients can also play important roles in promoting the use of IBS in private construction projects apart of contribute in ensuring the successful implementation of IBS.

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