

INNOVATION AND RESEARCH AND DEVELOPMENT IN CONSTRUCTION  
INDUSTRY

SYAZWANI BINTI ABDUL RAMAN

UNIVERSITI TEKNOLOGI MALAYSIA

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SYAZWANI BINTI ABDUL RAMAN

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**DEDICATION**

*Especially for*

*My beloved parents*

***Dayang Hasnah Yusof and Abdul Raman Tamin,***

*“Your unrepayable love motivates me endlessly”.*

*My beloved sibling*

***Mohammad Syazwan Binti Abdul Raman***

*Who give me moral supports and inspiration in your own way*

*Friends, supervisor,*

*Your encouragement makes me forget the meaning of being a quitter.*

*You know who you are.*

*May Allah have mercy on you and gives you blessing for the rest of your life.*

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## ABSTRACT

Innovation is a success of new ideas. In constructions, innovation can be done from the research and development done by the key player. Some restrictions are faced due to innovation where the parties cannot adapt themselves due to the fast innovations happened in the industry. This purpose of this study is to examine the construction professionals' view on issues of innovation and research and development in Malaysia construction industry. The objectives of this study are to determine the current state of innovation and research and development in construction, to identify the impact of innovation and research and development in construction and also to identify the respondent wishes and ideas on issues that require innovative feedback from the construction industry. Forty eight (48) set of questionnaire had been collected among the construction professionals in Klang Valley and Selangor area. The questionnaire had been analysed using SPSS software for the reliability test result, percentage frequency distribution and Relative Importance Index (RII). Data then tabulated in table and illustrated in the form of charts. The result of the study shown that the amount of money spends for the research and development in construction is only about up to RM15, 000. Innovation and research and development give more impact in increase of productivity. The professionals wish for more sustainable energy, material and method from the innovation through research and development.

## ABSTRAK

Inovasi ialah kejayaan melahirkan idea-idea baru. Dalam pembinaan, inovasi boleh dilakukan daripada penyelidikan dan pembangunan yang dilakukan oleh orang yang terlibat di dalam industri. Terdapat beberapa sekatan terpaksa dihadapi kerana banyak pihak tidak dapat menyesuaikan diri kerana perubahan drastik berlaku kepada inovasi di dalam industri. Tujuan kajian ini adalah untuk mengkaji pandangan profesional pembinaan mengenai isu-isu inovasi dan penyelidikan dan pembangunan dalam industri pembinaan Malaysia. Objektif kajian ini adalah untuk mengetahui keadaan semasa inovasi dan penyelidikan dan pembangunan dalam pembinaan, untuk mengenal pasti kesan inovasi dan penyelidikan dan pembangunan dalam pembinaan dan juga untuk mengenal pasti kehendak responden dan idea mengenai isu-isu yang memerlukan maklum balas dari inovatif pembinaan industri. Empat puluh lapan (48) set borang soal selidik telah dikumpul di kalangan golongan profesional dalam industri pembinaan di Lembah Klang dan Selangor. Soal selidik telah dianalisis dengan menggunakan perisian SPSS bagi keputusan ujian kebolehpercayaan, taburan kekerapan peratusan dan Kepentingan Relatif Indeks (RII). Data kemudiannya dikira dalam jadual dan digambarkan dalam bentuk carta. Hasil kajian ini menunjukkan bahawa jumlah wang yang membelanjakan untuk penyelidikan dan pembangunan dalam pembinaan adalah hanya kira-kira sehingga RM15,000. Inovasi dan penyelidikan dan pembangunan memberi kesan lebih dalam peningkatan produktiviti. Para profesional ingin kelestarian tenaga, bahan dan kaedah daripada inovasi melalui penyelidikan dan pembangunan.

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**LIST OF ABBREVIATION**

CIDB	Construction Industry Development Board
CIF	Community Innofund
CIMP	Construction Industry Master Plan
CRDF	Commercialization of R&D Funds
CREAM	Construction Research Institute of Malaysia
DAGS	Demonstrator Application Grant Scheme
DTI	Department Of Trade Industry
EIF	Enterprise Innofund
EPU	Economic Planning Unit
FTE	Full-Time Equivalent
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on Research and Development
GII	Global Innovation Index
HCD	Human Capital Development
HSE	Health, Safety and Environment
ICT	Information and Communication Technology
IEM	Institute Of Engineers Malaysia
IGS	Industry Grant Scheme
IP	Intellectual Property
IRPA	Intensification of Research in Priority Areas
MASTIC	Malaysian Science and Technology Centre
MGS	Multimedia Super Corridor R&D
MOSTI	Ministry Of Science, Technology and Innovation
NOD	National Oceanography Directorate
OECD	Organization for Economic Cooperation and Development

R&D	Research and Development
RII	Relative Importance Index
RM	Ringgit Malaysia
S&T	Science and Technology
SME	Small and Medium Enterprise
SPSS	Statistical Package for the Social Sciences
TAF	Technology Acquisition Fund
TAFW	Technology Acquisition Fund Women
UK	United Kingdom
USA	United State of America

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## **CHAPTER 1**

### **BACKGROUND OF STUDY**

#### **1.1 Introduction**

In Malaysia, construction industry is one of major industry that contributes to the economic growth development. Every such building activity may create its own unique set of requirements and circumstance. The different sectors including employer, contractors, suppliers and manufacturers, professional have their own interests which are very often divergent and competing in nature.

The construction industry is being increasingly challenged to successfully innovate in order to satisfy the aspirations and needs of society and clients, and to improve the competitiveness. Construction firms often innovate at the project level because their work is always unique, always delivered to bespoke designs, and always achieves something new (Keegan and Turner, 2002). The different sectors including employer, contractors, suppliers and manufacturers, professional have their own interests which are very often divergent and competing in nature.

Innovation has long been recognized as one of the key factors contributing to national economic growth, competitiveness, and higher living standards, and has recently been at the heart of the knowledge-based economy. It is generally accepted that innovation is the implementation of significant new processes, products or management approaches in order to increase efficiency of an organisation (Seaden, 2003).

Research and development (R&D) in construction refer to activities that improve the quality, productivity, efficiency and management of the construction project. R&D is a process to impose innovation to the industry. The improvement of the technology also needs to be considered in order to adapt with the environment concern and statutory requirements. R&D in construction is beneficial in term time and the quality of the end product.

R&D in construction is not referring to generate profit but to make changes in the procedures and technology used. The improvement of the technology also needs to be considered in order to adapt with the environment concern and statutory requirement. R&D in construction is benefit in term time and quality of the end product.

## **1.2 Problem Statement**

More innovation has been done from the research in the construction industry. Some restrictions are also faced by them. According to Ofori (1999), construction industry had many problems and special requirements, there some board in developing countries such as the Construction Industry Development Board of Malaysia (CIDB) and National Construction Council of Tanzania need to improve the their responsible and their levels of authority.

According to Minister of Public Works, Shaziman Abu Mansor in 2009, the innovation in today's industry is very challenges that need to be faced together. The changes happen in Malaysia's construction industry are very drastic until we could not understand it. Therefore, more innovations need to be produce from the private and public sector.

The construction industry, which makes up approximately 2.7% or RM 3.88 billion (3rd Quarter 2006) of our country's Gross Domestic Product (GDP – at current prices), and the multiplying effect it generates on other sectors such as manufacturing, transport, retail, hotel, real estate and restaurants, continues to play an important role in our economy (Gue, 2007).

From MASTIC websites, Gross Domestic Expenditure on Research and Development (GERD) show a continuous increase from 2000 until 2011. In 2011, GERD value reaches RM9, 422 million, which is triple the value of GERD in 2006 which is RM646.70 million. A national R&D activity intensity which is the percentage of GERD to GDP (GERD/GDP) also shows improvement from year 2004. In year 2011 GERD/GDP has achieved 1.07%, an increase of 67.19% compared to year 2006 (0.64%). This achievement achieved the GERD/GDP that set by the Economic Planning Unit, EPU in 10th MP totalled 1.0% towards the year 2015.

From a study (Innovation in the UK: Indicators and Insights, 2006), (Hughes, 1998) states that only 6% of construction enterprises introduced new process innovations in 2005. The problem arose when the innovation in the construction industry is important, but how the innovation affects the construction industry and what is the issues from the parties involved in the industry.

### **1.3 Aim and Objectives of Study**

The aim of this study is to examine the construction professional's view on issues of innovation and research and development in the Malaysian construction industry and the objectives are:

- i) To determine the current state of innovation and research and development in construction
- ii) To identify the impact of innovation and research and development in construction
- iii) To identify the respondent wishes and ideas on issues that require innovative feedback from the construction industry.

### **1.4 Scope of Study**

The scope of research would be focusing on the stakeholders of construction industry which is clients, consultants and contractors. This study will concentrate on projects in the public and private sector. The scopes for respondents were focused on companies located in Klang Valley and Selangor area.

## **1.5 Arrangement of the Report**

The first chapter is background of study, it focuses on the title of this study. It will cover the overview of research and development in construction industry. It also discussed about definition, problem statement, aim, objectives and scope.

Literature review is the second chapter which that focus on some topics that related to this study. These include the definition of research and development, bodies and authorities that lead the R&D in Malaysia, the barrier in implementation of R&D and the ways to encounter the barriers.

The third chapter is methodology of study and this chapter will cover up the detail of the data collection process that involve in this study as primary and secondary data.

Data analysis is the fourth chapter and it indicates the analysing the data to achieve the aim and objective of study includes the presentation of bar chart from the questionnaire distribute.

The last chapter is conclusions and recommendations and this chapter will cover the conclusion and recommendation of the research study. The conclusion and recommendation are based on the whole research study. The recommendations are added for future research

## **1.6 Summary of Chapter**

The study was conducted in order to meet certain interest and will be useful to the parties involved in the construction such as clients, consultants and contractors.

- i) Study the current state of research and development in construction industry in Malaysia
- ii) Examine the impact of innovation in construction
- iii) Collect some ideas from the parties involved and issues arose after the innovation happen.

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