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INDUSTRIAL BENCHMARKING: A CRITICAL RESEARCH AND PRACTICES IN AUTOMOTIVE MANUFACTURING UNIT

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ABSTRACT

This paper is based on a survey conducted on top management's awareness and understanding of benchmarking in Indian automotive manufacturing companies. The main objective of this paper is to provide empirical evidence on top management's awareness and understanding of the benchmarking technique and its role towards business survival and competitiveness. To achieve this objective, the authors developed a questionnaire comprising of fifthteen questions, checked for reliability and validity by experts and practitioners. The survey results and findings revealed that almost 17% are in the very good category, about 55% of the respondents companies are still in the moderate category, nearly 22% are in the low category and 6% have very little understanding and knowledge as regards to benchmarking. In summary, the survey analysis showed large majority of the Indian companies involves in the automotive manufacturing sector still experiencing lack of knowledge as regards to the benchmarking concept and its role towards enhancing their business process effectiveness and competitiveness. The paper culminates with discussions and conclusions, focusing on recommending the steps that should be taken by the Indian government through its agencies such India Productivity Corporation (IPC) and Small & Medium Industry Development Corporation (SMIDEC) in encouraging more companies to use the benchmarking A Survey on Benchmarking Understanding and Knowledge Among Indian Automotive Components Manufacturing SMEs 386 technique in their pursuit to survive and be more competitive in the local, regional and global market.

KEYWORDS: Benchmarking, Competitiveness, Survey, Performance, Survival, Customer Satisfaction

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 inter-diffusion 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, 2002). 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 (1997) 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, 1997). However, the formalization of benchmarking as an instrument of managerial practice, and its widespread use within change initiatives such as business process redesign, TQM, reengineering is relatively recent and was developed by Xerox Corporation in the late 1970s (Fong et al., 2001; Drew, 1997). Xerox Corporation was the market leader for the sale and rental of photocopy machines until 1975. However, by 1980, Xerox had lost virtually 50% of its market share and competition in the business was intense (Deros, 2004; Amir, 1994). The main competitors were Cannon and Ricoh, Japanese companies which match Xerox's quality, reliability and service but better on price (Amir, 1994). If Xerox was to remain as market leader, they need to change their business approach and renew their customers' focus. In an attempt to gain back its market share, Xerox compared its operation and quality standards to its competitors (Ramabadron et al., 1997; Elmuti et al., 1997). Using Fuji-Xerox, which won the 1980 Deming Prize, as the role model, they realized that there was a need to change the corporation's culture and management style (Amir, 1994). Xerox began its journey of benchmarking when it sent a project team to learn from its Japanese joint-venture partner, Fuji-Xerox. Xerox was able to secure significant improvements in quality, costs and time to market by learning best practices from the Japanese and Xerox success in benchmarking is widely publicized (Ramabadron et al., 1997; Ahmed and Rafiq, 1998). Elmuti (1998) and Brah et al. (2000) reported that more than 70% of Fortune 500 companies in the USA and 78% of The Times Top 1,000 companies in the UK claimed to be conducting benchmarking on a regular basis. Pryor and Katz (1993) attributed the dramatic improvement in the performance of Xerox, Ford and Motorola due to benchmarking. It is expected that an efficient company will be able to withstand market competition, less sensitive to unfavourable changes in the environment and more likely to use indicators to link the best of its short, medium and long-term goals (Tölösi and Lajtha, 2000) within automotive industry, Bennet et al. (2006) believed that management of future complex sub-assemblies and full systems needs to be managed carefully between suppliers and suppliercustomer to guarantee project success. From his study, more than 80 per cent of Toyota's achievement of competitive advantage over its UK rivals is based on the effective use of its supplier network. The key to Toyota's success come from its strategic approach known as Toyota Production System (TPS), which had been shared with their direct suppliers. Due to its effectiveness, the TPS has been successfully applied by most of the automotive company all over the world. Even though this supplier networks are fairly new within the western setting, the TPS provide the significant benefits to the productivity of the companies.

BENCHMARKING DEFINITION

Benchmarking is recognised as an essential tool for continuous improvement of quality. There are numerous definitions that have been proposed for benchmarking by different authors (Sarkis, 2001). Modern

benchmarking practice is aimed at importing and implementing best practices across the organization. There are many definitions for the term "benchmarking"; some of the commonly used are describes from now onwards. Key themes include measurement, comparison, and identification of best practices, implementation and improvement (Anand and Kodali, 2008). Kyro (2003) held the view that, a benchmarking is classically seen as a tool to improve organisation's performance and competiveness in business environment. Benchmarking is a multifaceted technique that can be utilized to identify operational and strategic gaps, and to search for best strategies that would eliminate such gaps. In this context, benchmarking has an internal dimension and external dimensions in an attempt to examine and identify the best practices in their environment (Yasin, 2002). Benchmarking is the process of identifying superior performance or practices of other organizations and internalising such knowledge for competitive advantage (Hyatt, 2001; Ramabadron et al., 1997). It is a process for measuring one's performance against best-in-class companies, then using the analysis to meet and surpass the best-in-class or world-class companies (Voss et al., 1997). It is a continuous, systematic process for evaluating the products, services and work processes of organizations recognized as sector, industry or world class leaders for the purposes of organizational improvement (Parker and Kovacs, 2001; Sarkis, 2001; Tölösi and Lajtha, 2000; Cooper et al., 1996). It involves a continuous systematic process to learn and incorporate product and process innovations that have been proven successful (Brah et al., 2000, The Benchmarking Portfolio, 1995, Voss et al., 1994). A continuous searches for, and application of, significantly better practices that lead to superior competitive performance (Ahmed and Rafiq, 1998). However, as evidenced in the literature, most authors have provided almost similar views on benchmarking definitions and they can be characterised into three major areas such as measurement via comparison, continuous improvement and systematic process in carrying out benchmarking activity (MPC, 2001; APQC, 2001; Hyatt, 2001; Parker and Kovacs, 2001; Sarkis, 2001; Brah et al., 2000; Tölösi and Lajtha, 2000; Hodgetts et al., 1999; Ramabadron et al., 1997; Cooper et al., 1996; The Benchmarking Portfolio, 1995; Voss et al., 1994). Thus, it is believed that these three areas encompass pertinent aspects of any benchmarking process.

WHY BENCHMARKING IS NEEDED

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

In other words, benchmarking helps organizations to focus on the external environment and to improve process efficiency. Camp (1998) believed benchmarking is a positive, practical process to change operations in a structured fashion to achieve superior performance. Meanwhile, Elmuti et al. (1997) have the opinion that benchmarking could provide a company with a performance assessment tool, an enhanced performance tool, a growth potential tool and a job satisfaction tool. Vermeulen (2003) believed that benchmarking should be integrated into the fundamental processes throughout an organization and conducted as an ongoing continuous process. Further to this, Henderson-Smart et al. (2006) had used benchmarking to develop a method for learning and teaching in the field of academics, while Graham (2005) had reviewed the application of benchmarking in airports and proposed that these techniques are used and become well establish within the airport sector. Meanwhile, a survey in France conducted by Chambre de Commerce et d'Industries estimates that 50 percent of the 1000 companies use benchmarking regularly, and 80 percent of them consider it as an effective approach of transform (Maire et al., 2005). In order to establish an information and reference center for benchmarking training and expertise for industries in India, the Indian Benchmarking Service (IBS) had been set up by the India Productivity Corporation (MPC) in 1997. The main aim of IBS is to provide information on benchmarks and best practices through partnerships and networking. Besides, IBS promotes benchmarking as a means of introducing substantive changes in the quest for excellence, facilitates information-sharing among companies, and provides training in benchmarking (Lee et al. 2006).

RESEARCH METHODOLOGY

Survey Objectives

The survey methodology was used to obtain general overall information on benchmarking awareness, understanding and adoption among Indian SMEs involved in the automotive component manufacturing sector.

Survey Instrument Development

A prerequisite in designing a good questionnaire is to decide what to measure. This step seems simple and self-evident but if overlooked may result in producing low quality questionnaires (Fowler, 1984). A good question can produce reliable and valid answers for the variable being measured. 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 benchmarking 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 benchmarking were included. The final form of the postal survey questionnaire consisted of two (2) main sections, which comprise of general information and general benchmarking 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 benchmarking knowledge, TQM activities and benchmarking initiatives implemented. Meanwhile, the general benchmarking opinion section forms the main part of the questionnaire. It consists of 15 general statements on

benchmarking, derived mainly from the literature, and believed to cover all major elements of the technique. In this section, respondents were asked to rate their level of agreement to certain statements on a five point Likert scale from (0) 'don't know/unsure', (1) 'strongly disagree', (2) 'disagree', (3) 'neutral', (4) 'agree' and (5) 'strongly agree'. The objective of this section is to indicate the respondents' level of awareness, understanding and knowledge of the major aspects of benchmarking.

Expert Validation and Pilot Study of Survey Instrument

The pilot study was performed by sending-out the final draft questionnaire to benchmarking experts and benchmarking practitioners (such as executive directors, managing directors, manufacturing managers, operation managers, production managers and quality managers), who had the relevant expertise and experience in benchmarking implementation for validation, comments and suggestions on the survey questions clarity and appropriateness. It is inline 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). A total of 30 questionnaires were sent-out and the response rate was almost 37%. 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 benchmarking experts gave a positive remark where they commented that the study is an interesting project worth researching.

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 benchmarking 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 benchmarking 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 vendor's 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.

SURVEY RESULTS AND FINDINGS

Profile of the Respondents

The majority (i.e. 71%) of the respondents companies, which involved in the automotive components manufacturing sector, were completely owned by Indian (see Figure 1). Meanwhile, the remainders 29% of the companies were on joint venture basis between local entrepreneurs and foreigners.

Figure 1: Percentage of type of company ownership

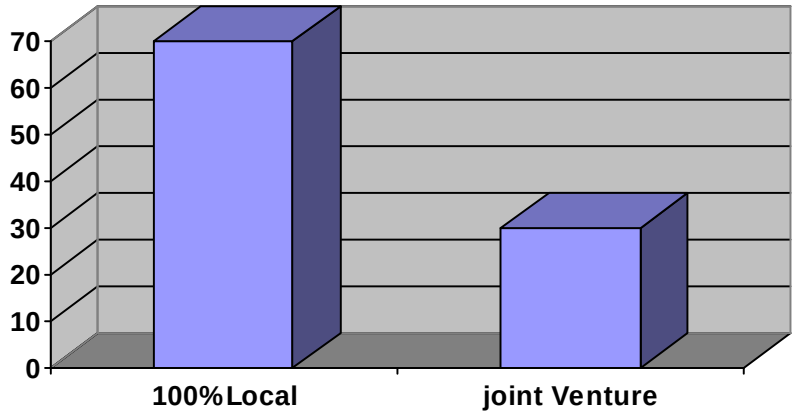


Table 1 shows the distribution of products types manufactured by the respondents' companies.It can be seen that 43.9% are producing metal parts, 21.2% plastic parts, 16.7% electronic parts, 15.2% electrical parts, 13.6% rubber parts, and 24.2% other parts (i.e. comprise of carpet, lamps, glass, oil, paint, etc.) for the automotive 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	21.20%
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%

Note: The total exceeds 65 since some companies produce more than one type of product.

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	Percent
ISO 9000:2000	50	77%
QS 9000	20	30.80%
Others	9	13.80%
None	12	18.50%

Note: The total exceeds 65 since some companies have more than one quality system certification.

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

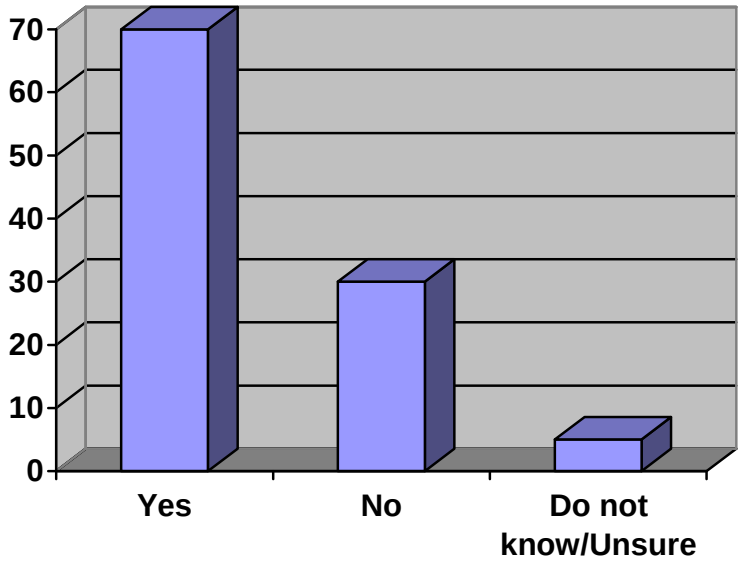


Figure 2: Prior Knowledge on Benchmarking

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

Table 3: Types of Benchmarking Initiatives Implemented – Overall

Sr No.	**Benchmarking Initiatives Implemented**	**Number of companies**	**Percent**
1	Knowing and understanding own process	39	59.10%
2	Establishing benchmarking measures	22	33.30%
3	Education and training in benchmarking	18	27.30%
4	Identifying benchmarking partner	18	27.30%
5	Employee involvement in benchmarking	14	21.20%
6	Developing benchmarking strategies	14	21.20%
7	Setting-up a benchmarking unit	13	19.70%

Note: The total exceeds 65 since some companies have implemented more than one types of benchmarking initiatives.

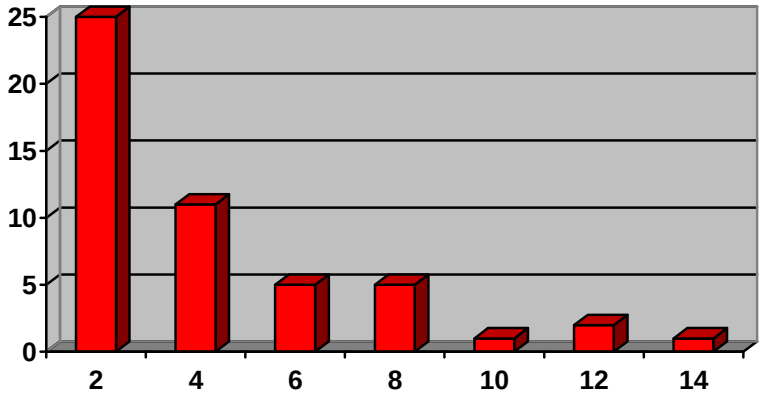
It is quite surprising to know that only about 20% of the respondents companies had set-up a formal benchmarking unit in their respective companies. This may probably due to human resource constraints faced by majority of the companies surveyed. However, the authors believe, it is very important to set-up a benchmarking unit before embarking on benchmarking initiatives. A benchmarking unit could help top management in making policy decisions, identify and select the key business performance measures to be benchmarked. In addition to that, it could assists top management to decides on the benchmarking technique to be adopted and to review all activities in the benchmarking process. Members of this unit should comprise of representatives from managerial, supervisory and operator level. On average, the number of years during which the respondent companies had implemented benchmarking initiatives was 3.7 (see Figure 3). The survey results show that benchmarking is still considered a new tool for performance improvement in the Indian automotive component manufacturing companies. This due to the fact that majority (75%) of the companies have five years or less experience and are still in the early stages of benchmarking implementation and yet to be widely used.

Std. Dev = 3.18

Mean = 3.7

N = 49.00

Figure 3: Number of Years Involvement in Benchmarking



LEVEL OF UNDERSTANDING AND KNOWLEDGE ON BENCHMARKING

Section 2 of the survey questionnaire consisted of 15 general statements, ranging from the philosophy of benchmarking through to its role in improving customer satisfaction, reducing manufacturing costs, improving business process efficiency and hence business competitiveness. These statements were used in investigating the

level of understanding and knowledge of the respondents concerning benchmarking in general. In this section, the respondents were asked to indicate their level of agreement with each of the statement by using a Likert scale of 0 to 5.

Table 4 shows the mean score for each statement

Ranking	Statement	Mean
1.	World-class organization practices benchmarking and continuous improvement	4.55
2.	Customer satisfaction is measured based on product/service conformance, reliability, durability, serviceability and responsiveness	4.43
3.	Management must provide adequate resources in all aspect of benchmarking initiatives	4.29
4.	Benchmarking is a structured proactive process of changing operations used at operational, strategic and tactical levels to achieve and maintain superior business performance	4.28
5.	Organizations use benchmarking information to revise performance goals, develop action plans for improvement in key processes and products/services	4.20
6.	Management leadership, commitment, support and involvement is important to the success of benchmarking initiatives	4.06
7.	Key performance measures for benchmarking should be selected based on their effectiveness in measuring customer satisfaction	4.00
8.	Benchmarking is a means to demonstrate both the needs to improve business performance (such as product/service quality, process efficiency) and how it can be accomplished	3.97
9.	Objectives of the benchmarking planning step are to identify customer needs, related critical processes to fulfill these needs, benchmarking partners, the link between benchmarking and organizational objectives	3.95
10.	Teamwork and participation are important in achieving the benchmarking objectives	3.94
11.	Stiff competition and survival in the market place triggered competing companies to embark on benchmarking initiatives	3.92
12.	Education and training are really necessary when adopting benchmarking	3.88
13.	Financial and non-financial measures are given the same priority, monitored on regular basis to track achieved and anticipated results of benchmarking activities	3.82
14.	Systematic benchmarking planning in data collection, analysis, checking activities to achieve maximum benefits and cause minimum work disruption	3.77
15.	Conducive work environment and initiatives such as continuous improvement, suggestion schemes are necessarily to motivate employees to participate in benchmarking activities	3.46

Referring to Table 4, majority of the respondents seem to agree and clearly understand that:

• World-class organization practices benchmarking and continuous improvement (4.55)

• Customer satisfaction is measured based on product and service conformance, reliability, durability, serviceability and responsiveness (4.43)

• Management must provide adequate resources in all aspect of benchmarking initiatives (4.29)

• Benchmarking is a structured proactive process of changing operations used at operational, strategic and tactical levels to achieve and maintain superior business performance (4.28)

• Organizations use benchmarking information to revise performance goals, develop action plans for improvement in key processes and products/services (4.20)

In the meantime, there is some doubt as to their level of understanding with regards to conducive work environment and initiatives such as continuous improvement, suggestion schemes that could provide motivation for employees to participate in benchmarking activities (3.46), since its mean score is low compared to the others. This statement is very important because change initiatives (such as benchmarking and total quality management) can only be implemented successfully if continuous improvement and employee involvement is being widely practiced and the work environment is favourable for such improvement effort. Without this, the efforts to continuously improve process efficiency and business performance might face many problems and obstacles, which can eventually lead to failure.

In order to find out the level of benchmarking understanding and knowledge, these 15 statements were used as a tool for allocating a 'score' to each company. In this context, a respondent company, which achieved a higher 'score', is interpreted as having better understanding and knowledge on benchmarking compared to the others.

The overall average score for the General Benchmarking Opinion is about 60 points and approximately 56% of the respondents companies scored above this value (see Table 5). In this study, the authors had classified the respondents into four distinct groups according to the score they obtained. In the authors' opinion, those respondents companies scoring 50 points or less were believed to have very little understanding and knowledge of the benchmarking technique (Level IV). Those respondents companies scoring between 51 and 56 points inclusive were classified as companies with low understanding and knowledge of benchmarking (Level III). Meanwhile, respondents companies, which scored between 57 and 66 points inclusive were considered as having moderate understanding (Level II) and those with a score of 67 or more points were considered as companies, which have very good understanding and knowledge of benchmarking (Level I).

Table 5: Score' of Benchmarking Understanding and Knowledge

Score (out of possible 75 points)	Benchmarking understanding and	Number of companies	Percent (%)	Cumulative Percent (%)

	knowledge			
41 - 50	Level IV	4	6	6
51 – 56	Level III	14	21.7	27.7
57 – 60	Level II	11	16.9	44.6
61 - 66	Level II	25	38.5	83.1
67 - 75	Level I	11	16.9	100
		65	**100**	

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 benchmarking initiatives for full implementation. The survey results and findings revealed that about 55% of the respondents companies are still in the moderate category (Level II), almost 17% are in the very good category (Level I), nearly 22% are in the low category (Level III) and 6% have very little understanding and knowledge as regards to benchmarking (see Table 5). 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 benchmarking concept and its role towards enhancing their business process effectiveness and competitiveness. It is therefore crucial to improve their knowledge and awareness of the benchmarking's 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 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 benchmarking technique by conducting seminars, workshops, road-shows, education and training, publishing articles in the local mass media related to the benchmarking concept. The survey methodology used in this study has several limitations. The reliability and validity analysis were conducted based on 65 companies only, which is considered to be quite small sample size. Therefore, the results of this study must be treated with caution. The results presented in this paper is a part of an on-going research on benchmarking implementation in Indian automotive companies.

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