

CRITICAL SUCCESS FACTOR OF GREEN TECHNOLOGY IMPLEMENTATION  
IN BUSINESS DEVELOPMENT IN MALAYSIA

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## **SUPERVISOR APPROVAL**

I hereby declare that I have read this research and in my opinion, this project is adequate in terms of scope and quality for the award of the degree of Bachelor of Technology Management (High Technology Marketing)

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Report submitted in fulfillment of the requirement for  
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## DECLARATION

I declare that this project is the result of my own research except as cited in the references. The research project has not been in any degree and is not concurrently submitted in the candidature of any other degree.

Signature : .....

Name : .....

Date : .....

*To my BELOVED parents,  
family, friends  
and  
to the person who always support me through ups and downs.  
I love you guys.*

## ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and Most Merciful

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## ABSTRACT

Green technology concept reflects on the understanding of the role of technology in mitigating the environmental impacts. In order to achieve competitiveness and sustainability in business development, industry nowadays has growing interests in going through green technology due to encouragement of the government. Construction industry is significant to the global urbanization as it has a vastly impact on the environment especially during construction and operation phase. However, the level of understanding of green technology in the construction industry is still low. The rate of adoption of green technology in the construction industry will increase as increase the knowledge and environmental concern to surroundings. Green technology is costly to be implementing as the clean technology or eco-product is usually expensive rather than normal product. This paper has attempted to identify the level of understanding, implementation and effect of green technology in the construction industry in Malaysia. Indeed, there are several limitations to this research as the research will cover only construction industry because of the time constraint. Due to the wide range of green technology, the research is limited on the critical success factor in the green technology implementation in business development. In general, it can be concluded that industries should be aware of the importance and impact of green technology not only the companies themselves, but to the communities as an order to preserve our earth.

*Keywords: Green technology, implementation, construction industry, Malaysia*

## **ABSTRAK**

*Konsep teknologi hijau mencerminkan pemahaman dan peranan teknologi dalam mengurangkan kesan kepada alam sekitar. Dalam usaha untuk mencapai daya saing dan kemampuan dalam pembangunan perniagaan, industri kini giat memberikan kepentingan untuk melaksanakan teknologi hijau kerana galakan kerajaan. Industri pembinaan adalah penting kepada pemandaran global kerana ia mempunyai kesan yang jauh ke atas alam sekitar terutamanya semasa pembinaan dan fasa operasi. Walau bagaimanapun, tahap kefahaman teknologi hijau dalam industri pembinaan ini masih di tahap yang rendah. Kadar penggunaan teknologi hijau dalam industri pembinaan juga akan meningkat dengan adanya pengetahuan dan kebimbangan terhadap alam sekitar yang mereka ada. Teknologi hijau mahal untuk dilaksanakan kerana teknologi yang bersih atau eko- produk biasanya mahal daripada produk biasa. Penyelidikan ini cuba untuk mengenal pasti tahap pemahaman, pelaksanaan dan kesan teknologi hijau dalam industri pembinaan di Malaysia. Akan tetapi, terdapat beberapa batasan kajian didalam kajian ini. Kajian yang dilakukan ini merangkumi hasil penyelidikan terhadap industri pembinaan kerana kekangan masa. Oleh kerana skop teknologi hijau yang luas, penyelidikan adalah terhad kepada faktor kejayaan kritikal dalam pelaksanaan teknologi hijau dalam pembangunan perniagaan. Secara umum, industri perlu sedar akan kepentingan dan kesan teknologi hijau bukan sahaja syarikat sendiri tetapi kepada masyarakat sebagai usaha untuk memelihara bumi kita.*

*Kata kunci: Teknologi hijau, pelaksanaan, industri pembinaan, Malaysia*



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## CHAPTER 1

### INTRODUCTION

This chapter is explaining about introduction and other major aspect of research. It starts with background of study that draws on what the research is all about, problem statement that clarifies the research questions, research objectives as the aim of the subject field, scope and limitation where the extent of the research on what is being cover and not being cover in the research, the significance of study as what are the reason this research to be done and why the research is important to the researcher and lastly is a summary of the research.

#### 1.1 Background of Study

Green is a symbol of nature, ecology and life that give a positive aura and impact to living things and health. Technology is a realistic concept that applies scientific knowledge for a new process which focuses on the understanding to environment. Dusek V. (2006) states that the tool approach to technology tends to make technology appear neutral. Green Technology is an evolution of environmental friendly that integrates with various kinds of modus operandi and enhancement of product, services, tools, machineries and systems to reduce the bad impact of human activities.

The earth is going to heat up from year to year because of the man-made. Indeed, the demand for energy is rising as fast as population increase especially in developing country such as Malaysia. As said by Shah A. (2012), much of the growth in emissions in developing countries results from the provision of basic human needs for growing population, while emissions in industrialized countries contribute to growth in a standard of living that is already far above that of the average person worldwide. With the backdrop of climate change, global warming, degradation of ecosystem and environmental concern, green technology is being promotes as a counter proposal to this phenomena. According to Volker (2010), it has recognized only too clearly that its competitiveness in the world can be secured through deployment of green technology. Zaini (2012) also pointed that green technology for that matter can be used as environmental healing technology that reduces environment damages created by the products and technologies for people convenience.

Construction industry is very important to the global urbanization (Osman et al., 2012). In the mean time, construction activities also are considered as major contributor to environmental pollution (Augenbroe and Ashworth, 1998). As stated by Palanisamy (2010), construction is one of the largest sectors responsible for high energy consumption, solid waste generation, global greenhouse gases emissions, external and internal pollution, environmental damage and resource depletion. For construction industry, the implementation of green technology is crucial issues towards achieving competitive advantage. According to Goodland (1992), green technology cause minimal negative environmental impact and maximizing positive impacts is an important objective of sustainability environment consists of ecosystem whose ongoing health is essential for human survival on earth.

Green technology has strong potential to develop and growth the business and the global economic. Zainura (2010) states, with the rising cost and threat of global

warming, many businesses are now recognizing the benefits of using technology to reduce their carbon footprint and to minimize waste, while having a positive impact on their business. As the world wrestles with challenges, construction industry have to take this opportunity to implement the green technology and practice it every day during the operation or in business daily routine for future benefit. They have to increase their knowledge and awareness about the role of green technology by obtaining basic information and apply it towards a greener business development. Regarding to the limited application of green technology in the construction industry, Malaysia currently ranks in 26<sup>th</sup> position in the world green leaders sharing the position with Denmark whereby Switzerland and Sweden are the world green leaders (Newsweek, 2008). This indicates that Malaysia is way behind in term of environmental concern. According to Osman, Udin and Salleh (2012), many environmental issues that occur in Malaysia are due to lack of environment considerations in the exploitation, development and management resources as well as lack of control of pollution resources.

Besides, green technology also could be considers as successful as the traditional construction industry that did not implement the green technology can be transforms into modernization construction industry in terms of better utilization of energy and natural resources. It demonstrates a strategic advantage in creating new opportunities for business development implementation. Werbach A. (2009) states that it is about developing and executing a company strategy that takes into account all aspect of sustainability but that is useful enough to be implemented today. The green technology implementation would solve problem by assisting emerging technologies that help the environment by reducing the amount of waste produced.

Therefore, the purpose of this paper is to discuss the issue of the level understanding and awareness on green technology and to determine the implementation and the effect of implementing green technology in construction industry in Malaysia. It



is also believed that the results of this study would lead to recommendation proposal for the improvement of green technology implementation of construction industry in Malaysia.

## **1.2 Problem Statement**

Green Technology also known as ‘Green Tech’ has become a new trend for business development as it is one of the factors for the construction industry to achieve a competitive advantage. Every industry keeps on discussing about reducing greenhouse gas emissions and practicing better utilization of energy to improve the environment for all forms of life in an industry. Therefore, the Malaysia government has started to implement several actions in response to green technology by introducing legal acts, taxation, incentives and other actions that should be taken to increase awareness in implementing it. However, the level of understanding regarding green technology remains unclear. To be specific, certain people in the construction industry understand and are aware in response to green technology but others remain vague due to many factors. In fact, the effect of green technology that is being implemented in business development is still obscure. Therefore, the implementation of green technology in the construction industry will be determined to gain the impact of having that kind of green technology application.

### **1.3 Research Questions**

- i. What is the level of understanding of construction company on green technology?
- ii. What is the construction company implementation towards green technology?
- iii. What is the effect of green technology in construction company?

### **1.4 Research Objectives**

Based on research questions, there are three objectives has being construct to be achieve in this research.

- i. To investigate construction company understanding on Green Technology.
- ii. To determine construction company implementation towards Green Technology.
- iii. To identify the effect of Green Technology in construction company.

### **1.5 Scope**

The scope of the research is limited on the area of green technology implementation in construction industry in Malaysia. To be specific, the construction company that will be cover is situated in Melaka. This construction company is being chosen by researcher because it has the criteria of green technology concept which suits with researcher research project. In terms of respondent, researcher will interview the higher level management and several employees which is the low level worker in the company by considering the knowledge on green technology to ensure the validity and

reliability of the results. The research is attempted to focus on the understanding of green technology, the implementation of green technology and the effect of green technology to the construction company. It is ideal time to measure the awareness, knowledge, behavior and actions to be taken and so this indicator would help the construction company to maintain their work performance towards clean and peace environment.

### **1.6 Limitation of Study**

The study is limited to several areas to ensure the reliability and the validity of the research. Due to the wide range of green technology, hence, it limits the research on the level of understanding, implementation and effect of green technology. Due to a time constraint, only one construction company will be cover in this research. According to theory of constraint, every system no matter how well it performs has at least one constraint that limits its performance. Other than what has been stated in the scope is not being cover in this research.

### **1.7 Significance of Study**

Continuation and acceleration of the traditional way of business activity will give a negative impact to our environment if serious actions are not being taken. The connection between environment and human are close as it is behalf of our life and responsible to taking care of environment. In order to achieve competitive advantage In business development, conserving the environment towards healthier lifestyle has

become a crucial issue. Therefore, green technology has become a new direction for the world in protecting the earth. To implement green technology in business development is very difficult as a start as it involves controlling and maintaining the achievement brought within the firm. In addition, it also involves large investment to implement it. This research is useful in the future as it can be a template for construction industry that concerning which direction that will lead them to the easiest way to make green technology as a success and become competitive. Besides that, this research also will bring benefit to the construction company as it will encourage them to keep on implementing the green technology to achieve competitive advantage in business. By this implementation, it will help the company to expand their market which other company from other country will demand for green goods or services and technologies. Hence, the result of this study benefits both government and market participants for improvement, application and implementation of green technology in construction industry in Malaysia.

## **1.8 Summary**

Chapter 1 is the development of framework for the project. It works as a guideline for researcher to ensure that the research is aligning with the research objective. There are three main issue that researcher will focus that is the understanding of green technology, the implementation and the effect of green technology in business development of construction industry in Malaysia.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

In this literature review, an overview of analysis from previous or recent research will be related to fit with researcher topic. Normally, literature review is start with the broad issue then become more specific and focuses to the topic. It will compile all important citation of all authors from books, journal, newspaper, magazine, articles etc. All citation should state the author name as it indicates the sources of original researcher from the secondary data sources. Besides, researcher uses relevant literature to support the discussion on the topic of the research. In other words, in a literature review, the literature itself is the subject of the discussion.

## 2.2 Green Technology Implementation

It is a fact that there are many advantage could be obtained from green technology implementation. Nevertheless, it becomes a question why it is however not widely implemented despite knowing the benefits of it. Green technology is sort of global technology which may not require advanced technology skills to support it. According to KeTTHA (2010), green technology is the development and application of products, equipment and systems used to conserve the natural environment and resources which minimize and reduces the negative impact of human activities. Green technology refers to products, equipment or systems which satisfy the criteria of minimizing the degradation of the environment, zero or low green house gas (GHG) emission and promotes healthy and improved environment for all form of life, conserves the use of energy and natural resources and promotes the use of renewable resources.

In a firm, it involves the basic human knowledge, skills, an environmental concern which are naturally and friendly to the environment. Without realizing, activities that are commonly practice in daily business operation are actually practicing the green technology for example such as energy consumption, water and waste management, building, transportation, eco-products and services. By altering the daily business activities to green way, it helps in save the world follow the benefit resulting from practicing the green technology.

Zainura (2010), states that the future of technology is most definitely green. With rising energy costs and threat of global warming, many businesses are now recognizing the benefits of using technology to reduce their carbon footprint and to minimize waste, while having a positive impact on their business. Volker (2010), also states that it has

only too clearly that its competitiveness in the world can be secured through deployment of green technology. According to Bakar (2011), green technology might bring to entrepreneur by complying with new business success factors particularly in term of green demand and supply among the Malaysian companies. Green technology is necessary in long term duration.

According to Goh (2012), from New Straits Times, green business could benefit from greater long-term support, particularly in assisting entrepreneurs to develop comprehensive business plans and cash flows projections. Khaliq (2008) expressed that leaders should implement green management to achieve green technology. These mean that without proper management, great ideas cannot be implemented in order to achieve green technology. In the implementation part, support from the technology, financial and other relevant organizations must be strong enough as to ensure that the positive impact of green technology is materialized (Yusof et al., 2013).

The most challenging issues about green technology implementation are the cost of the construction of green building. According to Langston (2001), in quantifying the costs of green construction, two factors need to be considered that is the initial outlay for the building and the payback period which the time it takes to pay back the additional sustainability features of the building. Green construction cost is higher compared to the conventional construction due to the factor of materials and products, green design, computer energy modeling, life-cycle costing and post-occupancy evaluation. He also stated that the greener the project, the higher the cost will be involve.

### **2.3 Technology Acceptance Theory – Perceived Usefulness (PU)**

Some studies are trying to use one specific model or theory and some try to compare and combine to get accurate results. Theory of technology acceptance (TAM) is a model that suggests how people or users come to accept and use a technology. Based on TAM model, perceived usefulness (PU) is defined as the degree to which a person believes that using a particular system would enhance his or her job performance (Davis et al. 1989). In other words, green technology will be beneficial to people in a firm in progressing their business development. In a research of the role of social influence on adoption of high tech innovation, Kulviwat et al (2007) prove that people may adopt high technology products not only to obtain useful benefits but also to enjoy experience of using them.

### **2.4 Technology Acceptance Theory – Perceived Ease of Use (PEU)**

Perceived ease of use is also being constructed in TAM theory. Davis (1989) defined PEU as the degree to which a person believes that using particular system would be free from effort. In this context, perceived ease of use represents the extent to which a firm associate freedom of difficulty with the adoption of green technology. Venkatesh and Davis (2000) in their research demonstrate that individual employ the system to achieve better social status and increase the quality of their job performance. Therefore, the green technology helps in ease an industry in developing their business. By using specific technology also will lessen the additional work and energy needed.