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PSM THESIS

**“The Adoption and the Implementation of Best Practice in
Malaysia Biotech Manufacturing Industry”**

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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SESI PENGAJIAN : 2007 / 2008

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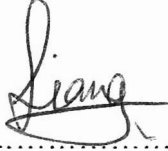
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I hereby, declared this thesis entitled “The Adoption and the Implementation of Best Practice in Malaysia Biotech Manufacturing Industry” is the results of my own research except as cited in references.

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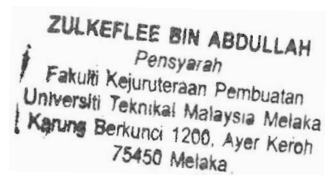
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ABSTRACT

Best practices are leadership, management, or operational methods or approaches that lead to exceptional performance. Even though, there are a lot of researches and findings show the success of benchmarking or best practice, but there are few companies that not adopt or are not successful in the implementation of best practice. The purpose of this study is to find the factors that most influence the manufacturers to adopt the best practice in Malaysia biotech manufacturing industry. Therefore, focus could be paid on these factors to find the right partner and avoid wasting resources while doing benchmarking project. Moreover, the relationship between implementation success of the best practice that the organization had adopted and the performance improvement of the organization as a result of implementation on these best practices is also to be found out. The population of the study is 64 companies that were registered under Biotech Division, Ministry of Science, Technology and Innovation and ONLY 8 QUESTIONNAIRES RETURNED from the respondents WERE analyzed USING SPSS .From this study, it was found that the three major factors that would affect the decision making in best practice adoption were the perceived benefits (increase quality and improve overall operational performance) of the best practice itself, organizational culture (change is viewed positively) of the company and perceived outside supports (availability of outside training). On top of that, the relationship between implementation success level and performance improvement level as a result of implementing the best practices was found positively related.

ABSTRAK

Teknik terbaik adalah kepimpinan, pengurusan, cara-cara perjalanan yang menyumbang kepada hasil keputusan yang baik. Walaupun terdapat banyak kajian dan keputusan menunjukkan pengajian teknik terbagus yang berjaya, malah ia masih terdapat syarikat-syarikat yang tidak mengamalkan pengajian teknik terbagus atau gagal dalam melaksanakan teknik terbagus itu. Penyelidikan ini adalah bertujuan untuk mencari faktor-faktor yang paling mempengaruhi para pengilang untuk melaksanakan teknik terbagus tersebut dalam industri biotek Malaysia. Selain tu, perhatian juga diberi kepada faktor-faktor tersebut untuk mencari syarikat sekerja yang betul dan seterusnya menghalang syarikat daripada membazir sumber-sumber semasa menjalankan projek pengajian teknik terbagus. Dalam penyelidikan ini juga, hubungan kait antara kejayaan pelaksanaan teknik terbagus dan peningkatan prestasi syarikat hasil daripada pelaksanaan teknik terbagus itu DIKENALPASTI. Populasi penyelidikan ini adalah 64 buah syarikat yang didaftarkan di Bahagian Biotek, Kementerian Sains, Teknologi dan Innovation, dan 8 soal selidik daripada 8 buah syarikat dikutip dan dianalisis. Keputusan yang didapati menunjukkan tiga faktor-faktor utama yang mempengaruhi keputusan untuk melaksanakan teknik terbagus adalah kebaikan yang dirasai (peningkatan kualiti dan pencapaian operasi syarikat) daripada teknik terbagus itu sendiri, budaya syarikat (pengubahsuaian dianggap positif dalam syarikat) dan sokongan luaran didapati (kewujudan latihan luaran). Di samping itu, kejayaan pelaksanaan teknik terbagus didapati BERHUBUNGKAIT dengan peningkatan pencapaian prestasi syarikat.

DEDICATION

To my father and mother, teachers, family's members and all my friends who always helped me when I was in the darkest corner.

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TABLE OF CONTENTS

Declaration.....	ii
Approval.....	iii
Abstract.....	iv
Abstrak.....	v
Dedication.....	vi
Acknowledgements.....	vii
Table Of Contents.....	viii
List Of Figures.....	xi
List Of Tables.....	xii
List Of Abbreviations, Symbols, Specialized Nomenclature.....	xiii

CHAPTER 1 : INTRODUCTION

1.1 Background of the Study.....	1
1.2 Statement of the Problem.....	3
1.3 Objective of the Study.....	4
1.4 Framework of the Study.....	5
1.5 Scope of the Study.....	6

CHAPTER 2 : LITERATURE REVIEW

2.1 Definition.....	7
2.1.1 Biotechnology.....	7
2.1.2 Process and Practice.....	7
2.1.3 Benchmarking and Best Practices.....	8
2.2 Best Practice Factors.....	9
2.2.1 Codification.....	9
2.2.2 Complexity.....	9
2.2.3 Compatibility.....	9
2.2.4 Perceived Benefits.....	10
2.2.5 Cost.....	11

2.3	Organization Factors.....	12
2.3.1	Top Management Support.....	12
2.3.2	Absorptive Capacity.....	12
2.3.3	Satisfaction with the Existing Practice.....	13
2.3.4	Innovativeness of Organization Culture.....	13
2.3.5	Organization Resource Availability.....	14
2.3.6	Existence of a Champion.....	14
2.3.7	Size.....	14
2.4	Environment Factors.....	16
2.4.1	Environmental Barriers.....	16
2.4.2	Vertical Linkages.....	16
2.4.3	Perceived Outside Support.....	16
2.4.4	External Pressures.....	17
2.5	Best Practice Adoption.....	18
2.6	Implementation Success of Best Practice.....	19

CHAPTER 3 : HYPOTHESES

3.1	Hypotheses.....	21
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CHAPTER 4 : METHODOLOGY

4.1	Methodology's Framework.....	23
4.2	Sampling.....	25
4.3	Construct Measurement.....	26
4.4	The Questionnaire.....	27
4.5	Survey Administration.....	28
4.6	Analysis.....	29

CHAPTER 5 : RESULTS

5.1	General Information About Respondents.....	30
5.2	Best Practice Factors.....	32
5.3	Organization Factors.....	35
5.4	External Factors.....	39
5.5	Implementation Success and Performance Improvement.....	41

CHAPTER 6 : DISCUSSION

6.1	Factors Affecting Best Practice Adoption Decision.....	43
6.2	Implementation Success of Best Practice and Performance Improvement.....	48

CHAPTER 7 : CONCLUSION

7.1	Conclusion.....	50
7.2	Contribution and Limitation.....	51
7.3	Suggestion.....	52

REFERENCES

APPENDICES

- A Cover Page of questionnaire.
- B Questionnaire.

LIST OF FIGURES

1.1	Framework of the Study	5
4.1	Flow Chart of Methodology	24
6.1	Graph of Implementation Success Variable Versus Performance Improvement Variable	49

LIST OF TABLES

5.1	General Information about Companies and Best Practices Adopted	30
5.2	General Information Companies' Size and Employees	31
5.3	Best Practice Factors – Codification	32
5.4	Best Practice Factors – Complexity	32
5.5	Best Practice Factors – Compatibility	33
5.6	Best Practice Factors – Cost	33
5.7	Best Practice Factors – Perceived Benefits	34
5.8	Organization Factors - Management Support	35
5.9	Organization Factors - Organizational Culture	36
5.10	Organization Factors - Absorptive Capacity	36
5.11	Organization Factors - Satisfaction with Existing Practice	37
5.12	Organization Factors - Available Resource	37
5.13	Organization Factors - Existence of Leader	38
5.14	External Factors - External Pressures	39
5.15	External Factors - Environmental Barriers	39
5.16	External Factors - Perceived Outside Support	40
5.17	External Factors - Vertical Linkages	40
5.18	Implementation Success	41
5.19	Performance Improvement	42
6.1	Summary of High Selected Best Practice Factors' Results	43
6.2	Summary of High Selected Organization Factors' Results	45
6.3	Summary of High Selected External Factors' Results	47
6.4	Summary of High Selected Implementation Success and Performance Improvement's Results	48

LIST OF ABBREVIATIONS, SYMBOLS, SPECIALIZED NOMENCLATURE

APQC	-	American Productivity and Quality Center
et al.	-	and other people
etc		etcetera (and so on)
FDI		Foreign Direct Investment
FMM	-	Federation of Malaysian Manufacturers
ICT		Information and Communication Teknology
ISO		International Standardization Organization
MOSTI	-	Ministry of Science, Technologies and Innovations
RMK 9	-	Malaysian 9 th Plan, 2006-2010
SMI	-	Small and Medium Industries
TQM		Total Quality Management
UTeM	-	Univeriti Teknikal Malaysia Melaka

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

As the world recognizes that Malaysia nowadays is a developing country and the manufacturing sectors contribute a huge portion of the economy of the country. Therefore, Malaysians are in an industrial society, focusing in the production of goods. However the emersion of neighbouring countries, such as China, Thailand and Vietnam where have the privilege of lower labour costs compared to Malaysia. Malaysian government has foreseen the problem and struggled to remain the foreign direct investment (FDI) in Malaysia. On of the possible ways to maintain the competency of Malaysia's products is through efficient production and high quality products. While building upon established clusters of industries to produce next generation products, efforts will be made to enhance the development of new sources of growth, largely science-based and innovation-based activities, especially biotechnology and ICT industries to diversify and broaden the manufacturing base. (RMK 9, 2006)

According to Ungan, M.C.(2002), one of the potentially efficient ways to improve a process is to identify and adopt best practices that were developed elsewhere and have produced superior results. This approach, commonly referred to as benchmarking, has been widely scrutinized by practitioners since the early 1990's. However, in Malaysia alone, many research-based studies were done, but the adoption of best practices is not as high as might be expected, especially in small and medium

industries (SMI). Although there is enough research evidence that scores of companies are involved in benchmarking to identify best practices, these organizations are generally not willing to adopt or are not successful in implementing their findings (The Benchmarking Exchange, 2001, Davies and Kochar, 1999).

The term of best practices used in benchmarking is not absolute and it is a relative term. According to the American Productivity and Quality Center, APQC (1993), best practices are leadership, management, or operational methods or approaches that lead to exceptional performance. Examples of best practices includes : Total Quality Management, Quality Management Systems, Lean Manufacturing, Cellular Manufacturing, Synchronized Scheduling, Six Sigma,...etc. Based on the literature (Rogers, 1983, Tornatzky and Fleischer, 1990), the context of a best practice adoption factors are: (1) characteristics of the innovation or best practice; (2) characteristics of the environment in which the organization operates; (3) characteristics of the organization; and (4) characteristics of the organization decision makers.

1.2 STATEMENT OF THE PROBLEM

For developed countries such as US, benchmarking is widely used by companies. Many *Fortune 500* companies and other large organizations have embraced benchmarking as an important, systematic methodology for achieving the organization's strategic objectives (APQC, 1995). According to a survey conducted by Kumar and Chandra (2001), 50 out of 93 US manufacturing companies had been involved in benchmarking. However, only half of 1498 benchmarking projects ended up with actual process improvement (Benchmarking Exchange, 2001).

In Malaysia, the situation is not clear, whether the local manufacturers are not aware of the possible benefits brought by the implementation of best practices or there are reasons that blocking them to adopt best practices in their organizations. From the study done by Ungan, M.C., 2002, three important research questions were raised:

- (i) *What factors have an impact on the adoption decision of best practices?*
- (ii) *What factors have an impact on the implementation success of best practices?*
- (iii) *Does best practices implementation lead to performance improvement?*

For the Ninth Plan period of Malaysia, in meeting a more challenging and competitive global environment, a crucial goal will be to upscale the manufacturing sector towards higher value added activities and upgrade capacity in the provision of related services (RMK 9, 2006). For Malaysia to become one of the first choice countries in asia pacific region that produce high quality product that will satisfy the end users and for the meanwhile maintaining the competency as a developing country with attracting operation costs to attract foreign investment, more local companies should adopt best practices in their organizations. This study aim to provide a reference for decision makers to adopt the best practices by taking into account several factors involved.

1.3 OBJECTIVE OF THE STUDY

The purposes or the main objectives of this study are :-

- a) To identify major factors that most affect the best practices adoption decision in biotech manufacturers in Malaysia and consequently prevent companies from wasting their resources in doing benchmarking projects.
- b) To find the relationship between implementation success and performance improvement as a result of implementation on these best practices.

1.4 FRAMEWORK OF THE STUDY

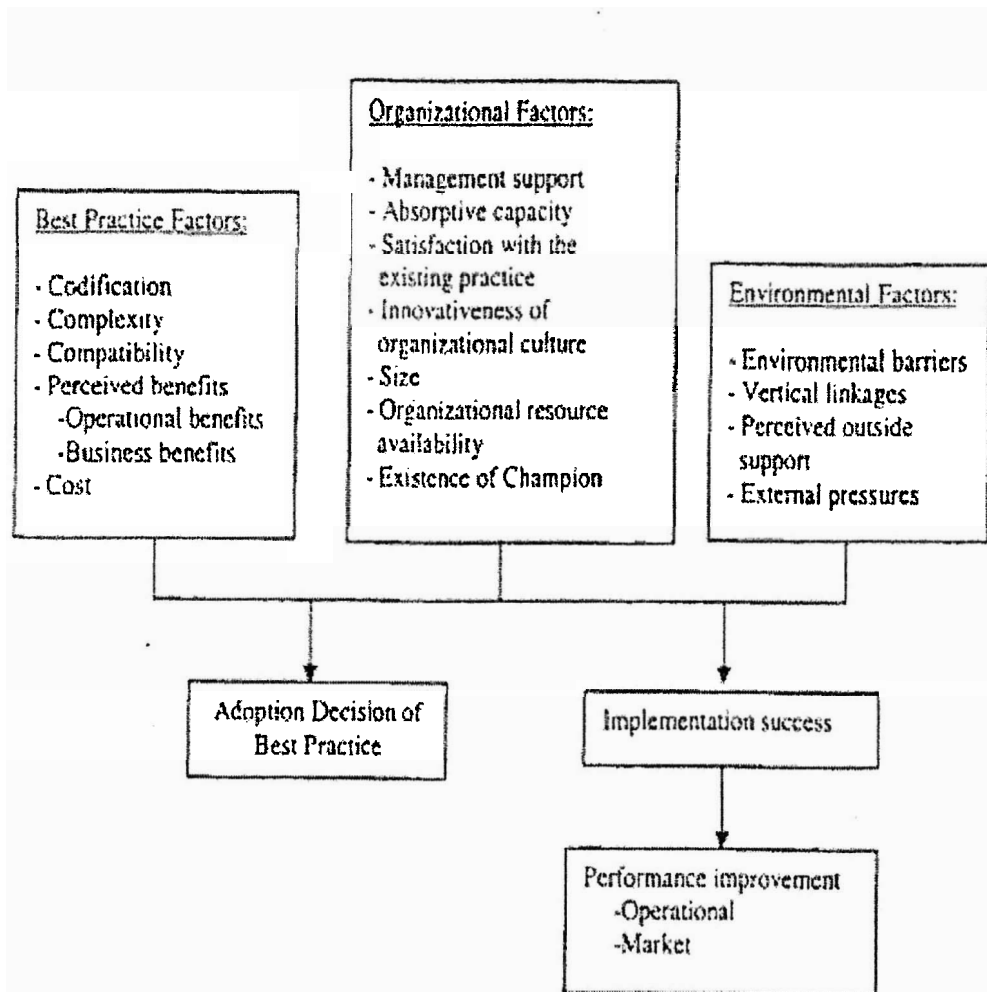


Figure 1.1 : Framework of the Study

(Source : Research model above adopted from Ungan, M.C.,2002)

1.5 SCOPE OF THE STUDY

The demographic data as well as the gender of the participants in this study are neglected. Therefore, the historical background, hometown cultural and previous experiences of each participant, who represented the organization to answer the questionnaire, are not taken into account in this study. The data is collected in biotech manufacturing industries selected in Malaysia. Thus, the result analyzed is applicable to that particular industry as reference only. For other industries, there might have happened bias in the result found. As time passes by, the selection of participant might change due to changing external factors and consequently the result analyzed before is not appropriate enough. The study needs to be carried out regularly to update and follow the current situation.

CHAPTER 2

LITERATURE REVIEW

2.1 DEFINITION

2.1.1 Biotechnology

The United Nations Convention on Biological Diversity (1992) had come up with one of the definitions of biotechnology is it means any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use. It is a popular term used in 21st century, new technology based on biology, especially when used in agriculture, food science, and medicine. Many people find biotechnology to be beneficial from an economic and biological perspective (Conko, 2003, McGlouphlin, 1999). According to The Biotechnology Market Outlook (2005), the biotech sector has shown rapid growth in year 2000 to 2004, with global revenues rising from \$22.7 billions in 2000 to \$44.3 billions in 2004.

2.1.2 Process and Practice

A process is simply a sequence of work steps that describes what is done to meet an objective. Meanwhile, a practice describes how the step is done in the process.

American Productivity and Quality Center, APQC (1993) stated that business practices are methods or approaches that facilitate the execution of a process. For an example given by Ungan, M.C.(2002), internal assessment is a business process. A business practice is to base the criteria for internal assessment on the Malcolm Baldrige National Quality Award Criteria. Another business practice is to use ISO 9000 as the standard for assessment of product quality assurance. The other example is the development of new product design is a process, while ensuring that customer input is used to define product features is a practice (APQC, 1993).

2.1.3 Benchmarking and Best Practices

According to Watson (1993), benchmarking is a continuous search for, and application of, significantly better practices that lead to superior competitive performance. A more operational definition of benchmarking is “the process of continuously measuring and comparing one’s business processes against comparable processes in leading organizations to obtain information that will help the organization to identify and implement opportunities (Andersen and Petterson, 1996). The objective of any benchmarking endeavor is to identify and adopt best practices to improve process and performance. For the meaning of “best practice” stated before, American Productivity and Quality Center, APQC (1993) had defined best practices are leadership, management, or operational methods or approaches that lead to exceptional performance. In another study of the American Productivity and Quality Center (1995), best practices are recognized as the cause of best performance and it is noted that studying them provides the greatest opportunity for gaining strategic, operational, and financial advantage. However, best practice is a relative term instead of an absolute standard. It depends on many factors and current situation.

2.2 BEST PRACTICE FACTORS

2.2.1 Codification

According to Hansen (1999), codification means the degree to which the knowledge is fully documented or expressed in writing at the time of transfer of knowledge between a subunit and the receiving element in another subunit. He also stated that knowledge with a low level of codification corresponds closely to the concept of tacit knowledge: that is, knowledge that is hard to articulate or can only be acquired through experience. Codification, which is the degree to which knowledge associated with the best practice can be written down and mapped out, if done properly might ease knowledge transfer between subunits.

2.2.2 Complexity

According to Betty, Shim, and Jones (2001), complexity is defined as the degree of difficulty in understanding the innovation. When the best practices are complex, the knowledge associated with them is dispersed across many individuals, routines, and techniques, therefore they may be hard to understand and difficult to implement. However, Premkumar (1999) found that complexity was not a significant variable in discriminating between the adopters and non-adopters in the adoption decision of telecommunication technologies.

2.2.3 Compatibility

Thong (1999) studied the factors influencing the adoption and extent of adoption of information system in small business. He described compatibility as the degree to

which an innovation or practice is perceived as consistent with the existing values, needs, work practices, and past experiences of potential adopter. He found that compatibility was positively related to information system adoption in small business. This is undeniable that compatibility has become one of the key issues to examine whether the practices will actually work in the adopting organization during the evaluation of the best practices.

2.2.4 Perceived Benefits

Elmuti (1998) presented the reasons for benchmarking based on his survey-based research. The most important ones listed are cost reduction, productivity improvement, quality improvement, profitability improvement, customer service improvement, process improvement, market share protection, getting ahead of competitors, gaining a competitive advantage, open up an opportunity for growth, and enhancing job satisfaction. The same study revealed the primary goals of benchmarking processes. These are performance improvement (e.g., profit margins, return on investment, sales per employee), quality improvement (e.g., percentage of defects and defect rates), productivity improvement (e.g., efficiency rate, cycle time reduction), customer service improvement, market share increase, and business process improvement (e.g., waste delays, empowerment, and job satisfaction). Moreover, the other benefits listed are improved customer satisfaction, improved reliability of operations, greater cost savings, improved respond time, greater product innovation, greater number of repeat customers, improved decision making, and setting of realistic and achievable goals (Brah, Ong, and Rao, 2000). These benefits formed a reliable scale with an alpha value of over 0.8.