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An Evaluation of Research and Practices Industrial Production Technology in Manufacturing

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ABSTRACT

This paper is based on a survey conducted on awareness and understanding an evaluation in Indian industrial production Technology in manufacturing Process. The main objective of this paper is to provide empirical evidence on top management's awareness and understanding of an evaluation of technique and its role towards business survival and competitiveness. The survey results and findings revealed that almost 20% are in the very good category, about 50% of the respondents companies are still in the moderate category, nearly 18% are in the low category and 12% have very little understanding and knowledge as regards to an evaluation. In summary, the survey analysis showed large majority of the Indian production Process involves in the manufacturing sector still experiencing lack of knowledge as regards to an evaluation of concept and its role towards enhancing their business process effectiveness and competitiveness.

Keywords: An evaluation, Competitiveness, Survey, Performance, Survival

I. INTRODUCTION

In this day and age, stiff competition, technology advancement and the globalisations of markets, most of the companies have been forced to consider and implement a wide variety of innovative management philosophies, approaches, and techniques (Lee et al. 2006). The globalisation of markets, growing interdiffusion of economies, and increased inter-dependence of economic agents are reshaping national and international competitive environment and economic performance (Ghobadian and Gallear, 1996; OECD, 1993). These fundamental changes are prompting the far-sighted organizations to re-examine and modify their competitive strategies. To survive in the global competition and the ever-increasing customer demands, local business organizations must demonstrate the ability to understand and assess things quickly like their international competitors. Competitive analysis has been utilized by organizations for decades as a way of collecting data and measures regarding the markets, sales, products, production costs, or budgets of competitors (Yasin, 2011). Gathering intelligence about competitors is not a new idea. Historically, industries growth and development has been advanced by imitation of technology, business practices and organizations of the other countries. Bolton (1993) as quoted by Drew (2017) describes how industrialization in the United States of America benefited from imitating and exploiting Britain's knowledge of technologies such as metallurgy and steam engine. For example, in the mid 1880s, American engineers visited Britain, copied and made major changes to British engines to adapt them to different fuel prices and the characteristics of North American Rivers (Drew, 2019).

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II. WHY AN EVALUATION IS NEEDED

An Evaluation and implementation can be a major business investment. Due to this fact, Dattakumar and Jagadeesh (2003) had listed and compared several literature reviews on an evaluation . From their study, they highlighted the essence, focus and objective of all these literatures on the an evaluation .They found that the focus of an evaluation literature has shifted and addresses issues on improving the an evaluation process such as in-depth study of an evaluation to identify the missing links. Watson (1993) had highlighted the elements that the companies must have in order to overcome the global competition and linearization of national economies.

The elements are: quality beyond the competition; technology prior to the competition; and costs lower than the competition. In other words, many companies must provide a superior, faster and cheaper services or products than their competitors. To achieve this goal, an important evaluation process can be done to achieve perfect tool for making improvement of current products and services and also innovation of new products and services. Further to this, Kempner (1993) held the view that the goal of an evaluation is to provide key personnel in charge of processes with an external standard for measuring the quality and cost of internal activities and thus helps to identify where opportunities for improvement might be found.

III. RESEARCH METHODOLOGY

In Research methodology, a survey methodology was used to obtain general overall information on evaluation of awareness, understanding and adoption among Indian SMEs involved in the Production technology manufacturing sector.

The Survey Objectives are

i. The Survey on Instrument Development
ii. Expert Validation and Pilot Study of Survey Instrument
iii. Population and Sampling Procedure for the Study

A) THE SURVEY ON INSTRUMENT DEVELOPMENT

A prerequisite in designing a good questionnaire is to decide what to measure. In most cases, the cheapest alternative in a survey process is to improve questionnaire quality compared to significantly increasing the sample size. The survey questionnaire in this study was developed based on previous evaluation of empirical studies found in the literature and using the general rules as provided by Fowler (1998) on questions and answers basic characteristics, which are fundamental to a good measurement process. A set of survey questionnaire was carefully designed to ensure most of the pertinent issues concerning evaluation process were included.

The final form of the postal survey questionnaire consisted of two (2) main sections, which comprise of general information and general opinions. The general information section was intended as a foundation to determine fundamental issues such as company years in business, type of company ownership, company flexibility, company size according to the number of employees, annual sales revenue, type or group of product supplied or manufactured, quality assurance certification, source of knowledge.

The objective of this section is to indicate the respondents' level of awareness, understanding and knowledge of the major aspects for the Instrument Development.

B) EXPERT VALIDATION AND PILOT STUDY OF SURVEY INSTRUMENT

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The pilot study was performed by sending-out the final draft questionnaire to an evaluation experts and an evaluation practitioners (such as executive directors, managing directors, manufacturing managers, operation managers, production managers and quality managers), who had the relevant expertise and experience in an evaluation implementation for validation, comments and suggestions on the survey questions clarity and appropriateness. It is in line with many researchers' statement who believed that top management was one of the most important factors for any management practice adoption in the company (Agus et. al., 2001; Sohail and Teo, 2003; Deros, 2004; Lee et al., 2006). The comments and feedback given were very useful in rectifying and improving the instrument. Most of the comments and suggestions received were carefully analysed and based on the analysis a few minor modifications were made on the questionnaire. Majority of the an evaluation experts gave a positive remark where they commented that the study is an interesting project worth researching.

C) POPULATION AND SAMPLING PROCEDURE FOR THE STUDY

In order to limit the scope of the study, the target population selected for the study was only consisted of executive directors, managing directors, manufacturing managers, operation managers, production managers and quality managers in automotive companies as opposed to wider range of manufacturing industries. They were chosen as the population of the study because they directly involved in the process, have first-hand knowledge and experience of an evaluation implementation in these companies. The study was focused on vendors of the Indian automotive industry. The authors believe that it is crucial to investigate and find out the from those who have an understanding and practical experience in an evaluation implementation and adoption. The sample for the survey consisted of 350 companies, which were randomly selected from the Indian automotive industry first and second-tier vendors lists. A questionnaire was mailed to the top management of each company. A reply-paid self-addressed envelope was included. A total of 65 companies responded to the questionnaire, giving a response rate of about 19% For comparison, a postal survey on 400 manufacturing companies in the United Kingdom by Reed et al. (2001) also received a low response rate of 5.5% Another 11 of the questionnaire were returned due to companies having moved to new locations or ceased operations. Given the low response associated with mail surveys, this response rate was considered reasonably adequate.

IV. SURVEY RESULTS AND FINDINGS

Profile of the Respondents

The majority (i.e. 78%) of the respondents companies, which involved in the automotive components manufacturing sector, were completely owned by Indian (see Figure I). Meanwhile, the remainders 22% of the companies were on joint venture basis between local entrepreneurs and foreigners.

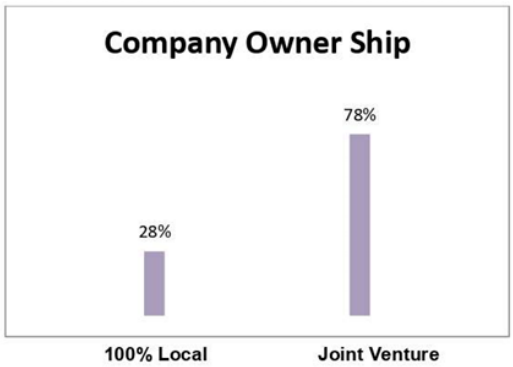


Table 1 shows the best example for the distribution of products types manufactured by the respondents' companies in india. It can be seen that 43.9% are producing metal parts, 21.2% plastic parts, 16.7% electronic parts, 15.2% electrical parts, 13.6% rubber parts, and 24.2% other parts (i.e. comprise of carpet,

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lamps, glass, oil, paint, etc.)Of the industry. The results indicate that the respondents were producing many types of products and employing various manufacturing techniques. Thus, the survey results can be considered as a representative sample of the general vendor population in the Malaysian automotive manufacturing sector.

Table 1: Types of Products Manufactured

Products Manufactured	Number of companies	Percent
Plastic parts	14	21.200/0
Electronic parts	11	16.70%
Electrical parts	10	15.20%
Rubber parts	9	13.60%
Metal parts	29	43.90%
Other parts	16	24.20%

With regards to quality system certification, about 82% of the respondents had at least one certification in place (see Table 2). However, as shown in Table 2, it is quite surprising to discover that more than 18% of the respondents did not have any quality certification. When examining the results in more detail, it was found that 77% (ISO 9000:2000), and 13.8% were certified to other types quality standards. In addition, it is also quite surprising that only about 30% of the respondents have the more stringent QS 9000 even though it has almost become a requirement for companies involved in the automotive industry.

Table 2: Types of Quality System Certification — Overall

Quality Systems	Number of Companies	Percentage
ISO 9000:2000	60	
QS 9000:2000	18	
Others	9	13.80%
None	12	18.50%

Regarding to an evaluation knowledge, Figure 2 shows almost 71 % of the respondents have some prior knowledge before embarking on the an evaluation initiatives acquired through seminar, conference, workshop, training or the mass media. Meanwhile, 27% had embarked in an evaluation activities through "trial-and-error" due to their lack of knowledge of the an evaluation technique and 2% were did not know or unsure how to response.

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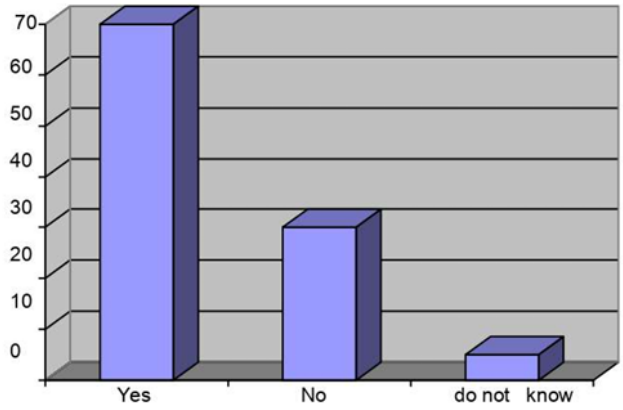


Figure 2: Prior Knowledge on An evaluation

Table 3: Types of Evaluation Initiatives Implemented — Overall

S.No.	An evaluation Initiatives Implemented	Number of companies	Percent
1	Knowing and understanding own process	39	59.10%
2	Establishing an evaluation measures	22	33.30%
3	Education and training in an evaluation	18	27.300/0
4	Identifying an evaluation partner	18	27.30%
5	Employee involvement in an evaluation	14	21.200/0
6	Developing an evaluation strategies		21.200/0
7	Setting-up a an evaluation unit	13	19.70%

Referring to Table 3, the four an evaluation initiatives with the highest implementation rate ranked in terms of percentage are knowing and understanding own process (59.1 %), establishing an evaluation measures (33.3%), education and training in an evaluation (27.3%) and identifying an evaluation partner (27.3%).

V. CONCLUSIONS AND LIMITATIONS

In the demographic data analysis, this study indicates that majority of the respondents are Indian owned companies involved in the automotive components manufacturing sector. The findings from the postal survey revealed that a large majority (i.e. 75%) of the companies have less than five years of experience. In other words, majority of them are still in the early stage of the benchmarking implementation effort and the benchmarking technique is still new in Indian automotive manufacturing companies. This is further evidenced by the fact that about 60% of the companies had just started implementing at least one initiative (i.e. knowing and understanding own process) out of the seven evaluation initiatives for full implementation. In other words, these survey results shows that 83% of Indian companies involves in the automotive manufacturing sector still experiencing lack of knowledge as regards to the eveluation concept and its role towards enhancing their business process effectiveness and competitiveness. It is therefore crucial to improve their knowledge and awareness of the Evaluations role in their pursuit to become more efficient in their business processes and thus enhance their ability to compete in the market place. In other words, the study revealed that there is a lot to be done in encouraging more companies to use the benchmarking technique in their pursuit to be more competitive in the local, regional and global market and survive the stiff competition

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in the market place. To achieve this, the Indian government through its agencies such India Productivity Corporation could intensify their efforts in promoting awareness and usage of the evaluation technique by conducting seminars, workshops, road-shows, education and training, publishing adicles in the local mass media related to the benchmarking concept. The survey methodology used in this study has several limitations. The results presented in this paper are a part of an on-going research on evaluation and implementation in Indian manufacturing process.

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