

## CASE STUDY OF ISO/TS16949 APPLICATION IN AUTOMOTIVE INDUSTRY

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### ABSTRACT

In order to be able to compete in the marketplace, many industrial organization starts to equip themselves with quality standard such as ISO9001:2008, QS9000, ISO/TS16949 and ISO14001:2000. All this quality assurance systems are able to increase firms' ability to compete, result in high quality products or services and increase social responsibility to workers. From the literature review, the authors found that the use of ISO/TS16949 standard in automotive industry is still at the early stage. Therefore, this gives an opportunity for the authors to conduct a case study to observe the effectiveness of ISO/TS16949 implementation in automotive supply chain. This study was conducted at three companies' automotive component manufacturers in Malaysia. Having done that, comparison will be made based on similarities and differences between these companies. The result from this study shows that the main reason of applying this ISO/TS16949 standard was based on customer's requirement. The main benefit of ISO/TS16949 implementation is reduction in rejection rate. Besides that, main obstacle in implementing ISO/TS16949 it is difficult to get full cooperation and acceptance from all staff in the organization. Therefore, it is important to understand the ISO/TS16949 implementation procedure in order to be successful in this high competitive globalise world.

*Keywords:* ISO/TS16949, quality standard, automotive industries

### INTRODUCTION

In general quality term usually has two meanings in technical usage. Quality is the features of product and services which able to influence its ability to assure the visible or non visible needs and also a product or service that free from deformity. In the 20<sup>th</sup> century, P.B Crosby, W.E Deming and J.M Juran had redefined the meanings of quality to fulfil the customers' specification, which it is a general trade in producing products or offering services where the countable features are able to satisfy a set of fixed specification that usually are determine as quantitative.

Quality assurance had played an important role for its ability to compete with certain organization or supply chain. All activities such as design, development, manufacturing, assembly, services and documentation are included in quality assurance (Sroufe & Curkovic 2008). Miles and Snow (1978) had produced a typology of

business-level strategies that can be used as a lens through which to view the integration of ISO 9000:2000 within supply chain management quality assurance efforts.

ISO9000:2000 quality standard is a set of interrelated ideas, principles, and rules and could therefore be considered a system. Quality then can be described as a level which fulfil a certain needs and expectation as per says generally in apparent or not by combining the original meaning of quality and ISO9000:2000 policy. Now, quality is more focusing on the awareness steps and process driven. This had change the responsibility of a quality professional to the involvement from all teams' members. Quality have to be an integration of important element from engineering, manufacturing, product coding and sale-buy conduct (Hoyle 2005). According to Abraham et al. (2000), said that ISO9000 is not able to ensure product quality but is more focus on documentation. This means that the ISO9000 is not implemented as organizational initiative because it is difficult to experience changes and eventually will be outdated. Besides that, the main reason the implementation of ISO9000 is not effective is due to its limited to certain product quality development or organizational services only and not involving all operations. Furthermore, this ISO9000 is just focusing on technology, method and system and not on the workers ability, capability and creativity. So eventually, it reduces the ownership and motivation in system due to lots of procedure rather than responsibility.

In 2000, ISO9000 had been rewritten and was used as core for ISO/TS16949 to replace QS9000. ISO/TS 16964 is an ISO technical specification jointly developed by the International Automotive Task Force (IATF) and the ISO that serves as a common automotive quality system requirements catalog. It specifies the quality system requirements for the design, development, production, installation and servicing of automotive-related products (Kartha 2004). At first, IATF had constructed ISO/TS16949:1999. Then, it been verified widely with ISO9001:2000 and had been published in March 2002 as ISO/TS16949:2002. So, ISO/TS16949:2002 is an ISO technical specification that represents a comprehensive quality management system for global automotive industries. The purpose is to achieve product quality, ability, competition and continuous improvement at world level (Kartha 2004). Basically, ISO/TS 16949:2002 is the entire ISO 9001:2000 standard with interpretations of ISO 9001:2000's descriptive language and additional requirements created by the authoring group from the automotive sector (Harral 2003).

The current 2009 revision of the standard took place to incorporate the ISO 9001:2008 revision. The organizational benefits of ISO/TS 16949:2009 are able to meet multiple customer quality requirements with one quality system, ability for increased business, improved utilization of time and materials, improved efficiency and profitability, increased customer satisfaction, quality improvement and timely delivery, improved control of quality and processes, improved performance from suppliers, the responsibilities of personnel clearly defined, provides useful referencethrough documented system and lower reject rates, rework, and warranty costs (Sustaining Edge Solutions Inc. 2008). The ISO/TS16949 had been widely applied in industry nowadays. Philips Lumileds announced that each of its three design, development and manufacturing sites have received ISO/TS16949 certification highlighting the company's commitment to quality management. All three sites, San Jose, Penang, and Singapore, were certified within weeks of each other with, zero non-conformities, representing an approach and commitment to quality that is consistent throughout the company (Philips 2010).

## **METHODOLOGY**

The sampling, procedure and data analysis used in this study is discussed in this section.

### **Sampling and Procedure**

Three automotive component manufacturing companies with ISO/TS16949 implementation experience were selected in this case study. These companies were chosen based on their involvement in automotive industries which comply with the international industrial standard and JIT application. Personal interview method was used as a procedure in this study. To encourage responses and participation during the interview, subjects were told that a copy of the study results will be send to them after the study is completed.

### **Data Collection and Analysis**

The interviews were conducted with ISO manager, quality manager and quality engineer of every automotive company involved in this case study. Collected data were compared on several aspects after the interview was done. Comparisons from similarities and differences were done with respect to the background, activities and company role, quality management system requirement, impact and effectiveness of ISO/TS16949 and suggestion on its implementation. Then, suggestion and improvement in implementing the ISO/TS16949 were given to them.

## **RESULTS AND DISCUSSION**

The three automotives companies involved in this case study were code named Company X, Company Y and Company Z. The data collected from the interviews were summarized and shown in Table 1. Table 1 shows comparisons of the three companies involved in the case study with respect to several factors that comprises of type of automotive component manufacturing, year certified, certification duration, certification factors, implementation, certification impacts and implementation constraints. The similarities and differences in ISO/TS16949 implementation of all factors can be seen clearly from Table 1. The main similarity of all the three companies that are automotive component manufacturers located in Malaysia. All the three companies had obtained ISO/TS16949 certification and producing automotive parts. Even though different components were produced but they were classified as automotive products. All the three companies had implemented ISO/TS16949 at least 3 years and are considered as highly experienced in implementing it. So, the companies were good and efficient enough to be used in the case study for observing the impact of the ISO/TS16949 certification in their companies' performance.

It is apparent that one of the main reasons why a company is applying the ISO/TS16949 is due to the customers demand from inside or outside the country. This means that it is important to obtain the certificate in order to compete in this global world. Besides that, other reason for applying this certificate is due to high competition between suppliers, the needs to achieve accreditation in international markets and to improve products and services quality.

Table 1: Comparisons on three case studies companies involved

Factors	X	Y	Z
Type of Automotive Component Manufactured	air- conditioning system	engine, brake, connector	electrical component
Year Certified to ISO/TS16949	2005	2004	2003
Duration	3 Years	4 Years	5 Years
Certification Factors	Customers requirement, method customization	Customers requirement, buyer competition, to penetrate into international markets and quality improvement	Customers requirement, business expansion, customers assurance and product acknowledgement
Implementation	Advanced Product Quality Planning (APQP)	ISO9000 + Basic tools -> Controlled planning	Advanced Product Quality Planning (APQP)
Certification Impact	Rejection rate decrease	Rejection rate decrease	Acquire new business and customers
Implementation Constraint	Time-consuming in acquiring certificate, low cooperation from all teams	Low knowledge from executive and non executive teams, low cooperation, document presentation	Difficult acceptance from senior employees, high labour cost

From earlier explanation, all three companies had implemented the ISO/TS16949 according to their own approach. On overall, it can be summarized that the ISO/TS16949 implementation are the combination of ISO9000 fundamental and basic tools such as the Advanced Product Quality Planning (APQP), Failure Mode and Effect Analysis (FMEA), Measurement System and Analysis (MSA), Statistical Process Control (SPC), and Production Part Approval Process (PPAP) in generating a controlled planning for quality assurance. Furthermore, the same impact was shown for all three companies that were certified with ISO/TS16949 is decrease in product rejection rate. The decreasing in product rejection rate means that the end product was able to fulfil customers' requirement which automatically reduce customers' complaints and rejection. Company Z had shown a tremendous ability in obtaining new customers and businesses due to its experienced in this ISO/TS16949 certificate application.

## CONCLUSION

From this case study it can be concluded that the ISO/TS16949 implementation is contributing to quality improvement. This had been shown by the study results from all three companies that acknowledge the ability of ISO/TS16949 to reduce product

rejection rate that lead to lower rejection rate from customers and thus able to fulfil the customers satisfaction. Since it is a new published standard, many factors are needs to be considered closely in ensuring the effectiveness in implementing the ISO/ TS16949. Proper planning, cooperation and motivation from all team members in the company are important in ensuring the success of the ISO/TS16949 implementation.

All automotive companies should acquire the ISO/TS16949 as a basic quality management system. Total Quality Management (TQM) is also needed for the company long term benefits. This is because ISO/TS16949 had secured a strong foundation in implementing TQM. The quality system and assurance that had been developed from the ISO/TS16949 implementation will increase the effectiveness and efficiency of TQM management process which can strengthen the effort of TQM implementation in the future.

Several suggestions are proposed in order to improve this case study:

- (a) To involve as many companies as possible in the case study in order to increase consistency and reliability in the results and comparisons.
- (b) Reassure and create agreement with the companies involved in the case study that the study result will be given to them as a reference and valuable basic information.
- (c) Try to obtain a quantitative data results measurement such as the number of the product rejection rate to support the study conclusion.
- (d) Conduct a study between the company that apply the ISO/TS16949 certificate with the company that doesn't obtain it to review and compare the implementation impacts.

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