

## **IBS PLASTIC FORMWORK: ANALYSIS ON AWARENESS AND READINESS FACTOR IN MALAYSIAN CONSTRUCTION INDUSTRY**

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The purpose of this paper is to consider the application of IBS plastic formwork with regard to the awareness and readiness of the stakeholders especially among contractor. Based on the contribution factor from extensive literature review of published work within the industry in relation to the IBS formwork, forming a basis for further findings through the qualitative and quantitative approach has developed a conceptual framework in a way to propose the best possible factor in increasing the application of IBS plastic formwork in Malaysia Construction Industry.

**Keywords:** IBS application; awareness; readiness; IBS plastic formwork.

### **INTRODUCTION**

Formwork plays important roles in producing concrete structure which allows contractors to cast the main parts of a building which are required as a strong support to the structure and building (Hanafi *et al.*, 2015) and also as a temporary structure provided a containment to the fresh concrete (Ghazali, 2014). One of the effort in promoting IBS, Construction Industry Development Board (CIDB) suggested IBS plastic formwork as an alternative to replace the conventional system when realized that this components is important and give a full of benefit in construction in terms of sustainability (Ghazali, 2014; Nawati, *et al.*, 2014). The IBS plastic formwork was designed from a lightweight material that can support loads of the equipment, workers, impact of various kinds, or sometimes wind without collapse or excessive deflection. Other than that IBS plastic formwork also offered a speed of construction and lower on life-cycle costs. As indestructible formwork with strong panels that are interlocking and modular in nature, make it easily to construct the formwork for concrete. These forms have become increasingly popular for casting unique shapes and patterns being designed in concrete because of the excellent finish obtained requiring minimum or no surface treatment and repairs. IBS plastic formwork offered with various types of plastic forms like glass reinforced plastic, fibre reinforced plastic and thermoplastics (Haron *et al.*, 2005).

### **LITERATURE MAPPING**

The awareness and readiness by the contractor seem obviously becoming a justification for this research regarding to the famous issue's discussed by

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professional researcher. Based on several elements studied in literature review, it is clearly discussed a several contribution factor on the application of IBS plastic formwork in construction and eight (8) factor were identified as an initial contribution for the less application of IBS plastic formwork known as high initial investment capital, familiarity on conventional method, uncompetitive industry, lose in tendered bidding, readiness of globalization era, awareness on training and short courses, awareness on product marketability and readiness on financially capability. Further discussed from the literature mapping, a summary of contribution factor shown between eight (8) factors, there are most three (3) critical issue in application of IBS plastic formwork ; due to the awareness on training and short courses, awareness on product marketability and readiness on financially capability.

### **METHODOLOGY**

There are five (5) stages applied in this research to its completion which involves the process of literature mapping, interview, development of conceptual framework and hypothesis, survey questionnaire, testing and analysis, and conclusion of the research. Interview to the selected contractors as a respondent who are involved in Malaysian's construction field to achieve the objective on identify the awareness and readiness factor for IBS plastic formwork application among Malaysian contractor. The development of conceptual frameworks and hypothesis gathered from the distribution of survey questionnaires form to ensure that all the variables gained from first phase data collection is positive within issues and problem discussed. The quantitative data collection method are designed to fulfil and achieve the second objective of this research which is to propose the best possible factor for IBS plastic formwork's application in Malaysian Construction Industry.

The three main factors are justify as the highest rating elements from summary of the issue in implementing IBS plastic formwork based on intensive literature and primary data had been studied previously. These three elements of justification for this study will be the main factor for the sub factor which found in practice when interview session was conducted in first phase of data collection. In designing the questions in questionnaires survey forms, the additional sub variables that was found in practice will be sub factors for this survey questions and each will be stated under their owns main factor. The evaluation by respondents on the sub factor based on each question will be design for agreement using a Likert Scale Technique.

### **RESULTS AND DISCUSSION**

#### **Conceptual Framework**

Based on the data gained from literature review and structured interviews session, three main groups of factors were generated to explore the relation between the particular variables and the important factors for the IBS plastic formwork application in Malaysian Construction Industry and found to be reliable as show in Table 1;

TABLE 1: DEVELOPMENT OF IBS CONCEPTUAL FRAMEWORK BASED ON LITERATURE

<i>Factor</i>	<i>Sub Factor</i>	<i>Perception</i>
F1	Awareness on training and short courses factor	
	(a)	Techniques of installation
	(b)	Training and short courses notification
F2	Awareness on product marketability factor	
	(a)	Product availability in market
	(b)	Product's information
F3	Readiness in financially capable factor	
	(a)	Market price of IBS plastic framework
	(b)	Financially incapability
	(c)	Burden of companies financier

Frameworks reveal that the contractor's awareness on training and short courses factor including marketability of the product's factor and readiness in financial are the key issues that contributed to the important factor for IBS plastic formwork's application.

### Best Possible Factor

TABLE 2: SURVEY RESULT

<i>Factor</i>	<i>Sub Factor</i>	<i>Perception</i>	<i>Mean Value</i>
F1	Awareness on training and short courses factor		
	(a)	Techniques of installation	2.88
	(b)	Training and short courses notification	3.32
F2	Awareness on product marketability factor		
	(a)	Product availability in market	1.56
	(b)	Product's information	4.08
F3	Readiness in financially capable factor		
	(a)	Market price of IBS plastic framework	2.24
	(b)	Financially incapability	4.04
	(c)	Burden of companies financier	3.80

<i>Rating</i>	<i>Rating Scale</i>	<i>Classification</i>
1.	very low or extremely ineffective	$1.00 \leq \text{Average index Score} \leq 1.50$
2.	low or ineffective	$1.50 \leq \text{Average index Score} \leq 2.50$
3.	medium or moderately ineffective	$2.50 \leq \text{Average Index Score} \leq 3.50$
4.	high or very effective	$3.50 \leq \text{Average Index Score} \leq 4.50$
5.	very high or extremely effective	$4.50 \leq \text{Average Index Score} \leq 5.00$

Figure 1: Rating Scales and Classification (Mc Caffer, 1997)

Table 2 present the survey result for overall elements in determine the best possible factor based on the average mean score index for important factor in IBS plastic formwork's application. The best possible factor is determined with the average mean score index is 3.50 and above [2]. By referring to the table, there are several elements of important factor reach a level more than 3.50. Therefore, the elements of Information Delivering (F1c), product's Information (F2b), Supplier's Dealing (F2c), Financially Incapable (F3b) and Burden of Companies Financier (F3c) give the average mean index more than 3.50 and determined as the best possible factors for IBS plastic formwork's application in Malaysian Construction Industry.

## CONCLUSION

The aims of this research which is to proposed the best possible factor to increase the uses of IBS plastic formwork's application in Malaysian Construction Industry, the first phase of data collection method using the interview session with selected contractor as a respondents in this research as strategies to achieve first objective. Several elements that was found as an awareness and readiness factor among Malaysian contractor while it was done regarding to justification for this research.

Through the interview session that had been conducted to achieve first objective, there are nine (9) numbers of variables that was found in practices on awareness and readiness factor as an important factor on less application of IBS plastic formwork which are, (1) Techniques of Installation, (2) Training and Short Courses Notification, (3) Information Delivering, (4) Product's Availability in Market, (5) Product's Information, (6) Supplier's Dealing, (7) Market Price of IBS Plastic Formwork, (8) Financially Incapability and (9) Burden of Companies Financier.

From the outcomes of these nine (9) numbers of elements or variables that had been found in practice, the development of conceptual framework was done. All the variables had shown the positive relation between the important factors for IBS plastic formwork's application while making the hypothesis process in this research.

The process of second phase data collection method using survey questionnaires forms is conducted to make a testing on all variables which had positive relation in hypothesis process. All nine (9) numbers of variable was evaluated by the respondents in identify the most critical factor when using an identification of average mean score index. After all the survey questionnaires evaluated and feedback from respondents, the results and finding shown not all the variables are the critical factor for IBS plastic formwork's application. There are several variables reach the average mean score required which are 3.50 and above.

From nine (9) variables, only five (5) elements reach the average mean index above 3.50 which are (1) Information Delivering, (2) Product's Information, (3) Supplier's Dealing, (4) Financially Incapable and (5) Burden of Companies

Financier. These five variables are considered as the critical factor in this study. All five factors then been proposed as the best possible factor for IBS plastic formwork's application in achieving the second objective and to reach the aims of this research which to increase the application of IBS plastic formworks in Malaysian Construction Industry.

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