

Determinants of Sustainable Continuous Improvement (Kaizen) Implementation in Malaysian Automotive Part Supplier SMEs

Mohd Ghazali bin Maarof and Shahryar Sorooshian

Faculty of Industrial Management
Universiti Malaysia Pahang
26030, Kuantan, Pahang Darul Makmur
Malaysia

mohdghazali@ump.edu.my, sorooshian@ump.edu.my

Suhaila binti Abdul Hamid

Faculty of Economics and Muamalat
Universiti Sains Islam Malaysia
71800 Nilai, Negeri Sembilan
Malaysia

suhaila@usim.edu.my

Abstract

Globalization has caused many organizations to adapt themselves to the ever-changing business environment in order to sustain in this competitive market condition. Malaysian automotive part suppliers SMEs are also affected by the globalization. To remain competitive in this challenging business environments, the SMEs need to ensure continuous improvement are being implemented as part of their business strategy. This paper presents findings from a larger study on Kaizen implementation among automotive part supplier SMEs in Malaysia. Nine semi-structured interviews were conducted with four automotive part supplier SMEs located in Selangor and Pahang. The data during the interview were recorded, transcribed and coded before being divided according to relevant themes. Top management commitment, training, kaizen champion, supportive organization culture, communication, recognition and reward and employee empowerment are found to be among the determinants for successful continuous improvement. The findings from this study are useful to help companies to embark or sustain their kaizen activities. Furthermore, it is useful information to respective government agencies to develop policies that can help Malaysian automotive industry especially the SMEs to sustain their business.

Keywords

Kaizen, Continuous Improvement, SME, Determinants, Interview

1. Introduction

The advancement of globalization, increased competition and diminishing resources have forced many manufacturing companies to improve their processes and eliminate waste in order to sustain in this competitive market (Duran et al, 2015). As a result of globalization, many organizations need to adapt themselves to the ever-changing business environment in order to sustain in this challenging market. However, globalization has also brought along many new business opportunities as well as challenges to the business community. Among those opportunities is the access to new and freer market between countries, thus, creating wider business opportunity. On the other hand, globalization also introduces new challenges such as the need to develop new technologies, products and services. Industries are forced to apply lean principles as a way to improve their processing efficiencies to produce more with less resources (Radnor et al, 2008). By applying the lean principles, they can increase their productivity by eliminating all the existing non-value added activities (waste) which can directly lead to higher

financial growth (Moktadir et al, 2017). Eliminating non-value added activities is the fundamental strategy for organization to achieve operational excellence (Biseas et al, 2016).

Lean manufacturing or also known as “lean” is a systematic method of eliminating waste (“Muda”) that occurred in a manufacturing system. In lean, waste is defined as anything that does not create value to the eyes of the customer. This management philosophy is derived from the Toyota Production System (TPS) which focuses on eliminating seven types of wastes. The main objective is to provide good quality product at a lower services cost by continually improve the processes through elimination of waste and increase customer value (Ohno, 1988; Fujimoto, 1989; Womack et al., 1990, 2003; Hines et al., 2004; Holweg, 2007). To eliminate those waste, firms need to apply a range of approaches known as the “lean tools”. One of the most commonly used lean tool is kaizen or continuous improvement. Kaizen focuses on the elimination of seven types of waste: transportation, inventory, motion, waiting, over-production, over-processing and defects (Wormak and Jones, 2003). Kaizen calls for small, low cost and gradual improvement by all member in the organization empowered to eliminate waste in the organization.

Kaizen derives from a two Japanese words which means change (“Kai”) and for the better (“zen”) (Palmer, 2001). The Kaizen philosophy was originally based on a Japanese management concept where employees from various level in an organization engaged proactively to continuously improve specific areas in the company. This continuous improvement activity will bring gradual changes, cost saving solution and elimination of waste. Manufacturing organization always requires their workers to perform uninspiring and boring tasks in a highly repetitive condition which may cause demoralized and fatigued workforce (Shikdar et al, 2003). Through kaizen activities it can improve employees job satisfaction by amending the tasks they normally perform which may lead to a highly increased productivity for the company (Al-Saleh, 2011). A study done by Von Thiele Schwarz et.al.(2017) has found that kaizen enables employees to interact and engage in psychosocial risk management which could lead to improve their well-being in term of job attitude and mental health.

Even though some past studies (Atkinson, 1994; Dabhilkar et al, 2004; Al-Khawaldeh and Sloan 2007; Marin-Garcia et al., 2008) have identified various critical factors that influence the outcomes of Kaizen activities, there are some organization still struggling to sustain their kaizen activities in the long-term. Pedro (2011), Suárez et al. (2011) and Garcia (2013) argued that many organizations are still struggling to achieve the expected result from their kaizen activities in their company. Therefore, this paper is going to determine the main contributing factors to the success of kaizen implementation among automotive SMEs companies in Malaysia. Automotive industry was chosen in this study because it can be regarded as the “industry of industry” which has the potential to drive industrialization plan ahead due to its linkages and spill-over effect on other manufacturing industries (Dicken, 2007). SMEs was chosen due to its impact on Malaysian economy where 98.5% of total business establishment in Malaysia is formed by SMEs and they have created 65.3% employment opportunities as well as 36.6% of Malaysian gross domestic product (SME Annual Report, 2016). The determining factors were addressed through a list of questions being asked to all the participants from the SMEs companies. Therefore, this study is going to answer the following question:

RO1: What are the factors that contribute to the Kaizen success in the automotive part supplier’s SMEs companies?

2. Research Background

2.1 Kaizen Concept

Kaizen was first introduce at the Toyota manufacturing plant in Japan during the early 1950s and has become one of the main reason for Japan’s business success. Kaizen is a philosophy and a workplace methodology aiming to take control and improve workplace in term of costs, quality, flexibility (Bessant et al, 1994) and also productivity (Choi et al, 1997). Kaizen does not relay on sudden and high cost solution but improvements are made based on gradual improvements that add up to a better, higher and more efficient working condition.

Kaizen focuses on three major improvement areas: Muda (waste), Mura (discrepancy) and Muri (strain) (Imai, 1986). To implement Kaizen, a few tools, also known as kaizen umbrella, can be adopted such as Total Productive Maintenance (TPM), Total Quality Control (TQC), Zero Defect (ZD), Quality Improvement, Automation, Kanban, Just-in-time (JIT), Quality Control Circle (QCC) and the suggestion system (Imai, 1986).

Kaizen is a strategy that involve the participation of all employees at various levels to proactively work together on improving specific area within the company (Imai, 1986). To implement Kaizen, employees will be given empowerment at some levels to identify and solve problems related to their workplace issues. Through the empowerment given by the top management, employees will feel that they are partly involved in the decision-making and improvement process.

2.2 Kaizen implementation in the industry

The advancement of information technology has created a new level of competition among the industry players. Companies, as a result of the information technology advancement, need to improve their product quality, cost and delivery (QCD) in order to sustain in this competitive business environment (Bane, 2002; Gulbro et al, 2000). To achieve this objective, changes are needed in their business processes. There are several ways used by companies in conducting kaizen activities such as through individual improvement suggestion scheme or through Gemba Kaizen (kaizen events) activities.

Gemba in Japanese means 'real place'. Thus, in gemba kaizen, the team will go to the area where action is needed and look for possible action required. The team, led by a facilitator together with a cross-functional team member, will conduct a specific one-off and short duration improvement projects. To implement Kaizen, the team will adopt the Plan-Do-Check-Action (PDCA) cycle to solve and improve the identified problem (Imai, 1986). During the planning stage, employees will identify areas that need improvement. Various Kaizen tools can be used to develop a clearer understanding of the current state such as the Five Why's technique or Value Stream Mapping (VSM) technique. Once all the necessary data has been gathered and analyzed, a realistic goal will be set. After a few sessions of brainstorming, the team will identify the options or ideas to improve the current problem. The second stage, the do stage, the team will select the best options and implement the option that they have chosen in the production floor. The third stage in the Plan-Do-Check-Action (PDCA) cycle is to conduct a follow up on the Kaizen activities to see if the improvement gives any positive or negative effect towards the problem. The team will record their achievement on the scorecard and present them to the top management and others so that it will be assessable to all employees. Finally, the team will review all of the achievement and see if action can be standardized to other similar process within the company.

2.3 Contributing Factors for Kaizen

Based on past literature, there are many factors that have contributed to the success of kaizen implementation. Among the factors were the commitment and motivation of the staff involved (Kaye et al, 1999; Rapp, 2002) and senior management commitment (Upton, 1996; Rapp, 2002; Garcia et al, 2013). In addition, supportive Kaizen culture in the organization together with strong leadership that provides clear policy and goals (Dale et al, 1997; Jorgensen et al, 2004; Bateman, 2005; Suarez et al, 2011) make it easy for the team to run the kaizen activities effectively. Easy deployment and allocation of resources were also found to be another factors for kaizen success (Melnyk, 1998; Rapp 2002) especially when it involved a cross-functional effort. The presence of a caliber kaizen champion or facilitator (Upton, 1996; Rapp, 2002; Sutari, 2015; Vento, 2016) helps to assist team members to overcome barriers in conducting kaizen. In addition, training and education are also another crucial factors that contribute to kaizen success (Garcia, 2013) as they develop the members' ability to conduct and collaborate with other team members more effectively.

3. Methodology

This study used a qualitative research design to explore the experience of the employees involved in the kaizen implementation in the Malaysian automotive SMEs companies located in Selangor and Pahang. In qualitative research approach, data in the form of words will be used to study the phenomena of interest and draws on multiple methods of inquiry (Rossman and Rallis, 2003). In addition, qualitative research method also allows researchers to retain the holistic and meaningful characteristics of the real-life events (Yin, 2009). Thus, allowing researchers to obtain a deep understanding into the issues. Semi-structured interviews were used to collect data for this study to allow the exploration of opinions of respondents to new, complex and sensitive issues. In addition, semi-structured interview also provides different vocabularies in terms of the answers given by respondents making it more reliable than structured interview (Barriball & While, 1994).

The questions used in this interview were strictly designed based on four main criteria. First, only open ended question will be asked. Second, no leading type of questions to avoid biasness. Third, the questions are designed to be short and specific to maintain conciseness. Lastly, the language used is understood by the participants (Newton, 2010). Participations in this study were open to all automotive part suppliers SMEs that have implemented kaizen for at least one year. The interview sessions were audio-recorded and transcribed in order to generate a written interview report. The questions asked were formed based on the research questions, categorized and coded using thematic analysis as proposed by Braun and Clarke (2006). To increase the reliability of the interview findings, the researchers transcribed the recording repeatedly, checked the transcript, and compared the transcript against the recording to ensure there was no mistake. To ensure accuracy of the transcript and themes, the investigator triangulation process was performed which required a cross-check among members on the transcription and themes. This process may increase the validity of the interview findings.

For the purpose of this study nine participants from the automotive part suppliers SMEs located in Selangor and Pahang have been interviewed as presented in Table 1. All of the SMEs were medium size companies with either the 2nd or 3rd tiers part supplier's companies. Each interview took an average of one hour to complete and were conducted between 2016 and 2017. For the purpose of confidentiality and anonymity, the participants have been identified as "Participant no.1 to 9".

Table 1. Profile of interview participants

PARTICIPANT NO	COMPANY	POSITION IN THE COMPANY	WORKING EXPERIENCE
1	A	Senior Operation Manager	23 years
2	B	Executive	13 years
3	C	Head of Manufacturing Dept.	25 years
4	C	Head of Quality Management Dept.	8 years
5	C	Senior Executive Quality Management Dept.	3 years
6	D	Senior Manufacturing & Quality Engineer	22 years
7	D	Industrial Engineer	2 years
8	D	Lean Engineer	2 years
9	D	Assistant Production Manager	23 years

The components and parts suppliers were chosen because the competitiveness of the Malaysian automotive industry is very much depending on the auto components and parts sectors ability to control the quality, efficiency and delivery capabilities.

4. Results and discussion

This section identifies the determining factors that enable companies to successfully implement kaizen practices in their organization. Many of the distinctive factors identified here can also have significant influence on any organization that embark on the continuous improvement implementation. It is important to note that describing each determining factors among automotive SMEs can also help other firms to understand how these factors can influence their adoption of kaizen activities. Figure 1 presents an overview of the analysis that shows the effect of the contributing factors on the continuous improvement practices in the related SMEs. For the purpose of confidentiality, the companies involved will only be identified as company A, B, C and D.

Contributing factors	Company A	Company B	Company C	Company D
Top Management commitment	X	X	X	X
Training	X	X	X	X
Kaizen Champion	X	X	X	X
Recognition and reward		X	X	X
Employees empowerment	X	X		X
Supportive Organization culture	X	X		
Communication		X		X

Figure 1. Determining factors in implementing continuous improvement

The determining factors in figure 1 were simplified using the bar graph to show the frequency of responses made by the participants. Figure 2 presents the bar graph of the contributing factors in implementing continuous improvement among the automotive part suppliers SMEs.

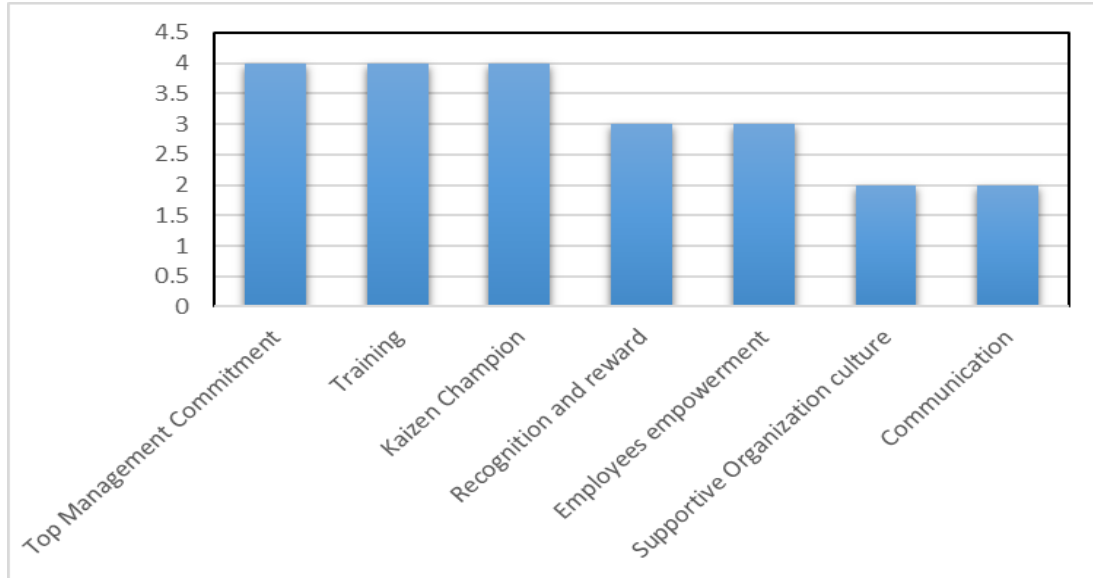


Figure 2. Contributing Factors Bar Graph

All four SMEs companies involved in this study have successfully implemented their kaizen journey for more than 5 years. However, there are some significant differences on their approach towards the implementation. Table 2 presents a summary of the key factors or decisions during the continuous improvement implementation in the four automotive SMEs.

Table 2. Key factors or decisions during continuous improvement implementation.

Company	Key factors or decision
Company A	<ul style="list-style-type: none"> • Existence of a Kaizen Champion • Adequate training • Employees empowered to run kaizen activities • Good working culture, discipline and team-work • Top Management commitment to employ an expert
Company B	<ul style="list-style-type: none"> • Appointment of a fulltime kaizen champion to plan, promote, monitor and coordinate kaizen implementation • Company policy that enforces active kaizen participation • Kaizen training to all levels • Availability of reward system • Register all kaizen team and monitor by kaizen champion • Link kaizen activities to personal key performance indicator (KPI) • Empower employee to run kaizen • Establish a two-way communication channel • Good working culture towards kaizen • Utilize visual management to promote communication
Company C	<ul style="list-style-type: none"> • Provide reward to promote kaizen • Appoint a kaizen champion • Fulfil customer requirement

	<ul style="list-style-type: none"> • Required kaizen involvement as a requirement for “best worker” award • Establish a training centre to teach theory and practical of kaizen • Kaizen involvement link to individual key performance indicator (KPI) • Have a specific target on kaizen involvement • Appreciation reward for achieving kaizen target • Each department has its own KPI target set • Conduct benchmarking • Implement job rotation and multitasking to avoid staff into “comfort zone”
Company D	<ul style="list-style-type: none"> • Appoint a kaizen champion to promote and monitor kaizen • Send staff for training to become kaizen leaders • Employees empowerment to give suggestion on the problem they faced • Give cash reward as incentive • Establish good communication by going around and meet people • Create sense of belongings • Ownership feeling • Top management involvement in kaizen activities • Strong team work

Describing each determining factors can help us to understand how the effect of those contributing factors on the implementation of continuous improvement in the automotive SMEs. Discussions on these matter will be continued as below.

4-1 Top Management commitment

When the participants were asked about the commitment given by their top management, majority of them agreed that top management has given a good commitment by actively involved in most of the kaizen activities. The Management involvement is needed to instill kaizen culture in the organization. One remark given by one of the participants commented,

“... the Director will monitor closely all the project related to the continuous improvement. When he himself does the monitoring, it reflects how serious the management are in the implementation of such activities”.

Participant no.6

Developing a sustainable continuous improvement requires a strong commitment from the management team. This includes providing consistent financial support, committed to the required resources, align kaizen activities with strategic objectives, establish system and policies, provide motivation support as well as participating directly in the activities. In addition, to make kaizen activities effective, employee need to be trained and this requires some financial investment to provide training to the workers, hiring experts or consultants, providing necessary materials to run the improvement project and reward the team. The following were mentioned by the participants:

“The CEO of the company is very serious with the kaizen activities. They even hired a Japanese consultant who is an expert in the field to assist us with the activities.”

Participant no. 1

“The company’s management policy clearly stated that continuous improvement activities must be carried out by all employees to eliminate waste.”

Participant no.2

“To encourage the involvements of the employees in kaizen activities, the management has included the employee’s participation in the individual key performance indicator (KPI).”

Participant no.4

“...the most important thing is we can see the high commitment given by our top management in providing knowledge to the employees through training”

Participant no.7

4-2 Training

Training plays an important role in the success of kaizen implementation at all four companies that were studied. There are many approaches which the four companies used when it comes to training. In company C for instance, the new employees will be required to attend the induction training in which they will be exposed to kaizen. To facilitate the training process, an internal training center has been established to cater the training needs, Employees will be given some theoretical explanation followed by some practical exercise to help them understand the kaizen concepts. Later, the staffs will join the Kaizen activities which will be conducted in group. To those who are still not familiar with the kaizen concept, they will be guided by their team members who is more senior to be involved in the improvement project.

At company D, they will identify a few workers that will be sent for training to become the Master Lean Practitioner (MLP). These MLP will learn some of the lean tools such as 5S, Standardized work, Value Stream Mapping, Quick change Over or Visual Management. For each of the tools there will be at least one champion and they will come back and help the company to lead the improvement team at their respective section or department. Furthermore, the employees will be given continuous training annually.

At company B, participant no.2 informed that training on kaizen will be provided to all level of employees which focuses on matters related to the production processes. Thus all employees are required to join the activities. One of the participant reported that

“Training will be provided. We even provide refreshment training annually. During the refreshment training, the employees will be explained about the improvements that have been done in the past, the importance of them as well as how they were done.”

Participant no.2

Initially, Company A has received training on kaizen from their Korean business partner. The following was mentioned in the interview:

“Every quarterly our business partner from Korea will come and train us on what need to be done. They will provide training as well as direction on how to run the kaizen activities. Initially there are some employees that were sent to Korea to get them expose and it continues for about a year. Later they will ask us to run the activities by ourselves and they will just monitor the progress... Now kaizen training is done by the Malaysian Automotive Institute (MAI). The training program took for about six to seven month with MAI and they came here every week to give training as well as follow up and conduct benchmarking. As a result, the company manages to achieve the Top 5 highest companies in term of achievement and commitment.”

Participant no.1

4-3 Kaizen Champion

All four companies involved in this research have appointed a “kaizen champion” to fostering continuous improvement activities among their workers. A “Kaizen champion” is characterized as a charismatic leader that exert full leadership potential to implement continuous improvement process by all the workers (Dale et al, 1997; Kaye et al, 1999). Based on the interviews, the Kaizen champion defined their role as an important person to act as the coordinator, facilitator, mediator as well as motivator to provide support when required. Kaizen champion also acts as the communication channel between the company’s management team and the workers in the kaizen implementation by compiling the progress report of the projects and report directly to the top managements. Some of the comments given by the participants are as below.

“We have a kaizen champion that act as management representative in the kaizen activities. He will coordinate the kaizen activities in the production line and other department as well.”

Participant no.1

“My role is to initiate the project and follow up on the progress, achievement made and the result. Thus, I need to be involved during the project planning and the implementation stage.”

Participant no.6

“If the kaizen project involved some big changes such as high cost, modification of the production line arrangement or modification of the product design, then, kaizen champion will bring this matter to the top management to get their final approval before it can proceed.”

Participant no 3

4-4 Supportive Organization culture

As described by the participants, organization culture played an important role in the project success. A culture that supports for change and improvement couple with good discipline and dedication among its workers will lead to a strong teamwork. In this case, the operators and managers will be eager to look for room for improvement and to contribute ideas to solve the problems. At the same time, resources can be effectively distributed based on requirements since cooperation such as inter functional team are made available.

“Most important contribution comes from good discipline worker, positive organization culture and also strong team-work ... This company is well organized, workers are discipline and management system are strong, This leads to strong commitment from the employees to run the kaizen activities.”

Participant no.1

“Positive working environment plays an important role... To create a good working culture, you can't just come and give direction. You need to know the process and the workers first. Then only you can understand the problems and point out what needs to be improved ... For example, good communication plays an important element in a good working culture. Good discipline and appreciation helps to create motivation.”

Participant no.2

4-5 Communication

The existence of a good communication system within the company is another enabling factor in the continuous improvement implementation. Good communication system will facilitate the exchange of knowledge about areas that need improvements and the knowledge between the experts in problem solving. As shared by one participants as follows.

“I like to walk in the production line because by doing this it enables me to listen to the grievance of the floor level employees. I will ask the employees to lodge their complaint in the improvement suggestion form as a way for them to communicate their problem to the management and at the same receive reward for highlighting the problem. As a return the employees will be able to have a good working environment once the problem has been solved.”

Participant no 7

When the teams share their kaizen result with others, the knowledge and experience that they have developed can be deployed beyond their own team. For example, a participant commented as below.

“The presence of an effective visual management to show the kinds of projects that are in progress helps to encourage other people to involve in kaizen activities.”

Participants no.2

4-6 Recognition and Rewards

Recognizing the contribution given by the employees is another important factor towards kaizen success. This finding supported previous studies done by Sim and Roger (2008) and Karlsson and Ahlstrom (1996) which found that there is a significant link between the roles of the rewards system towards the success of the continuous improvement implementation. The following are the information given in supporting the claim that rewards system is important.

“All the workers in this company are encouraged to participate in the kaizen activities. Those who participate actively will be recognize with various reward methods to encourage their participation in kaizen activities.”

Participant no.3

“Members who participate actively in the kaizen activities with excellent outcomes will receive cash rewards. This is to motivate the employees to participate actively since they will receive some rewards from the company.”

Participant no.6

However, to make the rewards system to be effective, it is important to give the rewards immediately after they have submitted their suggestion. One of the participants suggested

“When the employee gets the reward immediately, that will trigger the workers to give more suggestions in the future.”

Participant no.6

Rewards can also be in the form of non-monetary. Having a linkage between continuous improvement activities with individual or departmental key performance indicator (KPI) can also encourage the employees towards kaizen participation.

“The company management has decided to include the employees’ participation in Kaizen activities as part of the individual Key Performance Indicator.”

Participant no 4

Furthermore, employers can also organize an appreciation event to show their appreciation for the contribution given by their employees as a way to motivate other employees to be more active in the future.

4.7 Employee empowerment

Empowerment is the practice of top management to allow non-managerial employees who are specialists on their work area to take some responsibilities and power to make decision related to their jobs and tasks. It is based on mutual trust that are developed between the top management and its workers to become a role player in support of production. Employee empowerment will encourage the production workers or the lower level employee’s participation to offer suggestions for process and quality improvement. The following are the information related to employee empowerment.

“The employees were given their choice to choose the project that they want to work on. By this way the employee will be more willing to contribute their ideas in solving the problem.”

Participant no.1

“In this company the employees will have the right to decide on the team leader and members. All the kaizen teams will be registered so that it will be easy to monitor their progress from time to time...The team decides on the project that they want to do. This is because the people at the production floor are the one who understand the weaknesses that happen at their work place daily.”

Participant no.2

“We received many suggestions from the employees from various level. All the employees can contribute their ideas by filling up the improvement suggestion form that is located at every corner of the production floor.”

Participant no.9

5. Conclusion

This study explored the determining factors that influence the kaizen implementation at four automotive SMEs companies in Malaysia. While many past studies have explored kaizen implementation in large organization, few studies have been conducted on SMEs. Thus, this study can provide some guidance for other SMEs companies particularly those involved in the automotive industry to embark or sustain their kaizen activities. This was done through the identification of the determining factors considered to be critical to the kaizen implementation in the participating automotive SMEs in Malaysia.

The interviews with the managers, kaizen leader and employees provided some insightful details to the factors that influence the success of kaizen implementation. Findings from this study show that there are various factors which contribute to kaizen success such as top management commitment, training, the presence of kaizen champion, recognition and reward, employee’s empowerment, supportive organization culture and communication were found to be the critical factors to determine the success of kaizen implementation in the automotive part suppliers SMEs in Malaysia. However, the limitation of this study with respect to comparability and generalizability cannot be ignored. The research was based on four automotive SMEs in Malaysia and thus the result may not be generalizable to other countries as previous studies indicated that country differences may influence some aspect of kaizen implementation and performance (Ahmad et al, 2003). This research was also based on personal interviews with the participants which means that there are possibilities that the opinion and knowledge gained might be limited or biased. Thus, these limitations might lead to the possibilities of further suggested potential areas for work in the future.

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Biographies

Mohd Ghazali bin Maarof is a lecturer at Faculty of Industrial Management, Universiti Malaysia Pahang. He has over 20 years of Industrial experience with Multinational and GLC companies before joining academic. He earned B.Sc. in Electrical Engineering from University of Missouri-Columbia and Master of Business Administration from Universiti Teknologi MARA. He has published journal and conference papers. He teaches courses in Industrial Project Management, Procurement in Industrial Management, Lean Management, and Cross Module Seminar. His research interests include Operation Management, lean and Supply Chain. He is a member of Industrial Engineers and Operation Management society (IEOM) and Malaysian Institute of Management (MIM).

Shahryar Sorooshian is an Associate Professor at Faculty of Industrial Management, Universiti Malaysia Pahang. He holds a B.Sc. in IE (Industrial Technology), M.Sc.in IE (System Management and Productivity) and PhD in Industrial Engineering. He has extensive research experience and expertise in the area of Management Engineering and Engineering Management. He is member of scientific committee for several journals and conferences.

Suhaila binti Abdul Hamid is a Senior lecturer at Faculty of Economics and Muamalat, Universiti Sains Islam Malaysia. She holds a PhD in Taxation and has some experience in tax work before joining academic. She earned Bachelor in Accounting (Hons.) from Universiti Utara Malaysia, M.Sc. Accounting and Finance from Essex University and PhD in Taxation from University of Canterbury, New Zealand. She is teaching courses in accounting and her research interests are in the areas of accounting, ethics, zakat and waqaf particularly from tax perspectives. She is a member of the Malaysian Institute of Accountant (MIA).