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STRUCTURAL RELATIONSHIP BETWEEN OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION PRACTICES, OHSAS 18001 EFFORTS AND PERFORMANCE

AUNI FATIN NADIA BINTI CHIEK DESA

THESIS SUBMITTED IN FULFILLMENT OF THE REQUIREMENT
FOR THE DEGREE OF MASTER OF ACCOUNTING
(MANAGEMENT ACCOUNTING)
(MASTER BY RESEARCH)

FACULTY OF MANAGEMENT AND ECONOMICS
UNIVERSITI PENDIDIKAN SULTAN IDRIS

2015

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ABSTRACT

The aim of this study is to develop a model that incorporates Occupational Safety and Health Administration Practices (OSHAP), OHSAS 18001 efforts and Occupational Safety and Health Administration Performance (OSHAPM) in Malaysian automotive suppliers. Every company in manufacturing industry is compulsory to have a certification of safety to reduce accident or incident caused. However, before they have the certification they should implement OSHAP to decrease the management cost. A survey through questionnaire was conducted to determine the level of OSHAP implementation, OHSAS 18001 Efforts as well as OSHAPM measurement. 278 sets of questionnaire were successfully collected that brought to 69.50% response rate. Structural equation modelling technique was utilized to perform the required statistical analysis of the data survey. In order to test the reliability and validity of the instruments, reliability analysis, exploratory factor analysis and confirmatory factor analysis were carried out. The results are shown that OHSAS 18001 Efforts did assist directly in improving OSHAPM when implemented with OSHAP. This research also provides a fundamental and direction for researchers in further research and practitioners to constantly improve OSHAPM through the implementation of OSHAP and OHSAS 18001 Efforts.

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HUBUNGAN BERSTRUKTUR ANTARA AMALAN PENTADBIRAN KESIHATAN DAN KESELAMATAN PEKERJAAN, USAHA 18001 OHSAS DAN PRESTASI

ABSTRAK

Tujuan kajian ini adalah untuk mengenalpasti hubungan antara OSHAP, usaha OHSAS 18001 dan OSHAPM, dan membangunkan model yang menggabungkan elemen-elemen ini untuk pembekal automotif Malaysia. Setiap syarikat dalam industri perkilangan wajib mempunyai sijil keselamatan untuk mengurangkan berlakunya kemalangan. Walau bagaimanapun, mereka perlu melaksanakan OSHAP bagi mengurangkan kos pengurusan. Satu tinjauan melalui soal selidik telah dijalankan untuk menentukan tahap pelaksanaan OSHAP, usaha OHSAS 18001 serta pengukuran OSHAPM. 278 set soal selidik telah berjaya dikumpulkan dengan kadar tindak balas, 69.50%. Teknik struktur persamaan model telah digunakan untuk menguji analisis statistik yang diperlukan dalam data kajian. Dalam usaha untuk menguji kebolehpercayaan dan kesahan instrumen, analisis kebolehpercayaan, analisis faktor penerokaan dan analisis faktor pengesahan telah dijalankan. Keputusan menunjukkan bahawa usaha OHSAS 18001 tidak membantu secara terus dalam meningkatkan OSHAPM tetapi ianya dapat membantu apabila dilaksanakan dengan OSHAP. Kajian ini juga menyediakan asas dan hala tuju bagi penyelidik dalam penyelidikan lanjut dan pengamal untuk sentiasa memperbaiki OSHAPM melalui pelaksanaan OSHAP dan usaha OHSAS 18001.

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LIST OF ABBREVIATIONS

AFTA	ASEAN Free Trade Area
AGFI	Adjusted Good Fit
AIMS	Automotive Institute of Malaysia
AMOS	Analysis of Moment Structures
AT	Employee Attitude
CBU	Complete built-up
CC	Checking and Correction Action
CEPT	Common Effective Preferential agreements Tariffs
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Continual Improvement
CSF	Critical Success Factors
CSR	Corporate Social Responsibility
DOE	Department of Environment
DOSH	Department of Occupational Safety and Health
EC	Effective Communication
EEV	Energy Efficient Vehicles
EFA	Exploratory Factor Analysis
EI	Employee Involvement
FP	Financial Performance
GFI	Goodness Fit Index
HRM	Human Resource Management
IO	Implementation and Operation
KMO	Keiser Meyer Olkin
KVP	Kelab Vendor Perodua
LD	Leadership Style
MAI	Malaysian Automotive Institutes
MITI	Ministry International Trade and Industry
MOT	Ministry of Transport
MPC	Malaysia Productivity Corporation

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MR	Management Review
NAP	National Automotive Policy
OEMs	Original Equipment Manufacturers
OHSAS	Occupational Safety and Health Administration Systems
OSH	Occupational Safety and Health
OSHA Act	Occupational Safety and Health Act
OSHA	Occupational Safety and Health Administration
OSHAP	Occupational Safety and Health Administration Practices
OSHAPM	Occupational Safety and Health Administration Performance
PC	OHS Policy
PCA	Principal Component Analysis
PDCA	Plan-Do-Check-Act
PL	Planning
PMS	Performance Measurement System
PVA	Proton Vendor Association
QA	Quality Assurance
QC	Quality Manager
QM	Quality Management
R&D	Research and Development
RMSEA	Root Mean Square Error Approximation
ROA	Return on Assets
RTD	Road Transport Department
SC	Safety Culture
SEM	Structural Equation Model
SHE	Safety, Health and Environment
SIRIM	Standards and Industrial Research Institute of Malaysia
SP	Safety Performance
SPSS	Statistical Package for Social Sciences
TLI	Tucker Lewis Index
TQM	Total Quality Management
TR	Safety and Health Training
VTA	Vehicle Type Approval
WCM	World Class Manufacturing

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The sector's that involve large contribution to the economy and closely related to manufacturing and services industries is automotive industry. It is an important industry to the Malaysian economy. Malaysian automotive industry began with the importation of vehicles which then progressed to assembly operations and the development of the automotive component industry. Malaysia is a country that putting importance to progress in the automotive sector for economic development to a higher level economy (Hashim, Habidin, Conding, Jaya, & Zubir, 2012). The history of the Malaysian automotive industry occurs when the Malaysian government developed a policy to promote an integrated automotive industry to strengthen its Malaysian

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industrial development. The promotion have their own objective which are to establish the limitation of imports, the reduction of expenses in foreign exchange, the creation of employment and the development of the industrial sector (MGCC- Market Watch, 2011).

In the automobile industry, Malaysia has obtained much recognition regionally and internationally for its outstanding in achievements (Rosli, 2006). To ensure the product quality, durability and performance same as new components while maintaining sustainability of resources with automotive re-manufacturing practice of taking end-of-life parts to be modified and reconstructed, with warranty to make it match by Original Equipment Manufacturers (OEMs). Furthermore, Malaysia Automotive Institute (MAI) is also trying to set up the Automotive e-Community, a knowledge-based platform open to all the stakeholders right from industry, government and agencies, academia and also the public to share the information and latest updates domestically, regionally and as well as globally (MGCC- Market Watch, 2012; Han, 2013).

According to Mahidin and Kanageswary (2004), the automotive industry has succeeded in improving the country's economy at once fulfilling the government's industrialization efforts. Currently, Malaysia is trying to achieving Malaysia's Vision 2020. One of the key strategies in is the Malaysia Incorporated concept. Based on the concept, Malaysian companies need to assess the criteria of strategic goals, competitive marketing, quality products, competitive innovation, competitive human resource management, sense of national pride and professionalism. Our national carmakers work hard to achieve these criteria to enable them to have a field in the

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ASEAN and global market in future. Together enlarge the market with intense competition from Thailand and China's automobile industry. Since 2010, Malaysia is ASEAN's largest vehicle market with annual sales of more than 500, 000 vehicles and only 10% made and assembled overseas (MITI, 2010).

Generally, automotive industry is the most actively involved industry in the multiple practices such as quality effort, low production cost, continuous improvement activities, development of supply chains, and adaptability technology advanced. The practices involved because want to achieve World Class Manufacturing (WCM) which emphasize the systematic and effective practices in manufacturing process. Besides that, the organization's capabilities should provide worlds class performance element in their management process to achieve WCM such as reduce cost (Kennedy & Widener, 2008; Johansson & Siverbo, 2009), higher quality (Ittner & Larcker, 1995), higher motivation, and safety (Nachiappan, Anatharaman, & Muthukumar 2009).

In regards to that, WCM is a different set of concepts, principles, policies and techniques for managing and operating a manufacturing company. It is one of the broadest philosophies focusing primarily on production and includes more structural changes such as new production technology (Vokurka & Davis, 2004). Besides that, WCM is also a process-driven approach where implementations usually involve the following techniques such as high employee involvement, cross functional teams, multi-skilled employees, continuous improvement, and zero defects. Therefore, organization engaging in WCM strategies must focus on improving operations, strive to eliminate waste and create lean organizations.

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In relation to that, to achieve WCM, Malaysia has put the National Automotive Policy (NAP) as a basis and foundation of development and growth for the local automotive industry. The objective of NAP are to generate sustainable economic value that maximize the long term contribution of the automotive sector to the national economy and at the same time give the benefit for Malaysian consumer (MITI, 2010). Therefore, this industry still needs the support of government policies in order to become more competitive internationally.

The NAP aims to produce optimal transformation and integration of national industry into regional and global industry network. Expanding and competitive global environment requires urgent transformation. Consequently, the government has outlined the objectives of the national automotive sector as follows in Table 1.1 below.

Table 1.1

Objectives of the National Automotive Policy

- Ensure orderly development as well as long term competitiveness and capability of the domestic automotive industry as a result of market liberalization;
- Create a conducive environment to attract new investment and expand existing opportunities;
- Enhance the competitiveness of the national car manufacturer through strategic partnership;
- Foster the development of the latest, more sophisticated technology in the domestic automotive industry;
- Develop high value-added manufacturing activities in niche areas;
- Enhance Bumiputera participation in the domestic automotive industry;
- Improve safety standard for consumers and promote environment-friendly opportunities; and
- Enhance the implementation of current NAP's policy instrument

Source: MITI (2010) and Habidin (2012)

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Based on that, NAP describe the automotive organizations need to make any substantial changes in their management systems either in system maintenance, using the equipment, continuous improvement, investment in technology and innovation (Nachiappan, Anatharaman, & Muthukumar, 2009). Modern manufacturing requires that to be successful organizations must be supported by both effective and efficient maintenance. In relation to that, there is progress in the revision of the National Automotive Policy (NAP), which aims to enhance the competitiveness of the industry. Malaysia focuses on the automotive industry to become a regional hub for Energy Efficient Vehicles (EEV), which ensure the recruitment of high technology.

Three objectives in NAP 2012 are investment, technology and engineering as well as market expansion and outreach by providing a strategy for the development of the supply chain, ensure adequate manpower at all levels and also for safety and the environment. In review of NAP 2012, the Road Transport Department (RTD) was assigned to implement the Vehicle Type Approval (VTA) project in efforts to increase the safety. The Ministry of Transport (MOT) accords priority in the 10th Malaysia Plan for establishment of the VTA standards and testing facilities (MITI, 2012).

The global automotive industry should undergo a fundamental transformation due to increasing their performance through Occupational Safety and Health Administration (OSHA). One approach to improving the performance of maintenance activities is implementing and develops an Occupational Safety and Health Administration Practices (OSHAP). OSHA is practical information to assist automotive industry address employee protection and training as part of emergency planning for mass casualty incidents involving hazardous substances. OSHA considers

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as planning the first line of defense in all types of emergencies. According to the Occupational Safety and Health Act of 1970, the definition of OSHA is authorized to conduct workplace inspections and investigations to determine whether employers are complying with standards issued by the agency for safe and healthful workplaces such as automotive industry. OSHA also enforces Section 5(a) (1) of the Act known as the "General Duty Clause," which requires that every working people whether man and woman, they are must be provide with a safe and healthful workplace (OSHA Inspection, 2002).

1.2 Problem Statement

Every manufacturing industry is compulsory to have a certification of OHSAS 18001 to avoid from any incident or accident in emergencies caused. At DRB-HICOM, they committed to providing a safe and healthy working environment through periodic in-house safety checks in compliance with the nationally-recognized Health and Safety guidelines. The Group's Safety, Health, and Environment (HSE) Committee as a leader and guided by the provisions of the Occupational Safety and Health Act (OSHA Act), they closely same with various organizations including the Fire Department, Department of Environment (DOE), and Department of Occupational Safety and Health (DOSH) is to create a safe and comfortable working environment for all staff at the workplace. Regular fire drills are conducted to better prepare their employees for speedy evacuation in cases of fire emergencies (DRB-HICOM, 2012).

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Proton provides a large amount for annual allocation to do Research and Development (R&D) on vehicles manufactured by them. It also coincided with the NAP objective that encourages the development of high value added manufacturing activities in niche areas. Whereas, the OHSAS 18001 certification normally involve huge investments from various aspects, for example to buy new equipment and machines, importing experts from abroad, and provide training to subordinates.

However, before they have the certification of OHSAS 18001, Occupational Safety and Health Administration Practice (OSHAP) should implement in the company because it can assist to reduce the management cost (Geller, 2005). OSHAP are appropriate practice to manage the maintenance of safety and health at workplace. The maintenance issue became a major problem because it involves high costs that would hinder the safety condition at workplace. OHSAS 18001 Efforts were more emphasizes the continuous improvement concept that can be applied in OSHAP.

In this regard, there are some previous studies related to OSHAP and OHSAS 18001 Efforts in Malaysia (Puplampu & Quartey, 2012; Gokcek, 2010). However, it is very hard to find studies that examine the relationship between OSHAP and OHSAS 18001 Efforts and Occupational Safety and Health Administration Performance (OSHAPM). Therefore, this study was undertaken to fulfill the existing gap by examining the relationship between OSHAP, OHSAS 18001 Efforts and OSHAPM in Malaysian automotive suppliers. This research assists the industry through a systematic model of OSHAP, OHSAS 18001 Efforts and OSHAPM to be more comprehensive and comparative in quality management, maintenance process, continuous improvement application, cost reducing activities, and safety performance

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especially for car manufacturer and suppliers' in Malaysian automotive suppliers. Moreover, this study assist the automotive industry achieve objective in NAP by improve safety standard for consumers and promote environment-friendly opportunities.

1.3 Research Questions

Four research questions to be addressed during this research are:

1. Does OSHAP contribute to OSHAPM in Malaysian automotive suppliers?
2. Does OSHAP contribute to OHSAS 18001 Efforts in Malaysian automotive suppliers?
3. Does OHSAS 18001 Efforts contribute to OSHAPM in Malaysian automotive suppliers?
4. Does OHSAS 18001 Efforts mediate the relationship between OSHAP and OSHAPM in Malaysian automotive suppliers?

1.4 Research Objectives

The objectives of this study are:

1. To determine relationship between OSHAP and OSHAPM in Malaysian automotive suppliers.

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2. To determine relationship between OSHAP and OHSAS 18001 Efforts in Malaysian automotive suppliers.

3. To determine relationship between OHSAS 18001 Efforts and OSHAPM in Malaysian automotive suppliers.

4. To determine OHSAS 18001 Efforts mediate the relationship between OSHAP and OSHAPM in Malaysian automotive suppliers.

1.5 Significance of the Study

The implementation of OSHAP in Malaysian automotive suppliers becomes good business strategy that can be practiced on a large scale and give indirectly profit to the organization. Industries also become more competitive by maximizing the use of equipment, machinery, and plant toward reducing in waste. This study also provides a new perspective to the safety development in different ways by using continuous improvement in OHSAS 18001 Efforts.

The theoretical perspective in this study related to contingency theory and institutional theory. Based on the methodology perspective, this study used a quantitative research methodology. The quantitative data was analyzed using quantitative data analysis techniques. This was done with the help the Statistical Package for Social Sciences (SPSS) for window Version 20.0 was used to perform the

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required statistical analysis of the data from surveys. Secondly, the SEM Version 20.0 was used. Analysis of Moment Structure (AMOS) Version 20.0 has been selected to perform the SEM analysis in this study.

There are several researchers study about the implementation of OSHAP and OHSAS 18001 Efforts (Fernández-Muñiz, Montes-Peón, & Vázquez-Ordás, 2012; Chang & Liang, 2009; Kheni, Dainty, & Gibb, 2008; Akaner, 2003; Barling, Kelloway, & Iverson, 2003; Amedofu, 2002). Nevertheless, there are still lack of research related to the implementation of OSHAP and OHSAS 18001 Efforts in simultaneously and affect the OSHAPM. Therefore, this research provides a new dimension to the various parties to see that the maintenance system from the difference perspective.

Other than that, OSHAP and OHSAS 18001 Efforts assist better organization's management system and useful to top management to conduct operation efficiently. Top management provides guideline and training to the employees to implement this practice. Traditionally the top management gives orders to subordinates to perform certain tasks. In addition, this study also provides information to the government to distribute the provision to the automotive industry to make R&D such as Malaysia Productivity Corporation (MPC), Standards and Industrial Research Institute of Malaysia (SIRIM), Ministry of International Trade and Industry (MITI), and others.

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The automotive sector then was one of the major job suppliers for the young population (Sultana & Ibrahim, 2014). The provision can be reduced, if OSHAP and OHSAS 18001 Efforts fully utilized. The government can reduce the allocation cost for make R&D and it became more valuable for the country. Eventually, for the future research, this study also helps the researchers in the future with these items OSHAP, OHSAS 18001 Efforts and OSHAPM that has been collected to continue any research. It can be used as the reference to other researchers to review the scope of OSHAP, OHSAS 18001 Efforts and OSHAPM.

1.6 Scope and Limitation of the Study

In producing the more efficient and streamlined research, the scope focuses on two main areas as follow:

i. This research focuses on the relationship between the OSHAP, OHSAS 18001 Efforts, and OSHAPM measures for the automotive suppliers in Malaysia.
ii. Population and sample of survey respondents are only targeted to the automotive suppliers operating in Malaysia.

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Throughout the study, there are several limitations and weaknesses in this study.

i. The inherent limitations are time constraints, financial resources, and relationships that are not widely available. Therefore, this study only focused on the Malaysian automotive suppliers.
ii. The data collection process is very tough process and gives a new experience to researchers. Various methods used in the process of collecting data such as through e-mail, mail, visiting factories, and attending the supplier meetings.
iii. Some method that has been used in data collection involves the provision of substantial financial and time consuming.
iv. Researcher is quite difficult to obtain the feedback from consultant, suppliers and academic experts who are study in OSHAP and OHSAS 18001 Efforts to verify the instrument that has been used. The instrument validation is important to ensure that the objectives of the study can be achieved.

1.7 Research Framework

This thesis investigates how the good system and practice can build up the competitive advantage for consistent performance. Investments in such practices are associated with lower turnover rate and greater productivity and business financial performance (Black & Lynch, 2001; Golden, 2012). Ittner, Larcker, and Randall (2003) used a broad set of financial and non-financial measures of firm performance.

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The firms shall promote fitness and flexibility in a system to create a sustainable competitive advantage. According to the Rogers and Wright (1998) in a study stated that the major challenge for the performance built up is to establish a clear and consistent system.

In order to gain the good performance, the firm must be good at the implementation of the strategy or plan. The performance build-up structure is the firm performance which can be used as the feedback to review and to gain the performance. We need to decide whether the OSHAP, OHSAS 18001 Efforts can produce the high performance.

This study expects that there exists some processes to link these factors to produce the OSHAPM. OSHAP and OHSAS 18001 Efforts which is established under management division can be integrated with company strategy, core competency, and corporate structure to produce the consistent OSHAPM. The proposed theoretical model becomes the basic framework of this thesis.

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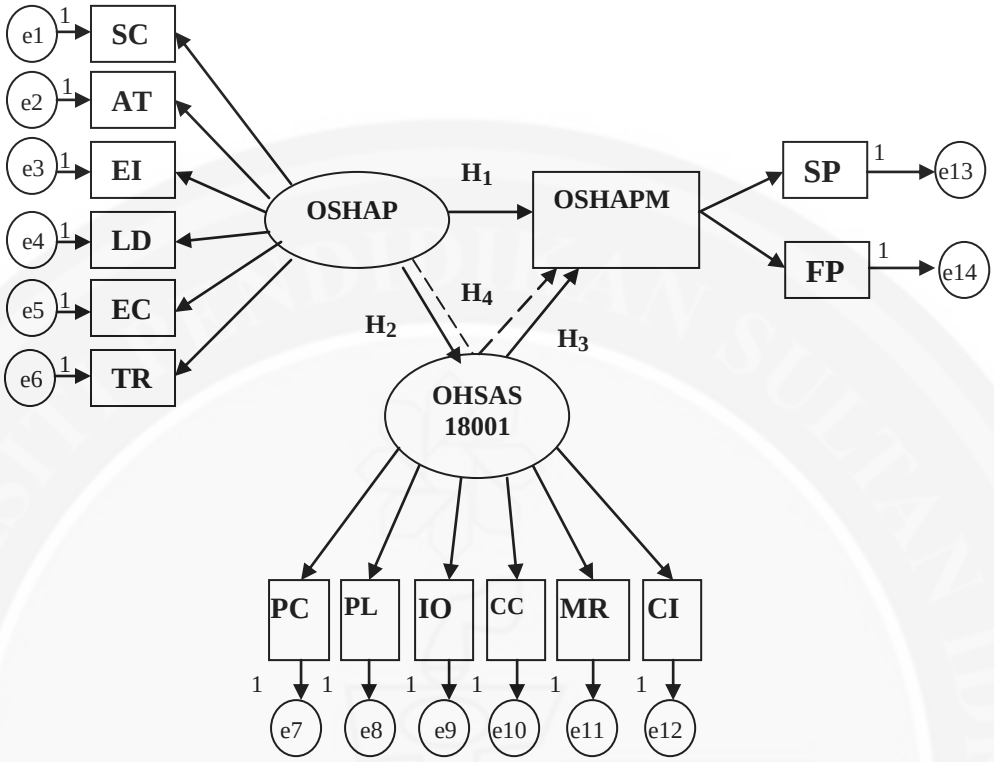


Figure 1.1. Conceptual Model between OSHAP, OHSAS 18001 Efforts, and OSHAPM. Adapted from "Structural Analysis and Toll for Lean Six Sigma, Strategic Control Systems and Organizational Performances" by N. F. Habidin, 2012, Engineering Doctorate (Engineering Business Management) Thesis, UTM Razak School of Engineering and Advanced Technology, Universiti Teknologi Malaysia.

*Note: OSHAP=Occupational Safety and Health Administration Practices, SC=Safety Culture, AT=Employee Attitude, EI=Employee Involvement, LD=Leadership Style, EC=Effective Communication, TR=Safety and Health Training, OHSAS 18001= Occupational Safety and Health Administration Systems (OHSAS) 18001, PC=OH&S Policy, PL=Planning, IO=Implementation and Operation, CC=Checking and Correction Action, MR=Management Review, CI=Continual Improvement, OSHAPM=Occupational Safety and Health Administration Performance, SP=Safety Performance, FP=Financial Performance

In the following sections the essential components of the proposed theoretical model was presented. The major concern in this thesis is how OSHAP works with OHSAS 18001 Efforts to improve the OSHAPM.

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1.8 Hypothesis

To understand the relationship of each OSHAP construct on OSHAPM through OHSAS 18001 Efforts in Malaysian automotive suppliers, the following hypotheses were set up to be tested. These hypotheses stated based on a numbering system from H_1 to H_4. This style of hypothesis statement is chosen due to the nature of answering hypotheses using SEM methods.

H_1: There is a positive and direct significant relationship between OSHAP and OSHAPM in Malaysian automotive suppliers.

H_2: There is a positive and direct significant relationship between OSHAP and OHSAS 18001 Efforts in Malaysian automotive suppliers.

H_3: There is a positive and direct significant relationship between OHSAS 18001 Efforts and OSHAPM in Malaysian automotive suppliers.

H_4: OHSAS 18001 Efforts mediates the relationship between OSHAP and OSHAPM in Malaysian automotive suppliers.

1.9 Research Design

Research design refer as a systematic process of collecting and analyzing information and data in order to increase the understanding of the phenomenon about which to be concerned or interested (Williams, 2007). Research design is a method which constructs to get the information to answer the research problem. It also builds to get the variable to be associated with other variables to create a fit conceptual model.

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In this study, the research design is a quantitative approach study using the survey method. According to Hair, Black, Babin, and Anderson (2010), the survey method is a method used to obtain general information through data collection which is often implemented using questionnaires. In relation to that, researchers used the survey method because this research design is suitable for getting the data from respondents and be able to answer the research questions. Then, the survey results divided into two parts, namely pilot study and actual study. The pilot study was done to ensure that the questionnaire's set is able to answer all questions and objectives of the study. In case, it is not meet with the question of the study, then it be fixed and improved for the actual study.

As such the main purpose of this study was to investigate the relationship between OSHAP, OHSAS 18001 Efforts, and OSHAPM. To see the impact factors and performance, the study using the SEM approach. SEM approach represents an evolution and a combination of two types of statistical methods, factor analysis, and structural equations models (Kaplan, 2000). In SEM variables could be either exogenous or endogenous. These characteristics allow SEM to handle indirect and multiple relationships. Due to these characteristics SEM is particularly adequate as a tool to model the complex relationships between travel behavior and land use patterns.

1.10 Operational Definition

In this study there is the use of some specific definition of a particular purpose. Operational definitions in this study are as follows:

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1.10.1 Occupational Safety and Health Administration Practices

According to Pecquet (2013), concern over personal safety is an inherent part of human nature. The need for safety is seen as a prerequisite to fulfilling higher order needs both personally and as worker motivation technique to improve productivity in organization (Schaufelberger, 2009). Moreover, accidents and injuries could be directly tied to increased costs and decreased production. OSHAP is an important asset to determine one's behavior and mindset as well as attitude towards self safety and safety of other at large. Thus, safety and health can be managed through proper planning, strong leadership, good organizing and effective coordination and control. Therefore, for this study describes that the OSHAP is a designed to maximize the effectiveness and improve efficiency.

1.10.2 OHSAS 18001 Efforts

OHSAS stands for Occupational Health and Safety Assessment Series. OHSAS 18001 is an international standard that describes the requirements for an occupational health and safety management system (OHSMS). This certification scheme is based on the Dutch version of OHSAS 18001:2007 OHSMS specification published and updated by BSI in London (published in a Dutch-language version by NEN in Delft). Guidelines for implementation have also been worked out in OHSAS 18002, in which the principles underlying OHSAS 18001 are described and the purpose, characteristic input, processes and characteristic output of each part of the specifications are discussed. In relation, for this study OHSAS 18001 Efforts is seen as one of standards that assist to ensure that operations become more smoothly and efficient by removing

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wasteful activities that are of no value from a customer perspective and assist in OSHAPM.

1.10.3 Occupational Safety and Health Administration Performance

Measuring performance is as much part of a health and safety management system as safety, financial, production or service delivery management (Hussain, 2009). Information from health and safety performance measurement is needed by the people in the organization who have particular responsibilities within the health and safety management system. These include directors, senior managers, line managers, supervisors, health and safety professionals and employees or safety representatives. Therefore, briefly the OSHAPM refers to the level of safety organization, effects from the implementation of several processes and influenced from specific factors. OSHAPM provide important tools for any enterprise that handles significant quantities of hazardous. OSHAPM assist organization understands whether risks of chemical accidents are being appropriately managed. The goal also assist organization find and fix potential problems before an accident occurs.

1.11 Summary

This research studies the relationship between OSHAP, OHSAS 18001 Efforts, and OSHAPM in Malaysian automotive suppliers. These research findings are expected to contribute to the theory and practice of quality initiatives within the automotive suppliers. This research provides academic contribution by giving empirical evidence

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and validation in the development of structural relationship model which at the same time result in the success factors of measurement instrument, strategic control and performance improvement in OSHA perspective. Furthermore, this study also fills the research gap by adding a reliable and useful source of literature in terms of OSHAs, benefits and challenges in implementing the OSHA for the purpose of improving OSHAPM.

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CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Chapter two are about Occupational Safety and Health Administration Practice (OSHAP), OHSAS 18001 Efforts, and Occupational Safety and Health Administration Performance (OSHAPM). The concept and current research was explained in this chapter. The structure of this chapter has been divided into nine main sections. The first section provides an overview of the Malaysian automotive industry. This is followed by an overview of OSHAP, definition of OSHAP, benefit of OSHAP, implementation of OSHAP in automotive suppliers, and OSHAP constructs. The third section overview of OHSAS 18001 Efforts, definition of OHSAS 18001 Efforts, benefit of OHSAS 18001 Efforts, implementation of OHSAS 18001 Efforts in automotive suppliers, and OHSAS 18001 Efforts construct. The fourth section provides review of Performance Measurement System (PMS) and the fifth section review of OSHAPM measurement. The sixth section provides review of relationship

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between OSHAP, OHSAS 18001 Efforts and OSHAPM. The seventh section provides generic framework of management accounting theory. Finally section is about OSHAP and OHSAS 18001 Efforts from Management Accounting (MA) perspectives and conclusion for this chapter.

2.2 Overview on Malaysian Automotive Industry

Over the last three decades, DRB-HICOM Berhad (DRB-HICOM) has evolved to emerge as one of the important engines of growth for the nation. At 31 July 2012, DRB-HICOM has a market capitalization of RM5.0 billion listed on the Main Board of Bursa Malaysia. Moreover, stability and seamless performance is a result of diverse business interests, as well as integrated approach with inclusive strategies. In the Automotive sector, DRB-HICOM proud to be the only establishment involved in the industry entire ecosystem and value chain. In DRB-HICOM, the Group's Safety, Health and Environmental (SHE) Policy is established to overcome concerns of health and safety in the workplace which is communicated to all employees. Employees are represented on the SHE Steering Committee in which, together with senior management members, they oversee the development of policies and best practices relating to health and safety issues (DRB-HICOM, 2013).

Nowadays, DRB-HICOM in the automotive industry is stronger with the recent addition of the national car manufacturer PROTON Holdings Berhad as their subsidiary. Overall, with world-class expertise and facilities, aspiration has been to assist position Malaysia as a regional hub of excellence for automotive solutions

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(DRB-HICOM, 2012). DRB-HICOM aims to assemble cars for the ASEAN market by 2015 and produce 40,000 units per annual, including for export. Sales of the company's cars made up 34% of the industry's total volume of 646,784 units in 2012 and the company is looking for more volume in future years (The Star Online, 2013a).

In line with changes in the automotive market, The ASEAN Free Trade Area (AFTA) was established in January 1992. It was initially made up of six countries, and has increased to ten by 1999. The aim of AFTA was to increase ASEAN's competitive edge and provide a complete production center for the global market. However, with full implementation of AFTA, competition became increasingly fierce among the national carmaker. The main instrument or mechanism in the realization of AFTA was the Common Effective Preferential agreements Tariffs (CEPT). Starting from January 1993, under the CEPT, Malaysia has to fully comply with minimum tariffs, 0-5 percent over 10 years of period. With this, the Malaysian automotive industry no longer is protected once the barrier is lifted (Ching, 2008).

After the expiry in 2003, Malaysia decided to delay the inclusion of 218 product tariff lines on Complete Built-up (CBU). The reason given was to provide time for domestic automotive industry to restructure them. In 2005, concerning to that, the automotive industry in Malaysia is one of priority a field under [Industrial Master Plan 3 (IMP3)] is coordinated by the Ministry International Trade and Industry (MITI). In 2006, MITI has introduced a National Automotive Policy (NAP) to promote the local automotive sector more competitive and enhance the development of the automotive sector more organized. NAP is seen an important basis for economic change towards a more develop. It is also able to change the mindset of

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individuals who are involved directly and indirectly to more creative and critical thinking in order to compete globally.

Therefore, for achieving NAP objectives and develop the national automotive industry, quality, maintenance, improvements practices should be incorporated in each management activities. It aims to improve the quality product of Malaysian automotive industry. Strategic approach can bring Malaysia to compete with overseas products, and can implement the AFTA without affecting the country's economic. The NAP still used until 2010, then some new improvement has done to the NAP to make increasing of performance automotive industry in Malaysia. In current year which is 2013, there are some important things to be highlight in NAP revision especially in the manufacture of EEVs for export.

According to The Star Online (2013b), International Trade and Industry Minister which is Datuk Seri Mustapa Mohamed said the government would be announcing the NAP on Jan 15, 2014. Besides the vehicle end-of-life policy, the NAP is expected to contain the roadmap to make Malaysia as the hub for EEV. The EEV policy is not new and has been anticipated by manufacturers like Honda which are already well into their investment programmers to make Malaysia their hubs for EEVs as ASEAN gets ready for the ASEAN Economic Community in 2015.

In middle of January 2014, the new NAP 2014 had unveiled at Menara Matrade by International Trade and Industry Minister, Datuk Seri Mustapa Mohamed. NAP 2014 expected to transform Malaysia’s automotive industry to be one of the important components for Malaysian economy. In 2013, the automotive industry

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contributed RM 30 billion to the national GDP and employs about 550,000 employees. The government has outlined the objectives of the NAP 2014 as follows in Table 2.1 below.

Table 2.1

The Objectives of the NAP 2014

• Promote a competitive and sustainable domestic automotive industry including the national automotive companies; • Make Malaysia the regional automotive hub in energy efficient vehicles (EEV); • Promote increase in value-added activities in a sustainable manner; • Promote increase in exports of vehicles and automotive components; • Promote participation of Bumiputera companies in the total value chain of the domestic automotive industry; and • Safeguard consumers' interest by offering safer and better quality products at competitive prices

Source: MITI (2014)

Based on the NAP 2014, the local automotive industry's contribution to GDP is increase to 10 percent. Vehicle production is expected to increase to the 1.35 million units. Meanwhile, in terms of employment, the automotive industry is expected to create 150,000 new jobs by 2020. In order to ensure the development of a sustainable automotive industry, government takes measures the country's automotive industry more competitive at inside and abroad. Apart from introducing new measures in line with the latest technological changes and developments of regional and global automotive industry, Malaysia aims to become a hub of EEV vehicles where the local production of hybrids and electric vehicles by 2015 (Huong & How, 2014; MITI, 2014).

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2.3 Occupational Safety and Health Administration Practices (OSHAP)

2.3.1 Overview OSHAP

OSH is one of key element of corporate social responsibility (CSR). Study by Zwetsloot (2010), CSR offers several opportunities to strengthen safety and health at work. There are six major opportunities which are (1) to achieve better integration of OSH into business processes, (2) to increase the strategic importance of OSH, (3) to foster innovative approaches, (4) to enrich OSH with value driven management, (5) to involve and commit new powerful stakeholders and (6) to integrate safety approaches that have been separated and sub-optimized so far. Many authors found that there can be synergies between CSR and improvement of occupational safety and health and working conditions in general (Garrido, 2008; Zwetsloot, 2010). CSR is rapidly changing the business context of safety and health at work.

Definition of safety is freedom from injury and danger, quality or insuring against hurt, danger of risk. The definition from New English Dictionary shows the same negative ideas, "exemption from hurt or injury mean freedom from harm and others". Hussain (2010) state that, OSHA as importance or target of safety to reduce the accidents among employee at the workplace (Hussain, 2010). In addition, McSween (2003) state that unsecured work behavior is referring to the result of (1) physical environment, (2) the social environment and (3) workers' experience within these. Meanwhile, the safety triangle shows relationships between the unsecured work situation and injuries that influence safety condition in automotive industry.

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Moreover, safety not only focus on the bottom line workers but it also influence the top management, manager and staff to become more responsibility and accountability in their efforts to provide the safe environment. Table 2.2 shows the summary of definitions every element in OSHAP from previous study. Average journal started from the year of 2000 until current year which is 2012. This table founded that many research interested to study about safety culture and leadership style. Most of the paper combined the elements such as employee attitude, employee involvement, safety and health training and effective communication in one element only which is safety culture. Construct of OSHAP was adapted and combination elements from previous study. The elements were taken as the OSHAP construct because combination of the elements is excellent to assist overall management in a company such as top management, middle management and below management.

Table 2.2

Construct of OSHAP

Constructs	Related Construct
Safety Culture	Safety culture (Flannery, 2001; Harvey, Erdos, Bolam, Cox, Kennedy, and Gregory, 2002; Alexander, 2004; Trujillo, 2011)
Employee Attitude	Employee attitudes (Yazdanifard, Danbala, Yusoff, and Dehi, 2011; Shah and Irani, 2010; Guest and Conway, 2007; Guerrero, 2008; Mester, Visser, Roodt, and Kellerman, 2003), Safety attitude (Harvey et al,. 2002), Attitudes (Elgood, Gilby, and Pearson, 2004)
Employee Involvement	Employee involvement (Cottini, Kato, and Nielsen, 2011; Maurer, Lippstreu, and Judge, 2008; Fuzi, Desa, Hibadullah, Zamri, and Habidin, 2012), Employee morale (Maksoud, Cerbioni, Ricceri, and Velayutham, 2010), Employee participation (Cabrera, Ortega and Cabrera, 2003), Employee satisfaction (Chen, Lee, and Tseng, 2012), Participation (Flannery, 2001)
Leadership Style	Leadership styles (Mester, Visser, Roodt, and Kellerman, 2003; Yahaya, Taib, Ismail, Shariff, Yahaya, Boon and Hashim, 2011; Obiwuru, Okwu, Akpa, and Nwankwere, 2011), Committed leadership (Cua, McKone, and Schroeder, 2001)
Effective Communication	Effective communication (Di Stefano, Imon, Lee, and Di Stefano, 2004), Communication Channel (Zohar, 2002)
Safety and Health Training	Safety training (McDonald, 2003; O'Toole, 2002; Huang, Ho, Smith, and Chen, 2006), Effective safety training (Zin and Ismail, 2012)

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2.3.2 Definition of OSHAP

Every country around the world remains in improving safety because safety is one of the main contributor to the high rates of serious and fatal occupational injuries (Bhattacharjee & Gosh, 2011; Zin & Ismail, 2012). Automotive industry is one of the industries that involve more to unsafe workplace after construction industry. The United States Bureau of Labor Statistics identifies the fishing, aviation, lumber, metalworking, agriculture, mining and transportation industries the more dangerous to employees (BLS, 2013). Based on the status of unsafe condition in automotive industry, organization should shaping employee's behaviors, attitudes and beliefs which lead to safety behavior and ultimately safety compliance are needs to adapt more holistic tactics and approaches by employer and employer not only focus on improving physical working environment (Zin & Ismail, 2012).

Generally, the employers are aware that they have a role to comply with safety programmed and play safe behavior. An approach providing legislative framework to enforce human behavior towards safety compliance by practicing high standards of safety and health at work to eliminate workplace accidents is the occupational safety and health (OSH) Act, 1994. However, the rise of issue on behavioral safety noncompliance because of the safety neglect attitude by the employers and employees (Jamal Khan, 2006). One important task to every employer in an organization should have put an effort to fight an issue on occupational accidents where there is a good understanding of the stage and pattern of accidents. The knowledge can give a good OHSAPM to organization.

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According to Zin and Ismail (2012), behavior that support safety practices and activities such as providing safety training and safety compliance explains the core activities that need to be carried by employees. Employer as guide to employees in ensures the implementation OHSAP is working with smooth without any problems. This is important focus of safety behavior according to occupational, safety and health requirements to prevent workplace accidents (Mahmood, Isa, Mustafa, Aziz, & Salleh, 2010). Safety behavior is the key decreasing the injuries at the workplace. Moreover, it is not directly influencing the result of the event before the accidents occurred (Johnson, 2003). Organization should control the injuries from become more serious and the rate of injuries getting higher every year by practicing the OHSAP and comply with OHSAS 18001 efforts.

2.3.3 Benefits of OSHAP Implementation

According to EU-OSHA, 2009 and Akpan, 2011, Table 2.3 shows the benefits of OSHAP. Its show the direct and indirect benefits in various aspects of the organization of occupational safety and health practices**.** Organizations with perfect OSHAP produce an excellent performance of safety.

Table 2.3

Benefits of Occupational Safety and Health Practice

Direct Benefits	Indirect Benefits
➢ Decrease insurance premiums	➢ Decreased absenteeism
➢ Decrease litigation costs	➢ Decrease staff turnover
➢ Decreased sick pays costs	➢ Increase corporate image
➢ Increased production/productivity rates	➢ Increased chances of winning contracts
➢ Decreased production and materials damage	➢ Increased job satisfaction/morale
➢ Reduced accidents production delays	

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2.3.4 The Implementation of OSHAP in Automotive Suppliers

Nowadays, in era of globalization of world to prevent the problem of continuous increasing percent in injured or accident, OSHAP are needed. This is because safety is often discussed in meetings as a priority but in reality, it often takes a low priority in issues associated with scheduling and budgeting decisions. In the budgeting decision about spending money on safety, many managers feel that safety is not vital to the success of the project. The implementation of OSHAP in automotive industry is very important. Willems (2007) mentioned that the management of OSHA is important. Every organization has different methods to manage their OSHA. Organizations need to comply with OSHA legislation to reduce the associated costs of accidents and illnesses and to create a safer and healthier workplace in their organization.

OSHA establishment of guidelines on occupational safety and health and clarifying where the responsibility lies is to maintain and promote the safety and health of workers for preventing industrial accidents and creating comfortable working environment (Occupational Safety & Health Act, 2012; Lee, Kim, & Kim, 2012). Willems (2007) also mentioned about monetary costs and productivity for OSHA measures. OSHA can be measured by the economic, productivity, accidents, illnesses, time lost, absenteeism, turnover, compensation claims, performance, motivation, and well-being and job satisfaction indicators. In relation, OSHA management practices can creates a decrease or an increase in certain measurement variables in organization.

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2.3.5 OSHAP Constructs

Based on the review of the extant literature, the author has summarized success factors to be as follows: Safety Culture (SC), Employee Attitude (EA), Employee Involvement (EI), Leadership Style (LD), Safety and Health Training (TR) and also effective communication (EC). Most of these factors were adopted and adapted based on safety and health practices study (Helmreich & Merritt, 2001; Uryan, 2010; Monge & Poole, 2009; Khot, 2010; Eyceoz, 2009; Lo, Ramayah, & Min, 2009; Yecchio-Sadus, 2007; Raines, 2011; Herman & Jeffress, 1998). Although these studies produced different results such as critical factor, they actually discovered a common set of practices that is required for the success of OSHAP implementation.

The OSHAP consists of the six major constructs (safety culture, employee attitude, employee involvement, leadership style, safety and health training and also effective communication) and 35 measurement items believed to be critical for OSHAP implementation in automotive supplies. Implementation of the OSHAP requires development and definition of the important elements. These important elements are described and defined as below. Table 2.4 shows the construct of OSHAP by several authors.

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Table 2.4

Constructs Definition of OSHAP, by Several Authors

Constructs	Operational Definition
Safety Culture	Safety culture in organization can form individual's beliefs, values, and behaviors because it creates advantages or disadvantages based on the message it gives to group members (Helmreich and Merritt, 2001;Uryan, 2010).
Employee Attitude	A views and beliefs of employees towards their work and it shaped by employee's work experience, and attitude regarding company's culture. Every workers develop different attitudes towards their work depending on their working environment and working methods in organization (Monge and Poole, 200; Khot, 2010)
Employee Involvement	Emotional and intellectual connection that an employee has, organization, manager, or co-workers that, in turn, influence them to apply additional discretionary effort to work (Eyceoz, 2009).
Leadership Style	A leadership can be summarized into five broad theories, namely, trait, behavioral, contingency or situational approach, contemporary integrative approach, and power and influence approach. Leadership can divide by two which are transactional and transformational (Lo, Ramayah, and Min, 2009).
Effective Communication	A Critical communication to the success of any safety program, in particular when changes to processes or procedures may affect worker safety. Effective communication must result in an understanding of the changes and a willingness to comply (Yecchio-Sadus, 2007; Raines, 2011).
Safety and Health Training	Prepare for future work responsibilities which are to provide the knowledge, skills and abilities to perform current jobs (Herman and Jeffress,1998)

2.3.5.1 Safety Culture (SC)

Generally, safety culture defined as involving perceptions and attitudes as well as the behavior of individuals within an organization (Harvey et al., 2002). For example, a top performing 1,000-employee location industrial manufacturer with proud recordable rates of under 0.7 injuries per hundred employees per year, learned the hard way after 3 fatalities within six months (Trujillo, 2011). The organization get lessons from the incident occur to their employees. According to Choudhey, Fang, and Mohammad (2007), an organization's ongoing Environmental Health and Safety

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performance is thought influence the employees' attitudes and behaviors in safety culture.

2.3.5.2 Employee Attitude (EA)

According to Shah and Irani (2010) organizational change reviews the abilities of managers, employees and work environment. It affects employee attitudes and behaviors because of moving from the familiar situation to the unfamiliar situation which can build up uncertainty, pressure and concerns among employees. Majority researchers focused on change that may have a serious negative impact on employee attitudes and productivity (Weber & Weber, 2001). Therefore, producing employee with positive attitudes and behaviors researchers advocated on employee preparedness as an important and major contributor factor for promoting effective and successful organizational change programmers.

2.3.5.3 Employee Involvement (EI)

Employee involvement mean the degree of commitment (Fuzi, Desa, Hibadullah, Zamri, & Habidin, 2012) worked in organizations and related to commitment, focus effort and energy (Macey & Schneider, 2008). Employee involvement is one of the important factors to encourage the positive impact on quality improvement (Abdullah, Uli, & Tari, 2008). Beside, Liau and Chuang (2004) pointed out that employee behavior plays an important role on customer's perception of service quality. Furthermore, educate and empower staff is one of the process improvement by involving all employee in the process of organization. Besides that, study by OHSA

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Guideline (2013), employee involvement should include several important items which are understanding and complying with the workplace violence prevention program and other safety and security measures, employee should participate in complaint and suggestion procedures covering safety and security concerns, incidents should report promptly and accurately, safety and health committees that receive reports of violent incidents participate by all employees, make facility inspections and respond with recommendations for corrective strategies and discusses appropriate responses.

2.3.5.4 Leadership Style (LD)

The implementation of safety practices is not possible success without support of all management in organization. According to Rexhepi and Shrestha (2011), top management is the most important of the Critical Success Factor (CSFs) in implementing the OHSAP. Therefore, leadership style is recognized as critical aspects and other quality systems (Najem, Dhakal, & Bennett, 2012). A good leadership in an organization result higher quality management to organization. Referred to the previous studies, organization cannot succeed unless it has safety and healthy culture, skilled workers, the buy-in from the top management and strong leadership (Najem, Dhakal, & Bennett, 2012). Shazali, Habidin, Ali, Khaidir, and Jamaludin (2013) in a study found that the level of continuous leadership commitment is a factor that considerably affected the outcome. External users can judge the organization by the outcome from the organization. They also can make decision whether should cooperate with them or not.

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Primary role in shaping management behaviors that in turn influenced employee behavior was under control of senior management leadership and they need to show to management level (Cooper, 2010). Warmick (2008), mention that leadership is the quality that transforms good intentions into positive action, in change a group of individuals into a team. Leadership enables the employer to guide the employee to take OSHA to the next level. For example, Michael, Guo, Wiedenbeck, and Ray (2006) found that between blue collar employees in wood product manufacturing facilities found that positive leadership affect safety behavior of the employees.

2.3.5.5 Effective Communication (EC)

Many accidents are found mainly caused by symptoms of safety non-compliance to safety requirements. Effective communications is an essential consideration to safe and efficient workplace. Leaders convey vision and values through interaction and communication. This is because effective communication leads to commonly understood goals and means to achieve them at all level. Other study stated that working between lower line workers and supervisors in maintenance of heavy duty equipment results the increasing communication channel and can cause to reduce in micro accidents and rise in using Personal Protective Equipment (PPE) (Zohar, 2002). In addition, Zin and Ismail (2012) in a study stated that communication can be achieved in three ways. Table 2.5 presents the three ways of communication. According to Dollard and Bakker (2010), positive safety culture values can permeate an organization if top management leads safety efforts by communicating and exhibiting the importance of safety to the organization.

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Table 2.5

Three Ways of Communication

Three Ways of Communication
• Through visible behavior, employer can communicate the importance of safety and health. However, through negative behavior employer can undermines the safety and health culture of the organization. • Health and safety policy statements reminds to employee and employer with written communication, statements concerning roles and responsibilities, performance standards and findings from risk assessments. • Make discussions between employer and employee face to face. It make employee feel they are important to involve in the management.

2.3.5.6 Safety and Health Training (TR)

Effective safety training is important to teach workers on potential of accidents, avoid accidents and potential hazards engaged in their jobs. Therefore, training and education programs play a significant role in improving of safety performance in organization and also important to enhance safety awareness among the employees and change behavior of employees (Wong, Chan, Tse, & Love, 2000). Safety training is carried out without systematic schedule which primarily to protect themselves and company is important because of something goes wrong with little expectation that it would influence the knowledge and behavior of employees in action (McDonald & Hrymak, 2003).

Thus, it seems clear that more than half of employees have to obtain knowledge about risks management through their experience of work itself. Lacks of safety training among employees are general root result of accidents because they did not have the knowledge, education and skills to recognized potential hazards at site (O'Toole, 2002). In addition, Zin and Ismail (2012) in a study found that safety

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training have strong linkage to employees' safety behavior improvement. Besides that, trainings aimed at workers and operator would not only decrease accidents, but it can also decrease costs and save lives.

Based on the implementation of OSHAP, organization creates multi-skilled revitalized employees whose morale is high and who has eager to come to work and perform all required functions effectively and independently. The company must invest on training employees to the proper use of their equipment.

2.4 OHSAS 18001 Efforts (OHSAS 18001)

2.4.1 Overview OHSAS 18001 Efforts

According to Zakuan (2009), ISO/TS 16949 is as mediating of structural analysis of total quality management and organizational performance in Malaysian and Thailand automotive industry. Besides that, investigate whether ISO 9001 certification affects perceptions of service recovery and consequently satisfaction, value and loyalty and if ISO 9001 enhances the relationships strength between constructs. The results showed ISO 9001 certification not influence on customers' perceptions of service recovery, satisfaction, value and loyalty. Nevertheless, to encourage satisfied customers to remain loyal to the firm, companies should consider ISO 9001 certification (Kabare, Kibera, & Munyoki, 2014). This research decided to study OHSAS 18001 Efforts as a mediating between OSHAP and OSHAPM.

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The importance of managing occupational health and safety is recognized by all interested parties which are employers, employees, customers, suppliers, insurers, shareholders, contractors, regulatory agencies and the wider community. The Occupational Health and Safety Assessment Series of Standards (OHSAS) sets out the necessary requirements for an occupational health and safety (OH&S) management system (NSAI, 2013). In addition, organizations of all kinds industry especially manufacturing industry are increasingly concerned with achieving and demonstrating sound OHSAPM by controlling their OH&S risks, consistent with their OH&S policy and objectives in OHSAS 18001 standards (BSI Group, 2007; DNV Business Assurance, 2008). Looking in the context of increasingly stringent legislation, the development of economic policies and other measures that foster good OHSAP, and increased concern expressed by interested parties about OH&S issues in industry and they need to do so (BSI Group, 2007).

Since, the OHSAS 18001 standard has launched the publications by British Standards Institution (BSI) its gained considerable acceptance worldwide (Fernández-Muñiz, Montes-Peón, & Vázquez-Ordás, 2012; Chang & Liang, 2009). Recently, various sizes and sector increasingly have implementing this standard in their organization (Chang & Liang, 2009; Chen, Wu, Chuang, & Mac, 2009; Fernández-Muñiz, Montes-Peón, & Vázquez-Ordás, 2012). The OHSAS 18001 specifies requirements for an organization to control its OH&S risks (Pun, Yam, a& Lewis, 2003; Zeng, Tam, & Tam, 2008). The risks that include are accident, injuries, increase of cost; reduce profitability, and increase employees turnover and others. All the risks listed affect the organization performance.

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According to the Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás (2012), the implementation of OHSAS 18001 standards leads to continuous improvement in the management via the integration of safety in all the organizational levels, and the use of methodologies, tools and activities of improvement. At the same time, OHSAS 18001 standard can decrease the number of accidents, material losses and damages in the production process, through the prevention and control of occupational risks. The decrease in the number of injuries, as well as cutting financial costs and has a positive impact on the motivation and satisfaction of the workforce in organization (Fernández-Muñiz, Montes-Peón, & Vázquez-Ordás, 2009).

In other to achieve continuous improvement, OHSAS 18001 become a tool for performance measurement on OHS using Plan-Do-Check-Act (PDCA) cycle. PDCA can briefly described as following (1) Plan with meaning of establish the objectives and process necessary to deliver result in accordance with organization OHS policy, (2) Do means the organization implement the process, (3) Check is the third item which mean monitor and measure process again OH&S policy, objective, legal, other requirement and then report the result. The last is Act which is taken the actions to continuously improve OSHAPM (Labodová, 2004; OSHA Project Group, 2007; Robson, Clarke, Cullen, Bielecky, Severin, Bigelow, Irvin, Culyer, & Mahood, 2007 and Chen, Wu, Chuang, & Mac, 2009). On the order hand, research by Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás (2012) and Vinodkumar and Bhasi (2011), several purpose of implementation OHSAS 18001 in organization are listed in the Table 2.6 below.

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Table 2.6

The Purpose of Implementation OHSAS 18001 Efforts

Implementation of OHSAS 18001
• To eliminate or minimize risk to employees and other interested parties who may be exposed to occupational health and safety risks associated with its activities. • Assure itself of its conformance with its stated occupational health and safety policy. • Demonstrate such conformance to others. • Implement, maintain and continually improve an occupational health and safety management system. • Make a self-determination and declaration of conformance with this OHSAS specification. • Seek certification/registration of its occupational health and safety management system by an external organization.

Basic standard requirements of OHSAS 18001 efforts include Occupational Health and Safety Policy (PC), Planning (PL), Implementation and Operation (IO), Checking and Correction Action (CC), Management Review (MR) and Continuous Improvement (CI). The construct for OSHAS 18001 Efforts is developed based on previous study. Table 3 present constructs of OHSAS 18001 efforts and Figure 2.1 show the model of implementation OHSAS 18001 in organization and it can apply to automotive industry in Malaysia.

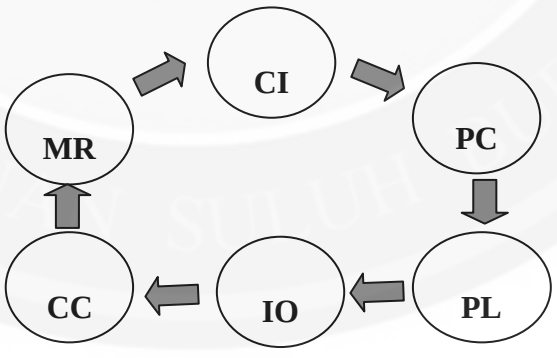


Figure 2.1. The Flow Model of OHSAS 18001 Effort. Adapted from "Occupational Health and Safety Assessment Series BS OHSAS 18001:2007. Occupational health and safety management systems – Requirements" by BSI Group, 2007.

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2.4.2 Definition of OHSAS 18001 Efforts

According to SIRIM (2012), OHSAS 18001 is the most widely used and recognized standard for Occupational Health and Safety Management Systems which enables an organization to control its risks and improve its performance in this area. Study by Hasle (2012), the ISO 9000 was inspired standards, especially the OHSAS 18001 (1999, updated in 2007) standard caused of the development of OHSA system standards and the associated process of certification (Zwetsloot, 2000). The International Labor Organization also published its OSHA System Guidelines in 2001 (ILO, 2001). An organization can grab opportunity from others if they have OHSAS 18001 certification in management. This is because a good performances resulted by the compliance to the standards.

The number of OHSAS certified companies in 116 countries more than doubled from 26,222 at the end of 2006 to 56,251 by the end of 2009. It was according to a survey done by the British Standards Institution. In year of 1999, OHSAS 18001 was designed to address the issue of plan-do-check-act at the functional management level to formulate a self-regulating OHSA environment (Pheng and Pong 2003; Ince, 2006). The objectives of OHSAS 18001 include creating and maintaining working environment in safe condition while protecting and maintaining workers with good health. Moreover, study by (Chen, Wu, Chuang, and Mac, 2009; Zutshi and Sohal, 2005), the implementation and certification of OHSAS 18001 systems have been an important undertaking for many organizations and have become a widespread phenomenon around the world.

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2.4.3 The Benefit of OHSAS 18001 Efforts Implementation

Research by Omran, Bakar, and Sen (2008) prove that implementation of OHSAS 18001 can help to reduce the accident rate. There are four benefits listed in their study which are 52.9% result to organization with improving their company image, which 50% improve productivity and working environment, 66.2% result for risk reduction on occupational safety and health accidents and last benefits is can be treated as a self with 45.6%. Santos, Barros, Mendes, and Lopes (2013), highlight the main benefits gained from the referred certifications are improved working conditions, compliance with legislation and good internal communication about risks and hazard. In addition, table 2.7 present the benefits of implementation OHSAS 18001 Efforts.

Besides that, OSHA also leads organization to consistently identify and control its health and safety risks, reduce potentials for accident, help follow the legislation and also improve OSHA performances. Table 2.9 present the summary studies show the effects of implementation OHSAS 18001 efforts to the performances by several researchers.

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Table 2.7

Benefits of Implementation OHSAS 18001Efforts

Authors/Literature	Benefits Implementation of OHSAS 18001 Efforts
Certification Europe, 2013	• Improved corporate image and credibility among stake holders, regulators, customers, prospective clients and the public • Adoption of international best practice in relation to risk management • Ensures health and well-being of employees, sub-contractors and the public • Minimization of liability of employers • Ensures legislative awareness and compliance
OHSAS 18001(QMS), 2013	• Reduces accident and incident rates • Improves the incident investigation process • Increases employee motivation • Reduce accidents • Demonstrate your commitment to health and safety • Increase productivity • Minimize the risk of legal action • Enhance your reputation and brand • Customer satisfaction • Reduced operating costs
National Quality Assurance (NQA), 2013	• Improved stakeholder relationships • Legal compliance • Improved risk management • Proven business credentials • Ability to win more business

According to Yang (2012), a set of problem-solving activities at different levels of abstraction in all phases of the system's life cycle is Safety Management (SM). The SM system model OHSAS consists of several fundamental elements which are PC, PL, IO, CC, MR and CI (BSI, 2007). The main reason for not using external accident information in companies is the lack of any systematic practices for reading and applying that information because a SM system requires good accident information for continual improvement in organization (Lind and Kivisto-Rahnasto, 2008). In addition, KC (2011) stated that implementations of OHSAS 18001 return the internal and external benefits to the organization. Table 2.8 shows the internal and external benefits of OHSAS 18001 to organization.

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Table 2.8

The Internal and External Benefits of OHSAS 18001

Internal Benefits	External Benefits
• Creates consistency throughout the organization built around "best practices". • Improves business performance. • Lessens dependency on key individuals. • Provides blueprint for controlled, disciplined growth. • Strengthens regulatory compliance. • Ensures consistent training. • Improves management oversight. • Facilitates continual improvement.	• Satisfies the demands of current or prospective customers for registration. • Boost international acceptance and credibility. • Increase acceptance by regulators, the general public, and other interested parties. • Elite category of businesses. • Prepared for external audits and inspections.

Table 2.9

The Finding of Implementation OHSAS 18001 Efforts to OSHAPM

Authors	Findings
Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás, 2009 and Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás, 2012	• A positive impact on the motivation and satisfaction of the workforce and increase OSHA performances.
Smallman and John, 2001	• Certification of OHSAS may strengthen the firm's relations with its shareholders and creditors, customers, suppliers, labor unions, insurers, or the public authorities, thereby increasing its bargaining power with them.
Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás, 2012	• OHSAS 18001 standards is a strategic tool offering an opportunity to firms that want to be competitive and to reach a strong position in a global market like the current one.

2.4.4 The Implementation of OHSAS 18001 Efforts in Automotive Suppliers

Study by Puplampu and Quartey (2012), highlight that Occupational health and safety practices have generally been given little research attention. As a result, occupational health and safety has continued to remain outside mainstream organizational and management researches (Barling, Loughlin, and Kelloway, 2002). Most countries and industries almost not recognize occupational health and safety practices as an important determinant of national development. Therefore, the occupational health

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and safety into national agenda becomes a crucial consideration for not only developed countries but also for the developing countries as well (Katsoulakos and Katsoulacos, 2007). The global automotive industry should undergo a fundamental transformation due to increasing their performance through OSHAP and OHSAS 18001 efforts.

In relation to that, to ensure the OSHAPM increasing continuously, an organization with OSHA practices should consistent with implementation of OHSAS 18001 efforts. Occupational health and safety requirements in many countries have become very important in recent years. According to Gokcek (2010), an OHSAS is a framework that allows an organization to consistently identify and control its health and safety risks, decrease the potential for accidents and injuries, assist to achieve compliance with health and safety legislation and continuous improvement of its performance.

Study by Akaner (2003) stated that OHSAS 18000 Occupational Health and Safety Assessment System Series intended to provide safer, more peaceful and healthier working environment to the workers. The OHSAS 18000 is an internationally accepted specification that defines the requirements for establishing, implementing and operating an OHSA Management System. It comprises two parts, 18001 and 18002 and embraces a number of other publications. Consistent to their OSHA policy and objectives, organizations of all types industry are increasingly concerned with achieving and practicing good occupational health and safety performance by controlling their OHSA risks. This is because refer to the context of

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increasingly better legislation and the development of economic and social policies those encourage better OHSAP.

Due to the implementation of OSHAP and OHSAS 18001 efforts in an organization of automotive industry, it drives to improve OSHAPM in organization. The major performances that focus in OSHAPM to increase by OSHAP and OHSAS 18001 efforts are Safety Performance (SP) and Financial Performance (FP). OHSAS 18001 efforts is a practice that emphasizes continuous improvement process. Furthermore, the manufacturing industry also needs a continuous improvement process to increase their OSHAPM.

2.4.5 OHSAS 18001 Constructs

Based on extensive review of the literature, this study has found elements of OHSAS 18001 that have been proposed by various researchers. The OHSAS 18001 framework by BSI Group, 2007 is selected for this study as the OHSAS 18001 framework of this study since it includes OHS Policy (PC), Planning (PL), Implementation and Operation (IO), Checking and Correction Action (CC), Management Review (MR) and Continual Improvement (CI); all important for standard control purposes. The OHSAS 18001 Efforts is a standard owned by a company if they understanding, implementation, and maintenance all elements from policy until continual improvement at all levels. Table 2.10 shows the construct of OHSAS 18001 Efforts by several authors.

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Table 2.10

The Constructs of OHSAS 18001 Efforts

Elements	Constructs	References
OHS Policy	1. Recognition of integral part of business performance. 2. Compliance to legal requirements. 3. Continual cost-effective improvement in performance. 4. Adequate and appropriate resources. 5. Setting and appropriate OHS objective. 6. OHS management as prime responsibility of line management. 7. Understanding, implementation, and maintenance at all levels.	Ramroop, McCarthy, and Naidoo. 2004; Bakri, Zin, Misnan, and Mohammed, 2006 and OHSAS 18001:2007
Planning	1. Extent to which your company hazard identification 2. Extent to which your company risk assessment and control 3. Extent to which your company in accordance with legal and other requirement 4. Extent to which your company objectives 5. Extent to which your company in OH&S management programme(s) 6. Extent to which your company design and development	Ramroop, McCarthy, and Naidoo, 2004; Bakri Zin, Misnan, and Mohammed, 2006; OHSAS 18001:2007
Implementation and Operation	1. Structure and responsibility 2. Training, awareness and competence 3. Consultation and communication 4. Documentation 5. Operational control 6. Managed and maintained	Bakri Zin, Misnan, and Mohammed, 2006; OHSAS 18001:2007
Checking and Correction action	1. Performance measurement 2. Monitoring 3. Accidents, incidents and non-conformances 4. Corrective and preventive action 5. Quality information 6. Conforming planning arrangement 7. Management system audit 8. Employee participation 9. Complement judgment and recommendations 10. Product audit	OHSAS 18001:2007
Management Review	1. Results of audits 2. Employee feedback 3. Process performance 4. Status of preventive and corrective action 5. Follow-up action from previous management review 6. Recommendations for improvement	Ramroop, McCarthy, and Naidoo, 2004; OHSAS 18001:2007; ISO 9001:2008
Continual improvement	1. Actions on results from analysis of data 2. Evaluation of suppliers 3. Achievement of objectives 4. Results from audits 5. Quality improvement proposals 6. Periodic review of controlled documents	OHSAS 18001:2007; ISO 9001:2008

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2.4.5.1 OHS Policy (PC)

OHS policy is the first stage in OHSAS 18001 Efforts. The PC is clearly defines the framework for occupational health and safety relevant objectives as well as a commitment to improving health and safety performance and compliance with relevant legislation, including prevention of injury and ill health. The effective communication and explanation of the policy from top management to employees, as well as ensuring that they are aware of their own obligations, is an important element. Because of that, it requires reviewing and where necessary, updating for continuous improvement (Bakri Zin, Misnan, and Mohammed, 2006).

2.4.5.2 Planning (PL)

PL is the second stage by establishing and maintaining procedures for the continuing identification of hazards, the assessment of risks and the implementation of necessary control measure. In this stage also need to identify of the legal and other relevant requirements those apply to the identified hazards. Then, developing of the occupational health and safety objectives and targets, which should documented and communicated throughout the organization and lastly establishing of programmers for achieving objectives and targets (Ramroop, McCarthy, and Naidoo, 2004).

2.4.5.3 Implementation and Operation (IO)

IO stage need to defining and communicating of roles, responsibility, accountabilities and authorities. Besides that, training of employees whose work can be associated

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with occupational health and safety risks. Moreover, the management play important role to create effective communication of the OHS policy, objectives and targets, and other elements of the system to employees and contractors. Top management also have identifying and describing of the core elements of the occupational health and safety management system, controlling of the management system documents and procedures, maintaining of documented procedures to control operations that could associate with occupational health and safety risks and last for the implementation and operation stage are establishing of an effective emergency preparedness and response plan to organization (OHSAS 18001: 2007).

2.4.5.4 Checking and Correction Action (CC)

After the stage of IO, follow by CC for top management to evaluate and report. In the stage of CC, monitoring and measurement of organization's OSHAPM include the proactive and reactive measures. Continuous by the management with dealing with nonconformance found in the OHSMS efficiently, including the actions to be taken to record, investigate and analyze incidents and initiating corrective and preventive actions. Identifying and maintaining of OHS records and conducting of occupational health and safety audits periodically also important in CC (OHSAS 18001:2007).

2.4.5.5 Management Review (MR)

MR implemented by top management in organization. Top management reviews periodically OHSMS in order to ensure, that the system is suitable, adequate and operating effectively. This review provides decisions and actions related to possible

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changes to occupational health and safety policy, objectives, targets and other elements of the management system, consistent with the commitment to continual improvement. OHSAS 18001 standard was developed to provide a method of assessing the occupational health and safety management systems in a way that is compatible with both standards ISO 9000 and 14000 series for the quality and environmental management systems in organization for a better result of performance (Ramroop, McCarthy, and Naidoo, 2004).

2.4.5.6 Continual Improvement (CI)

Continuous improvement (CI) is a management approaches that systematically include employee suggestions about enhance the development of different aspects of the production process. CI also defined as a planned, organized and systematic process of ongoing, increase and company-wide change of existing practices intended to improve company performance (Labodová, 2004). The CI implementation assists the requirements of OHSAS 18001 form fundamental principles for implementing performance measurement.

2.5 Performance Measurement System (PMS)

Performance measurement is an important central theme in management accounting. Performance measurement is involved in all aspect of a business management cycle. Valid performance measurement allows a firm to describe and implement strategy effectively, guides employee behavior, assesses managerial effectiveness, and

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provides the basis for rewards (Malina and Selto, 2004). Effective OSHAP and its relation to performance have been considered an important element when managing the interaction between people and systems (Abdullah, Spickett, Rumchev, and Dhaliwal, 2009). Accounting research and education on performance measurement splits, at the least, into four broad areas of inquiry (Rankin and Sayre, 2000; Walter and Pergola, 2008):

i. The first focuses on accounting as a performance measurement system that generates various reports for various purposes.
ii. The second is concerned with strategic measurement systems including both financial and non-financial measures designed, selected, implemented, used, and maintained by organizations.
iii. The third considers the role of performance measurement systems as part of management control systems in developing and implementing strategies, evaluating the achievement of objectives, providing feedback, and rewarding managers.
iv. The fourth analyzes empirically why, how and when accounting systems and processes relate to performance.

Furthermore, strategic performance measurement is a more comprehensive performance measurement defines the focus and scope of management accounting. Specifically the requirement is that management accounting practice must recognize and reflect the strategic choices made in organizations for management accounting to be relevant (Roslinder and Hart, 2002; Shank, 2007; Langfield-Smith, 2007).

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According to Bhimani (2007) stated that the strategic performance measurement process begins with setting goals by an organization. Typically, organizations look towards the maximum benefit in determining their objectives. However, the automotive industry is not just profit and financial performances are emphasized, even the non-financial aspects should also be emphasized such as safety performance (Ramroop, McCarthy, and Naidoo, 2004; Bakri, Zin, Misnan, and Mohammed, 2006; Hsu, Su, Kao, Shu, Lin, and Tseng, 2012; Sukadarin, Suhaimi, and Abdull, 2012; Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás, 2009; Khdair, Subramanim, and Shamsudin, 2011; Wu, Chen, and Li, 2008; Hussain 2009). Selection of strategic practices is able to improve financial and non-financial performance and driving their organizations to a higher level.

In relation to that, the non-financial measurement is also important to evaluate the organization performance as a whole. For the Malaysian automotive industry, other than profit, the level of safety is also important and highly encouraged in manufacturing activities in line with National Automotive Policy (NAP). Safety can be practices in many ways besides improving the safety and financial performance of the organization (Ford and Tetrick, 2008). In addition, safety is seen as a new perspective in the management accounting field that can have an impact on management activities. Therefore, in this study, more focus on the OSHAPM measurement. It is because to explain the importance and impact of the strategic practices implementation on OSHAPM.

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2.6 OSHA Performance (OSHAPM)

2.6.1 OSHAPM Overview

The measurement of occupational health and safety administration performance (OSHAPM) has traditionally focused on the measurement of outcomes, such as the lost time injury frequency rate, decrease of insurance premium, enhance company image to external users and others. There are two dimensions to be focus in this study which are safety performance and financial performance in organization. The performances have their own important to organization. The importance of the financial performance in any economy cannot be over-emphasized given the symbiotic relationship between the sector and the rest of the economy (Otto, Ekine, and Ukpere, 2012). In relation, efficient financial sectors are essential to attract gains from the world market, and as well insulate the domestic economy from external shocks.

The financial performance could also responds to the demand created as a result of economic development in the domestic economy. Besides that, Otto, Ekine, and Ukpere (2012) mention that theoretically the role of the financial sector can be summarized as follows (i) the financial sector generates wealth in the economy and facilitate the exchange of goods and services, (ii) it facilitates the process of resource mobilization (iii) it mobilizes savings and changes the term structure of savings (iv) it channels savings into productive investments (v) it promotes the integration of the domestic economy into the global financial system (vi) it improves the efficiency and productivity of investments (vii) it enables and enhances the smooth implementation of macroeconomic policies (viii) it acts as catalyst for rapid economic growth and

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development. The relevance role for this study is improved the efficiency and productivity of investment in management.

For example, there are several areas within an enterprise where performance monitoring can take place such us production, costs, environmental aspects and the health and safety of workers. Performance measurement is an essential aspect of monitoring and evaluating OHSAPM in an industry. One of the primary objectives of measuring OHSAPM is to provide feedback regarding health and safety performance (NOIHSC, 1999). The benefits associated with the introduction of a performance measurement system for OHS show in Table 2.11 and Table 2.12 present the list of authors that makes a research on OSHAPM measurement.

Table 2.11

The Benefits Associated with the Introduction of an OSHAPM Measurement

Benefits of OSHAPM Measurement	Source
▪ The ability to provide an indication of how an enterprise is performing in relation to OH&S issues. ▪ The ability to identify problem areas where adverse outcomes are occurring and subsequently to identify where preventive action should take place. ▪ The ability to document effects of attempts to improve OH&S. ▪ The ability to promote OH&S reviews of existing work practices and work organization. ▪ The use of performance measures for benchmarking or comparative performance assessments.	NOIHSC, 1999

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Table 2.12

Research on OSHAPM Measure

Performance measures	Authors
Safety Performance	Ramroop, McCarthy, and Naidoo 2004; Fitzgerald , 2005; Bakri Zin, Misnan, and Mohammed, 2006; Hsu et al. 2012; Sukadarin, Suhaimi, and Abdull, 2012; Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás, 2009; Khdair, Subramanim, and Shamsudin , 2011; Wu, Chen, and Li, 2008; Hussain 2009
Financial Performance	Ramroop, McCarthy, and Naidoo 2004; Bakri Zin, Misnan, and Mohammed, 2006; Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás, 2009; Akpan, 2011; Wilsems, 2007

2.6.2 OSHAPM Measurement

In order to have successful OSHAP, the construct should impacts on some performance measures. Performance measurement is common in any firm. Based on that, according to Ittner and Larcker (1998), managers need to focus on both financial and non-financial measures to achieve organizational goals. The balance comes from tracking not only financial performance measure but also non-financial ones as well. This is because non-financial measures been suggested by (Kaplan and Norton, 2001) that non-financial performance measure helps managers to assess changes in the business environments, determine and evaluate progress towards the firm's goal, and affirm achievement of business performance. The proposed OSHAPM consists of the two performance measures in ten measurement items which are safety and financial; they are measured by five items respectively.

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2.6.2.1 Safety Performance

Safety performance has been defined as overall performance of the organization safety management system in safe operation (Wu, 2001). Their study highlight that domestic and foreign shows that safety and health performance is more related to the safety climate of organizational behavior which combined with the scientific approach can significantly increase the safety and health performance.

Refer to the Table 2.13, this study strongly agree that OSHAP have a positive relationship between occupational safety and health performances. Several papers found that OSHAP affect the safety performance only but this study concludes that it possible effect both of safety and financial performances. Based on previous reviews, more researchers state that OSHAPM increase with implementation of OSHAP. It means the implementation of the OSHAP assist in Malaysian automotive company to increase performances especially in OSHAP.

Table 2.13

The Summary of Past-Related Research Based on Safety Performance

Organizational Performances Measure	Authors	Findings
Safety Performance	Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás, 2009	A positive influence between safety management practices with safety performances
	Khdair Subramanim, and Shamsudin, 2011	A positive significant relationship between leadership style, management practices and workplace safety performance.
	Vredenburgh, 2002 ; Ali and Subramaniam, 2009	Managerial practices have the similar view between safety performance and work place injuries as a significant linear relationship between the managerial practices and work place injuries.

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2.6.2.2 Financial Performance

Financial Performance (FP) can be define as how well a firm can use assets from its primary mode of business and generate revenues. This term is also used as a general measure of a firm's overall financial health over a given period of time, and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. Waste reduction can assist in saving costs as the cost of raw material and waste disposal costs lower while it is also able to prevent contamination (Kurapatskie, 2012). It also supports by Ghassemi (2002), organizations are looking for something more innovative and cost-effective as a step solution to reduce waste and inefficiency.

However, according to Porter and Lance (1995), this paradigm has been challenged by a number of analysts during the last decade. It was argued by Ambec and Lanoie (2008), basically improving a company's environmental performance not necessarily to an increase in cost but it also can lead to better economic or financial performance. According to Ambec and Lanoie (2008), there are certain factors need to be concern by the company to increase the financial performance if they implement environmental strategy and it is divided into several parts which are revenue; differencing products; selling pollution; costs of material, energy and service; cost of capital; and costs of labor. Firms have incentives to reduce the environmental damages if financial performance is positively related to environmental performance (Iwata and Okada, 2011). Table 2.14 below is the summary of past-related several research based on financial performance.

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Table 2.14

The Summary of Past-Related Several Researches Based on Financial Performance

Organizational Performances Measure	Authors	Finding
Financial Performance	Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás, *2009*	A positive influence between safety management practices with economic-financial performances
	Bakri, Zin, Misnan, and Mohammed,2006	OSH management practices earn positive return and advantages on their health and safety investment.

2.7 The Relationship between OSHAP and OSHAPM

According to Singer, Lin, Falwell, Gaba, and Baker (2009) the prior research has demonstrated a relationship between organizational culture or climate and organizational outcomes or productions, including financial (Mooren, Grzebieta, Williamson, Olivier, and Friswell (2014) and safety (Clarke, Rockett, Sloane, and Aiken, 2002; Brewer 2006; Stone and Gershon 2006) performance. Study by Singer, Lin, Falwell, Gaba, and Baker (2009) provide the evidence of a positive relationship between safety culture or climate and safety performance, providing support to reminds for continued effort to improve safety culture in organizations as a means toward decreasing potential safety events. A study by Gruman and Saks, (2011) focus on employee engagement in the performance management process may encourage performance improvement beyond that achievable through a conventional focus on performance itself.

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Many author mention the employee involvement as a key driver of individual attitudes, behavior, and performance as well as organizational performance, productivity, retention, financial performance, and even shareholder return (Bates, 2004; Baumruk, 2004; Harter, Schmidt, and Hayes, 2002; Richman, 2006). In fact, Macey, Schneider, Barbera, and Young (2009) have shown that among a sample of 65 firms in different industries, the top 25% on an engagement index had a greater return on assets (ROA), profitability, and more than double the shareholder value compared to the bottom 25%.

According to Quartey and Puplampu (2012), the low productivity and high medical and insurance bills were associated with ineffective employee safety and health practices while effective safety and health practices led to high profitability and high productivity. Besides that, based on a review of a number of theories by Demerouti and Cropanzano (2010) and Gruman and Saks (2011) concluded that employee involvement can lead to improve performance. Right Management (2009) in a report noted that research confirms that employee involvement leads to increase financial performance, increase customer satisfaction and increase employee retention. Safety culture is strongly linked to corporate safety performance, and that this association is not limited to particular sectors of industry (Wadsworth and Smith, 2009). There is a strong relationship between the level of employee involvement and performance. H_1 below are developing to prove the relationship between OSHAP and OSHAPM.

H_1: There is a positive and direct significant relationship between OSHAP and OSHAPM in Malaysian automotive suppliers.

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2.8 The Relationship between OSHAP and OHSAS 18001 Efforts

Study by Willems (2007) and Makori, Nandi, Thuo, and Wanyonyi (2012), OSHAP is also a key Human Resource Management (HRM) issue for organizations. OSHAP continues to be one of the most critical but highly criticized issues within the discipline of human resource. Furthermore, OSHAP is compulsory to exist in every organization not only for purpose of to comply with legislation and ensure workplace in safe and healthier condition. Thus, organizations that focus strongly on OSHAP can perform better than organization without OSHA management practices (Willems, 2007). Moreover, it becomes more important caused by the increasing pressure in globalization demands in the industry.

According to the implementation of OSHAP and the OHSAS 18001, previous study found that the OSHAPM status in organization is not enough if the organization only based on data of recorded accidents over the past three years. This is because the standard on OHSAS 18001:1999 (Zeng, Tam, and Tam, 2008) and revised on 2007 offers a good framework to employees and employers for safety condition in workplace. If the organization had this certification of this standard, it benefits more to organization.

The OHSAS 18001 specifies requirements for an organization to control its OSHA risks (Pun, Yam, and Lewis, 2003; Zeng, Tam, and Tam, 2008). According to Fernández-Muñiz, , Montes-Peón & Vázquez-Ordás (2012), the occupational health and safety standard OHSAS 18001 has gained considerable acceptance worldwide, and firms from diverse sectors and of varying sizes have implemented it. Despite this,

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very few studies have analyzed safety management or the safety climate in OHSAS 18001-certified organizations. There is a significant benefit for the organizations that have been implement OHSAS 18001:1999 such as increase employer awareness, reduce the accident risk and establish awareness among the employees in organization (Arifin, Aiyub, Awang and Razman, 2011).

H_2: There is a positive and direct significant relationship between OSHAP and OHSAS 18001 efforts in Malaysian automotive suppliers.

2.9 The Relationship between OHSAS 18001 Efforts and OSHAPM

According to SGS (2013), Occupational health and safety policies are important for employees. However, they are also increasingly essential for customers and other stakeholders in organization. Occupational Health and Safety Management systems certification to OHSAS 18001 is a strong sign of organization's commitment to employees' health and safety. In fact, many organizations implement an Occupational Health and Safety Management System (OHSMS) as a fundamental part of their risk management strategy to address changing legislation and protect their workforce and other persons working under their control.

SGS (2013) stated that OHSAS 18001 certification enables organizations to manage operational health and safety risks and improve performance which are safety and financial performance. The occupational health and safety standard OHSAS 18001 has gained considerable acceptance worldwide, and firms from diverse sectors

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and of varying sizes have implemented it. Despite this, very few studies have analyzed safety management or the safety climate in OHSAS 18001-certified organizations (Fernández-Muñiz, Montes-Peón & Vázquez-Ordás, 2012).

Implementing an OHSAS 18001 management system may look challenge. However, there are many significant benefits to an organization. Thus, by implementing this management system, an organization makes a firm commitment to the continual improvement of safety performance, which ultimately leads to a healthy and safe workplace (Oliver, 2012). In a study by Abad, Lafuente, and Vilajosana (2013), the adoption of the OHSAS 18001 is strongly explained by objective safety variables. Moreover, accident rates and labor productivity improve after the adoption of the OHSAS 18001 and the OHSAS 18001 is a strategic tool that helps achieve safety and operating outcomes.

H_3: There is a positive and direct significant relationship between OHSAS 18001 efforts and OSHAPM in Malaysian automotive suppliers.

2.10 The Relationship between OSHAP, OHSAS 18001 Efforts and OSHAPM

Numerous studies by several researchers below have shown that the OSHAP have impact on OSHAPM in organization. First of all, according to Surienty (2012), an effective implementation of the OSHAP could reduce accidents thus decreasing compensation paid. Furthermore, study by Teo and Phang (2005) has found that safety measures taken in the workplace can lead to better safety performance which mean

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every organization need to have a good management of safety to increase performance. Besides that, the OHSAS 18001 effort specifies requirements for an organization to control its OSHA risks (Pun, Yam, and Lewis, 2003; Zeng, Tam, and Tam, 2008).

Nowadays, organization should have a certificate of safety to show external user about the guarantee of safety. By improving OSHAPM, companies need to implement OSHAP and methods to reduce production costs, reduce the flow process, and to improve competitiveness. At the same time, the companies also need to verify the implementation of safety management system in their organization in accordance with OHSAS 18001. OHSAS 18001 was specifically developed to allow organizations to systematically control OHS risks and improve performance in organization. In addition, OHSAS 18001 provides employers with requirements for their health and safety management systems against which a third-party registrar can assess and certify them as a specification document. OHSAS 18001 also become tool for performance measurement on OSHA.

However, there are no previous studies have linked OSHAP and OHSAS 18001 efforts effect on OSHAPM. Based on the literature review for the first hypothesis until the third hypothesis, generally OSHAP and OHSAS 18001 give indirect impact on the OSHAPM in Malaysian Automotive Suppliers. Based on the study by researchers, the hypothesis was developing to test.

H_4: OHSAS 18001 Efforts mediates the relationship between OSHAP and OSHAPM Malaysian automotive suppliers.

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2.11 The Generic Framework of Theory Management Accounting

2.11.1 Contingency Theory Research

Study by Woods (2009), Chenhall (2003) and Reid and Smith (2000), contingency theories were developed from the sociological functionalist theories of organization structure such as the structural approaches to organizational. According to Mukhtar, Jailani, Abdullah, Yahya, and Abdullah (2009) and Magara (2013) in their study, contingency theory is an approach to the study of organizational behavior in which explanations are given as to how contingent factors such as technology, culture, and the external environment influence the design and function of organizations. In a study by Islam and Hu (2012), no single type of organizational structure is equally applicable to all organizations in the assumption. Rather, organizational effectiveness is dependent on a fit or match between the type of technology, environmental volatility, the size of the organization, the features of the organizational structure and its information system.

Contingency theory widely used in management accounting research area as a fit theory to measure in term of social, environment, financial, non-financial, economic, and technology level in organization. According to Islam and Hu (2012), the usage of contingency theory is summarized from review of management accounting research. Contingency theory has been applied in management accounting research in order to address three types of questions. These questions are about the fit between organizational control and structure, the impact of such fits on performance and investigation of multiple contingencies and their impact on organizational design.

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Study by Waweru and Uliana (2008) contingency theory also give the contribution in identified the relationship between the number of practices and variables used the contingency elements. Researchers study the changes in management accounting systems on organizational performance using contingency theory. This study was done at manufacturing companies in Canada. The finding in this study seen the changes in management accounting were best predicted by organization capacity to learn and these changes mostly occur in systems that support planning and control followed by those that support decision making.

Besides that, another study by Ramdan (2012), contingency theory approach to investigate the role of management accounting information in facilitating Management Control Systems (MCS) in large manufacturing companies. This study found that MAI usefulness accounts for a complete mediation effect only on the relationship between centralization and MCS effectiveness, while it accounts for a partial mediating role on the relationship between MCS effectiveness and the other three contingent variables of formalization, environmental uncertainty, and competitive strategy. There are two example researches used contingency theory in management accounting research. However, there are many researches involving the use of contingency theory in management accounting area in various industries.

As indicated previously, contingency theory studies postulate that organizational outcomes are the consequences of a fit or match between two or more factors. In a study by Van de Ven and Drazin (1985), the concept of fit in three approaches namely selection, interaction, and systems an approach has been defined.

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Firstly, in the selection approach is the interpretation of fit was that, if an organization wants to survive or be effective, it must adapt to the characterizations of its organizational context. In this view, organizational design is caused by organizational context. Most of the early contingency research studies adopted this approach to examine links between organizational context and design but they did not analyze organizational performance.

Second, fit is interpreted as an interaction effect of organizational structure and context on performance. Effective firms the correlations between technology, structural dimensions of vertical integration, delegation, authority and sophistication of control systems were more significant than for ineffective firms (Islam and Hu, 2012). However, in these studies, the differences in the correlation between context and design in the high and low performing organizations were not significant. Furthermore these studies did not show if the interactions between context and design were effective.

Third, another approach in the contingency theory literature with regard to fit is the systems approach. According to the systems approach, one can understand organizational design only by simultaneously investigating the contingencies, structural alternatives, and performance criteria existing in an organization. According to Van de Ven and Drazin (1985), contingency studies should be designed. Hence, the comparative evaluation of various forms of fit is possible and the design of organizational sub-divisions should be taken into consideration. Therefore, this study can be classified as an interaction approach study as it investigated the interaction between OSHAP and OHSAS 18001Efforts on OSHAPM.

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In another study by Venkatraman (1989) and Lin and Dang (2015) identified six perspectives of 'fit' in strategy research, namely which are fit as moderation, fit as mediation, fit as matching, fit as gestalts, fit as profile deviation, and fit as covariation. This study related with the perspective of 'fit as mediation'. This is because mediation tests the existence of a variable that intervenes between a predictor and an outcome variable, specifying the existence of an indirect effect. The mediator is anchored by a criterion variable and is assumed to account for a significant amount of the variance of the outcome variable when included in the model.

Full mediation reflects cases in which the direct relationship between the original predictor and the criterion variable disappears in the presence of the mediator such as the coefficient of the predictor is zero in the presence of the mediator. If the coefficient of the predictor is other than zero, partial mediation exists. This perspective recognizes 'the existence of a significant intervening mechanism between an antecedent variable and the consequent variable (Venkatraman, 1989). The Figure 2.2 and 2.3 below show the different framework between fit as moderation perspective and mediation perspective.

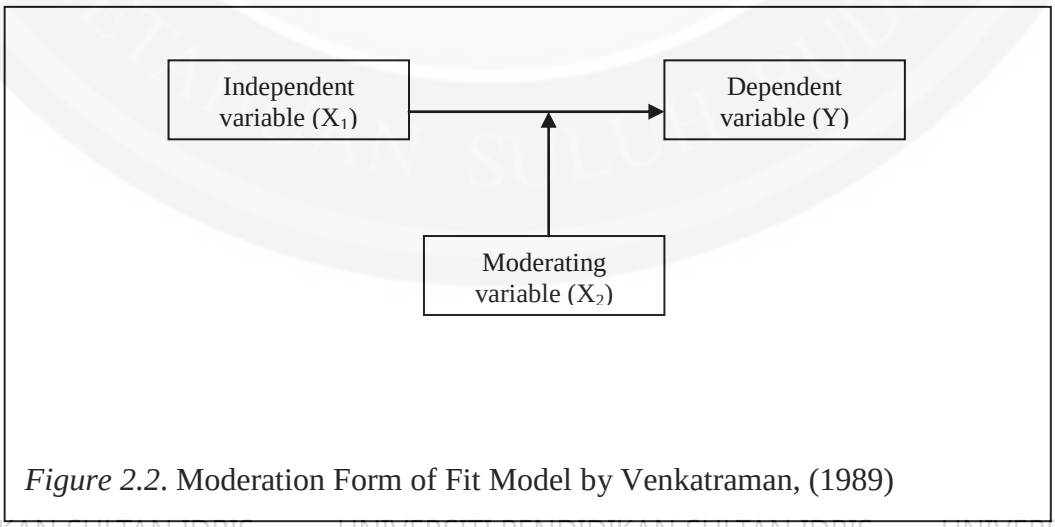


Figure 2.2. Moderation Form of Fit Model by Venkatraman, (1989)

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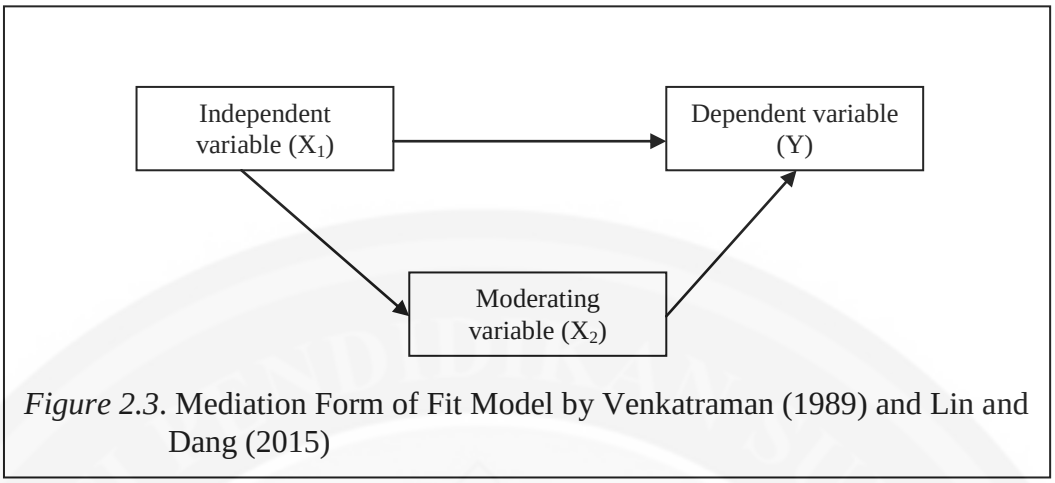


Figure 2.3. Mediation Form of Fit Model by Venkatraman (1989) and Lin and Dang (2015)

2.11.2 Institutional Theory Research

According to Scapens (2006) and Al-Htaybat and Alberti-Alhtaybat (2013), moving along from the economics-based domain to focus on organizational and social theories, institutional theory has now an established tradition in management accounting research investigating change in management accounting practices, with the earlier studies adopting New Institutional Economics, Old Institutional Economics and New Institutional Sociology.

Institutions lead to regularized or homogeneous behavior within a group, but institutions can often underline differences across nations, as well as industries, firms, and individuals. Institutional theory identifies three categories of institution which are regulative, normative, and cognitive. Institutional conflicts can take three forms. There are conflicts due to differences in rules or regulative institutions, differing institutional norms, and differing institutional values as codes can recode the anecdotes and subcategories that emerged from data. In addition, institutional theory can be used as an effective framework to describe exhaustively and categorize the unique challenges.

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Institutional theory provides a framework where practitioners and academics can differentiate between and understand the root cause behind the nature of a cross-national conflict (Mahalingam and Levitt, 2007). This theory is suitable with research for challenges in implementation OSHAP with OHSAS 18001 Efforts.

According to Rocha (2010), the study is analyzing the effects of OHSMS. It has been divided roughly between support for and criticism of these systems. This study explored new perspective by analyzing how different national institutional environments are likely to affect the functioning of OHSMS. The argument of this article is that such functioning is greatly dependent on the features of the national institutional environment in which such systems are implemented. The article discusses three ideal types of market economy. There are liberal market economy, coordinated market economy, and particularistic environment in relation to industrial relations systems, prevailing organizational templates, and patterns of skills formation. In this study, it is evaluates the possible impact of features on the functioning of OHSMS.

2.12 OSHAP and OHSAS 18001 Efforts in Management Accounting Perspective

Management accounting involves three main purposes which are decision-making, planning, and control. Malmi and Granlund (2009) assume that management accounting is the process of identification, measurement, accumulation, analysis, preparation, interpretation and communication of information used by management to

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plan, evaluate and control within an entity and to assure appropriate use of and accountability for its resources. Besides that, in a study by Quattrone (2009) rightly asks what management accounting involves. In line with the theory practice divide, management accounting has a theoretical scientific character.

For example, a scientific character, and a practical character, which reflects what happens to management accounting related in practice and how practitioner apply and utilize management accounting information (Al-Htaybat and Alberti-Alhtaybat, 2013). It is concerned with the provisions and use of accounting information to managers within organizations, to provide them with the basis to make informed business decisions that allow them to be better equipped in their management and control functions. The role of management accounting is to provide information for internal decision makers, typically managers.

According to Haron, Rahman, and Smith (2013), successful turnaround phases and of how management accounting practices played a significant role in improving performance. Organization provided internal documents to cover the period of the study and permitted access to key individuals to elaborate and clarify the motives which underpinned the numbers reported and also the strategies employed. The success of the corporate turnaround to be attributable to an effective leadership style that was able to motivate and support the employees whilst making strategic changes to the organization's capital, financial well-being and operations. Leadership style is one of variable in OSHAP. It means OSHAP can categories in management accounting practices.

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MA information is also needed for safety-related investments and interventions. Nevertheless, the tradition of utilizing methods of MA is not well established in safety related decision making. Safety indicators traditionally used to provide information include output indicators and intermediate indicators. Output indicators such as the accident rate and lost days. While, intermediate indicators such as safety climate scores and safety training (Tappura, Nenonen, Heikkilä, Reiman, Rasa, and Ratilainen, 2014) is often stated that overall OHS costs must be made explicit to motivate managers to take OHS issues into account in their decision making (Tappura, Nenonen, Heikkilä, Reiman, Rasa, and Ratilainen, 2013).

The costs of occupational accidents, as well as health and safety costs, have been the subject of many studies. According to Venkatraman (1989), this study related with the perspective of 'fit as mediation' in contingency theory. This is because mediation tests the existence of a variable that intervenes between a predictor and an outcome variable, specifying the existence of an indirect effect. The mediator is anchored by a criterion variable and is assumed to account for a significant amount of the variance of the outcome variable when included in the model.

However, OSHAP and OHSAS 18001 Efforts in management accounting perspective have produces very limited literatures. Therefore, future research for this issue is essential to gain more result about the importance of safety in management accounting. Safety usually noted in operation of management accounting. In relation to that, safety and health issue need more attention in management accounting researcher in the future.

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2.13 Summary

This chapter has reviewed the literature on OSHAP, OHSAS 18001 Efforts and OSHAPM measures relating to the automotive suppliers. It has provided an extensive review on the transition of quality initiative toward OSHAP definition, benefit of OSHAP implementation and current OSHAP research and trends. Besides that, an overview of OSHAPM has also been presented. Performance measurement was explored in a multiple perspectives and then the relationship between OSHAP and OHSAS 18001 Efforts is reviewed. Next, it also gives reviews on the literature regarding OHSAS 18001 Efforts. In conclusion, the recommendation of previous authors and gap of the study, there is a need to analyze the relationship between OSHAP, OHSAS 18001 Efforts, and OSHAPM in Malaysian automotive suppliers. The next chapter demonstrates the development of research model.

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CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this chapter is to describe about method and procedure that have been used in this study. The methodology clarifies about a framework design to execute a study. It is discussion about methodology section, a detailed explanation is provided on questionnaires development, expert validation, pilot study, population and sampling of the study, reliability, validity, and statistical analysis. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are also discussed in order to proceed on the discussion of the procedures of Structural Equation Model (SEM).

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3.2 Research Design

Research design is a quantitative study using the survey method. The survey method is a method used to obtain general information through data collection which is often implemented using questionnaires (Hair, Black, Babin, & Anderson, 2010). In relation to that, researchers used the survey method because this research design is suitable for getting the data from respondents and be able to answer the research questions. Then, the survey results divided into two parts which are namely pilot study and actual study. To ensure that the questionnaire's set is able to answer all questions and objectives of the study, the pilot study was implemented. In case, it is not suitable with the question of the study, then it be changed and improved for the actual study.

The main purpose of this study was to investigate the relationship between Occupational Safety and Health Administration Practices (OSHAP), OHSAS 18001 Effort and Occupational Safety and Health Administration Performance (OSHAPM). To see the impact factors and performance, the study using the SEM approach. According to Kaplan (2000), SEM approach represents an evolution and a combination of two types of statistical methods, factor analysis, and simultaneous equations models. SEM variables could be either exogenous or endogenous. These characteristics allow SEM to handle indirect and multiple relationships. Due to these characteristics SEM is particularly adequate as a tool to model the complex relationships between travel behavior and land use patterns.

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3.3 Overall Structure of Research Methodology

There are three phase in this research methodology which are critical literature review, data collection and analyze data collected. The first phase was carried out to find previous studies about the development of the automotive industry in Malaysia. Taken together, in these studies also describe about the study of OSHAP, OHSAS 18001 Efforts, OSHAPM, and SEM application. Researchers also need to look for the effectiveness implementation factors of OSHAP and OHSAS 18001 Efforts. This activity is conducted to identify that the OSHAP and OHSAS 18001 Efforts have direct and indirect impact on the OSHAPM in the Malaysian automotive industry.

The second phase is a rather difficult phase. The questionnaire that has been made sent to experts for validation. This activity should be performed to confirm the questionnaire constructed that were truly quality to be distributed for selected companies. In case there are some errors, researcher needs to make improvements on the questionnaire. After that, a pilot study conducted by distributing questionnaires has been validated by expert to Malaysian automotive companies.

The third phase focuses on activities to analyze data collected. The data obtained included in SPSS format, and analyzed the data use SPSS and SEM technique. The results of the analyzed data made discussion and comparison based on the previous studies. Lastly, the researcher makes conclusions and recommendations for future research to make future research more smoothly and deeply. The Figure 3.1 show that the overview of overall structure research methodology.

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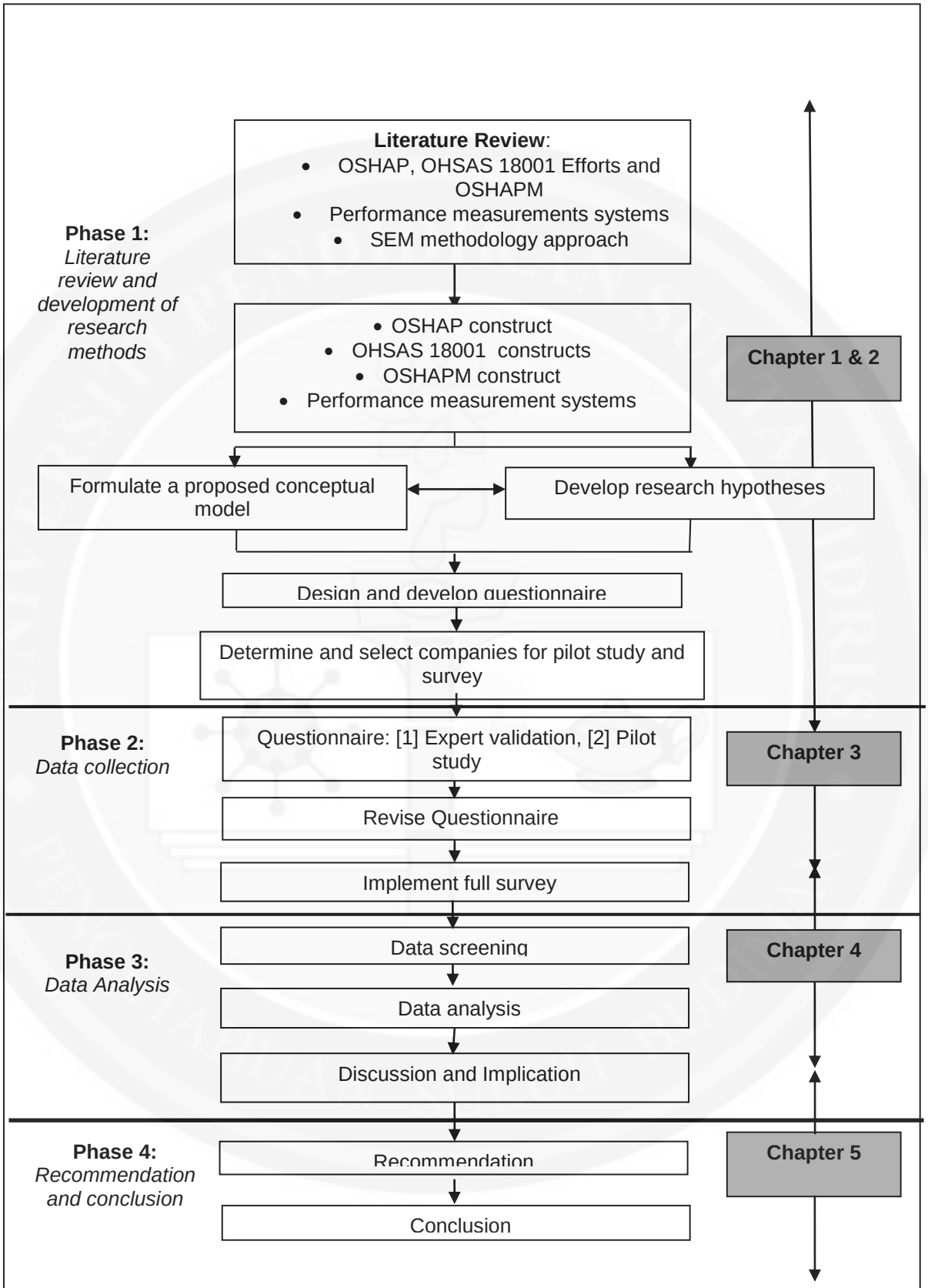


Figure 3.1. Overview of Overall Structural of Research Methodology. Adapted from "Structural Analysis and Toll for Lean Six Sigma, Strategic Control Systems and Organizational performances" by Habidin, 2012, Engineering Doctorate (Engineering Business Management) Thesis, UTM Razak School of Engineering and Advanced Technology, Universiti Teknologi Malaysia.

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3.4 Survey Methodology

One of the objective lists in chapter one is to examine the instrument in OSHAP, OHSAS 18001 Efforts, and OSHAPM in Malaysian automotive industry. Questionnaire surveys are commonly used by researchers to obtain research data. In this study, the use of questionnaire is consistent with aspects of cost reduction, saving time, and energy because do not have frequently meet the respondent. The construction of the questionnaire, validation from expert, pilot study, population and sample, data collection, reliability, validity, and statistical analysis are explained later in the next subtopics.

3.4.1 Questionnaire Development

Questionnaire's construction is based on conceptual models that have been proposed by researchers through the previous studies related to OSHAP, OHSAS 18001 Efforts, and OSHAPM. The questionnaire was developed by adapted from the previous studies which are related with this research (Hussain, 2009; Kaluza, et al., 2012; Sukadarin et al., 2012). In addition, the current issues are also taken into consideration so that this study is more useful for industry to become reference. The questionnaire that has been constructing was divided into four parts. There are general information, perception on OSHAP, perception on OHSAS 18001 Efforts and perception on OSHAPM measures. The questionnaire was used the seven-likert scale, representative a range from very low = 1, slightly low = 2, low = 3, medium = 4, high = 5, slightly high = 6 and very high = 7 which has been used by management research (Brevers, Cleeremans,

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Bechara, Greisen, Kornreich, Cerbanck and Noe, 2012). The Table 3.1 below show the summary of survey questionnaire design.

Table 3.1

Summary of Survey Questionnaire Design

Section	Topic	No. of question, Construct and item	Question/ Likert Scale	Sources
1	General information	8 questions	Years in business, ownership, number of employees, group of product, quality systems certification, current position, period of current position and quality award won.	-
2	OSHAP	6 constructs and 33 measurement items	7 likert scale: [7] Very High to [1] very low	Gokcek (2010); Brevers, Cleeremans, Bechara, Greisen, Kornreich, Cerbanck and Noe (2012), Yang (2012)
3	OHSAS 18001 Efforts	6 constructs 29 measurement items	7 likert scale: [7] Very High to [1] very low	Ramroop, McCarthy, and Naidoo (2004); Labodova (2004); Bakri Zin, Misnan, and Mohammed (2006)
4	OSHAPM measures	2 measure and 10 measurement items	7 likert scale: [7] Very High to [1] very low	Hussain (2009); Akpan (2011); Khdair, Subramanim, and Shamsudin (2011)

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3.4.2 Expert/Content Validation

According to Zakuan, Yusof and Shaharoun (2009), mention that the rigor in instrument validation and model testing has become a growing concern in quality management research. Development of better quality management measurement instrument with high degree of validity, stability, and reliability is needed to further expand and empirically test the quality of management theories. Despite the fact that poor measurement properties of instrument can lead to erroneous conclusions, there are still many empirical quality management research that failed to attain the minimum requirement of reliability and validity.

The final draft of the questionnaire was sent to the OSHAP and OHSAS 18001 experts involving international university academicians, OSHAP and OHSAS 18001 consultant, as well as OSHAP and OHSAS 18001 automotive practitioners while obtaining expert validation as shown in Table 3.2. Comment and feedback given were then used in the correction and improvement of the instrument to gain content validity. Detailed analysis was done on each feedback and comment, and they were incorporated in the modification of the questionnaire before the survey was carried out. Most of the responses received were in positive tone and it was remarked as interesting and worth researching project. Besides that, by this process also, survey items were deleted and amended. Table 3.3 shows a summary of the experts and practitioners' comments and suggestions.

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3.4.2.1 Selection of Expert Panel (Participant)

Selection of expert validation is very important to validate the questionnaire is applicable or unsuitable in this research. The nomination of people, who would be appropriate "experts" for this study, was based on the two perspectives which are academician and industrial. The following are criteria of perspectives.

For Academician Expert

i. Participants must have five years of experience in conducting research in OSHAP and OHSAS 18001 Efforts, and OSHAPM in automotive industry.
ii. Research interest in area of OSHAP and OHSAS 18001 Efforts, and OSHAPM.

For Industrial Expert

i. Currently working as General Manager/Chief Executive Director, QE/Quality Assurance (QA)/Quality Control (QC) manager.

Table 3.2

Feedback from Expert OSHAP and OHSAS 18001 Efforts

Expert	Respond
DZ	***
ZSZ	***

Note: * No respond
** Give a respond but not provide with comment
*** Give a respond and provide the comment

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Table 3.3

Position of the Panel of Experts (Feedback)

Name	Position of Expert
	Academician (Management Accounting expert)
DZ	Lecturer (Management Accounting), Universiti Utara Malaysia, Malaysia
	Industrial Expert
ZSZ	Section Manager, Vendor Improvement and Education Vendor

Table 3.4

Summary of Comments and Suggestions from OSHAP and OHSAS 18001 Experts and Practitioners

Section	Expert comment
General comments	• Questionnaire looks reasonable. • Questionnaire's design looks great. • The scales are balanced and the items and instructions appear to be clearly worded. • Use the validated item in questionnaire. • Use the 7 likert scale is reasonable.
OSHAP	• Question for OSHAP section, make sure no repeat question. • Use simple and clear sentences.
OHSAS 18001	• Question for OHSAS 18001 section needs to reword. • Need to make sure that question understand by participate
OSHAPM	• Expand the questions in OSHAPM section

3.4.3 Pilot Study

A pilot study was conducted before the actual study started. The pilot study conducted in this study was to test the reliability and validity of the questionnaire that to be used in the actual study. Among main purpose of the pilot study are:

i. Determine and ensure instructions to answer were clear and understandable.
ii. Determine the suitability and comprehension items.
iii. Determine whether the language used is correct and easy to understand.

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The Proton companies' suppliers in the Tanjung Malim and Bukit Beruntong, Selangor area was selected to collect data pilot study. To collect the data, 50 set of questionnaires were distributed. However, from the 50 questionnaires sets were distributed, only 27 questionnaires collected. This pilot study data were analyzed using SPSS software. The aspect that has been analyzed is the first part of the questionnaire of years in business, ownership, number of employees, group of product, quality systems certification, current position, period of current position and quality award won.

Table 3.5

The Profile of the Respondent (n=27)

Constructs/measures	Frequency	Percent
Types of ownership		
100% local	12	44.4
100% foreign	3	11.1
Joint venture	12	44.4
The number of year in business		
Less than 10 year	4	14.8
10 to 20 years	4	14.8
More than 20 years	19	70.4
Types of product manufactured[1]		
Metal	15	55.6
Plastic	2	7.4
Rubber	2	7.4
Engine/Transmission	5	18.5
Electric/Electronic	3	11.1
Others	4	14.8
Number of employee		
Less than 50	1	3.7
Between 50 to 150	6	22.2
Between 151 to 300	14	51.9
More than 300	6	22.2
Current position		
Senior management	3	11.1
Middle management	15	55.6
Others	9	33.3
Current position (years)		
Less than I year	5	18.5
1 to 3 years	3	11.1
3 to 6 years	3	11.1
More than 6 years	16	59.3
Company certified to quality system standard[2]		
ISO 9001:2008	12	44.4
ISO TS 16949	6	22.2

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Constructs/measures	Frequency	Percent
ISO 14001	15	55.6
OHSAS 18001	3	11.1
None	0	0
Others	1	3.7
Company have won quality award[3]		
Prime Minister's Quality Award	0	0
State quality award	0	0
Industrial Excellence award	3	11.1
Quality Management Excellence Award	9	33.3
None	12	44.4
Others	6	22.2

[1]Note: Some companies have more than one product type
[2]Note: Some companies have more than one certification
[3]Note: Some companies have won more than one quality award

The author evaluated the common measure of construct reliability of the questionnaire through Cronbach's alpha measure to test the internal reliability. Study by Hurum (2005) and Randall (2006), reliability is concerned with the consistency, accuracy, and predictability of specific research findings. According to Sijtsma (2009), in a study mention that Cronbach's alpha was calculated to assess the reliability of the revised survey scales and Cronbach's alpha is a measure of internal consistency such as the degree to which items in a given scale are correlated.

Study by Lance, Butts and Michels (2006), the recommended Cronbach's alpha value used in the study follows criterion that is 0.7 for minimum acceptable value (exploratory research), Cronbach alpha 0.8 for basic research and Cronbach alphas 0.9 for research on very critical issues. In this study, internal consistency method is more suitable and is used to assess the reliability of the survey instrument.

Tables 3.6 show the summary of the reliability analysis for OSHAP constructs, OHSAS 18001 Efforts constructs, and OSHAPM measurements. In summary, the reliability analysis of pilot data indicated that all the constructs have

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alpha (α) value more than 0.7 (range of alpha value between 0.700 to 0.896). Thus, it can be concluded that on overall, the survey instrument is sufficient as reliable measure because it has high internal consistency. Moreover, as there were no reports of confusion about the questionnaire, the questionnaire was not modified.

Table 3.6

Pilot Results of Internal Consistency Analysis for OSHAP Constructs, OHSAS 18001 Construct, and OSHAPM Measures

Constructs/measures	No. of items	Alpha (α) values	Item for deletion	Alpha (α) if item is deleted
OSHAP:				
Safety Culture	6	0.862	None	0.862
Employee Attitude	6	0.735	AT5	0.810
Employee Involvement	5	0.755	EI4	0.789
Leadership Style	6	0.736	LD1	0.773
Effective Communication	6	0.732	EC1	0.824
Safety and Health Training	6	0.794	TR5	0.840
OHSAS 18001 Efforts:				
OH&S Policy	6	0.896	PC4	0.909
Planning	5	0.700	PL4	0.756
Implementation and Operation	6	0.769	IO1	0.790
Checking and Correction Action	6	0.718	CC6	0.789
Management Review	6	0.808	MR6	0.832
Continual Improvement	6	0.886	CI4	0.889
OSHAPM:				
Safety Performance	5	0.705	SP1	0.711
Financial Performance	5	0.711	FP3	0.742

3.4.4 Population and Sampling of a Study

Population selection in each study is essential for determining the direction of research. The automotive industry is seen an industry that is very concerned with quality initiative and performance measurement in their operations (Zakuan, 2009). This industry being the main industry in the scope of the industry management development creates many practices theories in their management (Chin and Saman, 2004). The population of the study is Proton and Perodua automotive suppliers. In

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this study, the respondents are the manager from company of the Proton and Perodua automotive suppliers. Selection of the respondents should have knowledge and experience in the field being studied by researchers.

The selection of Malaysian automotive suppliers selected by data contained in Proton Vendors Association (PVA) and Perodua Vendors Club (KVP) in order to achieve the research objective. These lists of automotive suppliers consist of metal, plastic, rubber, electrical, electronic and other automotive part. The identification of sample was started with determining the sampling population. Every item that reviewed need to be answered properly by the respondent. Then, the respondents were drawn from a list of sample (Johnson, 2011). In addition, sufficient data is required so that important differences or relationships can be observed by using SEM methods.

In relation to that, planning for sample size is essential for empirical studies. The sample size required to provide unbiased parameter estimates and accurate model fit information for SEM models depends on model characteristics, such as model size as well as score characteristics of measured variables, such as score scale and distribution (Lei and Wu, 2007). According to Gefen, Straub, Boudreau (2000), SEM requires large sample sizes due to the large number of estimations that take place as an example. Lei and Wu (2007) also stated that the larger models require larger samples to provide stable parameter estimates. Thus, empirical studies require having enough data so that important differences or relationships can be observed.

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The sampling plan started with the compilation of the greatest available database obtained from Proton Vendor Association (PVA) and Kelab Vendor Perodua (KVP) website when the target respondent has been decided. Direct hyperlink to companies' website can be obtained from association website. Information of company such as, classification of company, mailing address, email address, office and fax number collected.

The top management of the company is personnel involved in the survey. Respondents' titles (e.g. Managing Director/CEO, QC/QA Manager, and Manufacturing/Production Manager) were selected so that questionnaires could be mailed to the person who is most likely to have understanding, knowledgeable, practical experience about OSHAP and OHSAS 18001 Efforts and performance of the companies. In further, inclusion of some title (e.g. head of section) ensured that some typical small companies were included in the target sample. Table 3.7 shows a summary of the research sampling based on empirical study by (Habidin, 2012).

Table 3.7

Summary of the Research Sampling

	Malaysian Automotive suppliers		Total Vendors				
	Proton[1]	Perodua[2]	TVPP[3]	TVSB[4]	TVAMSB[5]	STP[6]	TVAMSTP[7]
Total Vendor	132	74	206	38	168		161
Electric	15	6	21	2	19		19
Electronic	6	6	12	2	10	7	6
Metal	47	25	72	14	58		58
Plastic	19	14	33	7	26		26
Rubber	15	10	25	6	19		19
Others	30	13	43	7	36		33

[1]Based on Proton Vendor Association (PVA)
[2] Based on Kelab Vendor Perodua (KVP)
[3]TVPP: Total vendor Proton and Perodua
[4]TVSB: Total vendors supply both in Proton and Perodua
[5]TVAMSB: Total vendor after deducting supply both to Proton and Perodua

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[6]STP: Total Vendor Supply two part to Proton or/and Perodua
[7]TVAMSTP: Total vendor after deducting vendor supply two parts to Proton and Perodua

The survey was conducted by distributed questionnaire to 161 companies with each company was given 1 to 5 sets of questionnaire by the company size. 1 to 3 returned questionnaires only. There are 400 sets of questionnaire was distributed to Proton and Perodua automotive suppliers. The respondents are the manager from company of the Proton and Perodua automotive suppliers. The unit of analysis for this study is company. Finally, the number of collected respondents was 278 respondents. Every respondent was given a week to answer the question. After that, the questionnaire was collected by researcher to evaluate the data. The author believes that it is crucial to find out the perception of critical factors from those who have understanding and practical experience in actual industrial environment.

Since, the questions in this questionnaire are in the form of perception, it is important to get various perceptions of managers on OSHAP and OHSAS 18001 Efforts execution from the view of plant operation, quality management, strategic management, and organizational performance.

3.4.5 Data Collection

The questionnaire is used to collect all the data in this research. The questionnaire was administered simultaneously in each PROTON and PERODUA vendor by researcher. The questionnaire was mailed to the Executive Manager, Director of Operations/Manufacturing or the person with the equivalent position in the

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organization. The Executive Manager, Director of Operations/Manufacturing is the best suited to self-report the decisions made regarding the manufacturing practice such as OSHAP and the results of the quality program implement.

3.4.6 Reliability

The reliability refers to the stability and consistency of the results derived from research to the probability that the same results could be obtained if the measures used in the research were simulated. Basically, Hurum (2005) in a study stated that reliability is concerned with the consistency, accuracy, and predictability of specific research findings. Reliability is a general term denoting consistency of measurements derived from repeated observations of the same subject under the same circumstances. Besides that, reliability is the extent to which a measurement of a single variable or sets of variable are consistent with what they are intended to measure (Khan and Adil, 2013). Therefore, the test on reliability of measurement is very important as a prerequisite to determine the stability and consistency (Sekaran, 2003) and allow a high degree of correlation among items that comprise the measure (Zakuan, 2009).

There are various methods for measuring aspects of reliability namely as test-retest reliability, parallel form or alternative form reliability, split half reliability, and Cronbach's coefficient alpha (Sekaran, 2003). Study by Lee and Yom (2013), internal consistency method is recommended by most researchers.

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Reliability test is the most frequently used in empirical studies for assessing the internal consistency and it is verified by using Cronbach's Alpa Coefficient (Sijtsma, 2009). Cronbach's Alpha was used to assess reliability for each construct (OSHAP, OHSAS 18001 Efforts, and OSHAPM) to measure the internal consistency and indicate how different items can reliably measure the construct in this research. These alpha value ranges from 0 to 1, where means higher value indicates higher levels of internal consistency. The recommended Cronbach's Alpha value and internal consistency used in this study was shown in Table 3.8.

Table 3.8

Cronbach's Alpha Rule of Thumb

Cronbach's Alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Acceptable
$0.6 \leq \alpha < 0.7$	Questionable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

3.4.7 Validity

Validity is concerned with whether the findings are really about what they appear to be about. Measure of instrument not only should be reliable, but it also must be valid. Another aspect of ascertaining the soundness of the instrument is validity testing. Validity refers to the extent to which the level of instrument should be measured (Ary, Jacobs and Razavieh, 2002; Sekaran, 2003). Internal validity can be conceptualized as to the degree to which we can trust the results (Cook and Beckman, 2006). In addition,

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mentioned by Bhattcherjee (2012) three commonly used tests for a researcher to test the validity. These include construct validity, internal validity, and external validity.

In this study, validation of the instrument was concluded in the in to two validity which are content validity and construct validity. The first validation was done through literature review on the concept of OSHAP, OHSAS 18001 Efforts, and OSHAPM that are related to the nature of the quality improvement in Malaysia automotive suppliers. A construct is considered to have content validity if the constructs contain measurement items that cover all important aspects of the constructs being measured (Cooper and Shindler, 2001). The content validity establishes the representative sampling of a whole set of items that measures a concept, and reveal how well the dimension and elements of the concept have been marked (Sekaran, 2003).

Thus, content validity is typically established based on the exhaustive and comprehensive literature review that has been completed. This validation was done through literature review on the concept of OSHAP, OHSAS 18001 Efforts, and OSHAPM in Malaysian automotive industry. Moreover, in order to check or measure the validity, the construct should have measurement items that are reviewed by experts which is academicians or professionals on the relevancy and adequacy of the construct (Zikmund, 2003; Hair, Black, Babin, Anderson, & Tatham, 2006; Halim & Ha, 2009).

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Content validity was also applied for the construct in which the items were reviewed by involving four academicians, and one industry experts having experience and knowledge in OSHAP and performance improvement in automotive industry for this study. Comments and feedback on the contents and the wording of the question, some changes and deletion of survey items were made before the questionnaires were distributed. In relation to that, content validity has been proved through expert validation as explained in previous sections.

According to Bindah and Othman (2013), construct validity for this study was evaluated by analyzing its convergent and discriminant validity, using factor analysis. Convergent validity was evaluated by checking the loading of each observed indicators on their underlying latent construct. High correlation indicates that the scale is measuring the intended concept. In addition, discriminant validity measures are checking whether the constituent items estimate only the specific construct. Meanwhile, discriminant factor analysis is then conducted to ensure that there is no cross loading between dimensions within the same construct (Mulyanegara & Tsarenko, 2009).

In additional effort with this line, the Exploratory Factor Analysis (EFA) was used to identify tentative items, as well as to suggest items for deletion and places where item should be added. Conducting EFA on a single summated scale indicated whether all items within the summated scale load on the same construct or whether the summated scale actually measures more than one construct. EFA was conducted on OSHAP constructs, OSHAPM measures, and OHSAS 18001 Efforts for this study

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According Huynh and Thi (2014), convergent validity was tested in which for each construct, item loading higher than 0.4 was accepted at this stage.

The second way in factor analysis was the confirmation on developed factors or constructs. In this study, the Confirmatory Factor Analysis (CFA) was conducted based on a step which is multiple factor first order confirmatory. CFA is the most comprehensive method to test and examine how good the data set fit the measurement structure. The next stage in the analysis was to test the measurement model, in which the OSHAP constructs, OHSAS 18001 Efforts, OSHAPM measure were tested based on first order confirmatory (multiple factor).

3.4.8 Statistical Analysis

The survey instrument was analyzed using two packages statistical software. Firstly, the Statistical Package for Social Sciences (SPSS) for window Version 20.0 was used to perform the required statistical analysis of the data from surveys. Secondly, the SEM Version 20.0 was used. Analysis of Moment Structure (AMOS) Version 20.0 has been selected to perform the SEM analysis in this study. Accordingly, these procedures are implemented based on a structured framework through six stages in SEM as recommended by the Zakuan (2009) and Habidin (2012) in the following:

i. Develop a theoretically based model,

ii. Construct a structural model,

iii. Choose the input matrix type,

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iv. Assess the identification of the model,

v. Evaluate model estimates and Goodness-of Fit, and

vi. Model interpretation and modification.

Three phases of analyses were conducted in this study which are Phase 1: general descriptive analysis, Phase 2: test of validity and reliability and Phase 3: test of hypotheses. Figure 3.2 shows the steps taken for the analysis in this study.

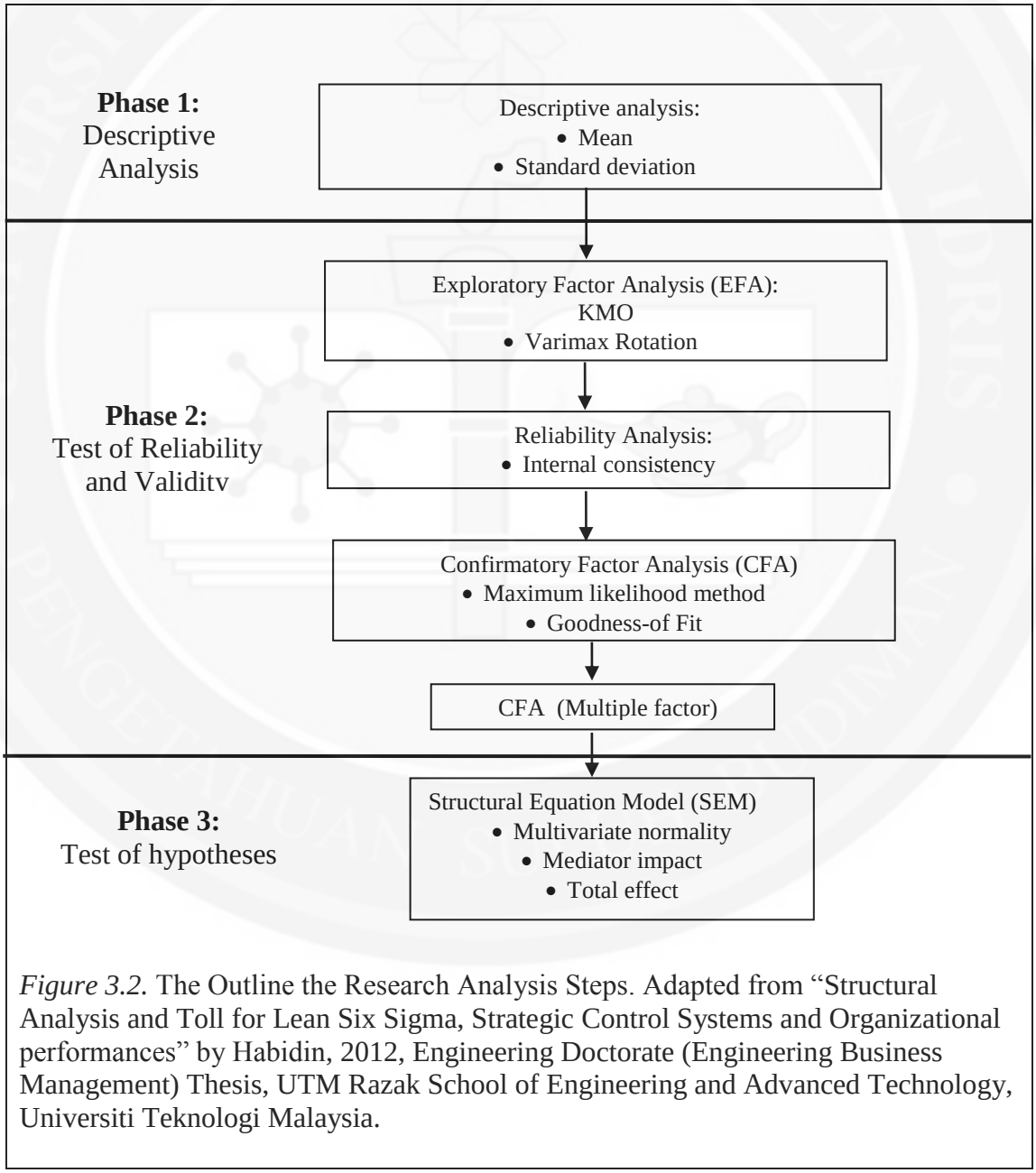


Figure 3.2. The Outline the Research Analysis Steps. Adapted from "Structural Analysis and Toll for Lean Six Sigma, Strategic Control Systems and Organizational performances" by Habidin, 2012, Engineering Doctorate (Engineering Business Management) Thesis, UTM Razak School of Engineering and Advanced Technology, Universiti Teknologi Malaysia.

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3.5 A Review on Structural Equation Modeling (SEM)

SEM is derived from multivariate techniques, which objectives are to expand the researcher's explanatory ability and statistical efficiency. According to Malakmohammadi (2011), SEM is a method similar to multiple regressions, but may be used as a more powerful alternative to multiple regression, path analysis, factor analysis, time series analysis, and analysis of covariance. SEM is a multivariate statistical approach that allows researchers to concurrently examine both the measurement and structural components of a model by testing the relationships "among multiple independent and dependent constructs" (Holbert and Stephenson, 2002).

Multivariate techniques have an important restriction in common, namely that these techniques are only able to examine one single relationship between the dependent and independent variables at a time. It means that the researcher is often incapable of analyzing a theory, where all possible information is considered. SEM differs from these other multivariate data analysis techniques, in the sense that it can examine a series of dependence relationships simultaneously (Overby & Suvanujasiri, 2012). SEM shows similarities to multiple regressions, and the relationships for each endogenous construct can be written in a form similar to a regression equation. The main difference lies in the ability for a construct to act as the independent variable in one relationship and the dependent variable in another relationship in a SEM.

Other than that, multivariate technique as defined by Burnette and Williams (2005) and Kong (2010) is a technique that combines aspects of factor analysis and multiple regressions that permit researchers to examine a series of interrelated

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dependence relationship among the measured variables and latent constructs as well as between several latent construct simultaneously. As continuity to it, the latent construct cannot be measured directly (Kong, 2010). However to ensure that latent variable can be measured by other indicator, this latent concept requires development of a latent variable model expressed in terms of observed variable (Beran & Violato, 2012). Next, latent constructs measurement is used to analyze and link set of hypotheses (Haenlein & Kaplan, 2004; Rungie, Coote, & Louvie, 2012).

Furthermore, SEM examines the structure of interrelationships through a number of equations. These equations depict the relationships among the dependent and independent variables, named the constructs, which are the unobserved or latent variables represented by multiple indicators. The SEM consists of two components: the inner model, which shows the linear relationships among the exogenous and endogenous latent variables, and the outer model, which relates each latent variable to its corresponding manifest indicators (Hair et al., 2006).

SEM was selected as the analytical tool to measure the effect of safety dimensions on safety performance and financial performance. There are several specific advantages of SEM that led the researcher to select this method as the preferred method of analysis. First of all, assumptions underlying the statistical analyses are clear and testable, giving the investigator full control and potentially furthering understanding of the analyses, use of CFA to reduce measurement error by having multiple indicators per latent variable, graphical interface software boosts creativity and facilitates rapid model debugging. In addition, SEM programs provide overall tests of model fit and individual parameter estimate tests simultaneously and

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SEM models can be used to purge errors, making estimated relationships among latent variables less contaminated by measurement error (Farooqui, 2011).

Furthermore, the rationale for the measurement model portion of SEM is similar to both exploratory (EFA) and confirmatory (CFA) factor analysis procedures. EFA procedures attempt to statistically reduce the original set of variables into smaller number or subset of variable that provide the most meaningful factor solution corresponding to underlying latent variables based on loading values. CFA tests to model assumptions to the empirical data (Brits, Meiring, & Becker, 2013).

Recently, there is an increasing growth in research conducted in the areas of quality initiatives that preferred using SEM techniques for data analysis, such as those that link quality practices and performance (Zakuan, 2009; Fullerton & Wempe, 2009). In addition, study by Handley and Benton (2009) there are the lists of recommended value of the measures of model suitability showed in Table 3.9.

Table 3.9

The Measures of Model Suitability

Goodness of Fit Measures	Recommended Value
Chi-square over degrees of freedom (X^2/df)	Between 1.0 to 3.0
Goodness of Fit Index (GFI)	≥ 0.9
Adjusted Goodness of Fit Index (AGFI)	≥ 0.9
Comparative Fit Indexes (CFI)	≥ 0.9
Tucker Lewis Index (TLI)	≥ 0.9
Root Mean Square Error Approximation (RMSEA)	≤ 0.08

Nilsson, Johnson and Gustafsson (2001) employed the SEM approach to examine the differences in customer satisfaction between product and service organizations have focused on how customers evaluate performance. This research

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inside organizations to analyze and investigate how key internal quality practices of product versus service organizations (employee management, process orientation, and customer orientation) influence customer satisfaction and business results as shown in Figure 3.3. The empirical data was gathered from 482 companies in Sweden and analysis shows that for product organizations, internal quality practices influence customer satisfaction and business results primarily through an organization's customer orientation.

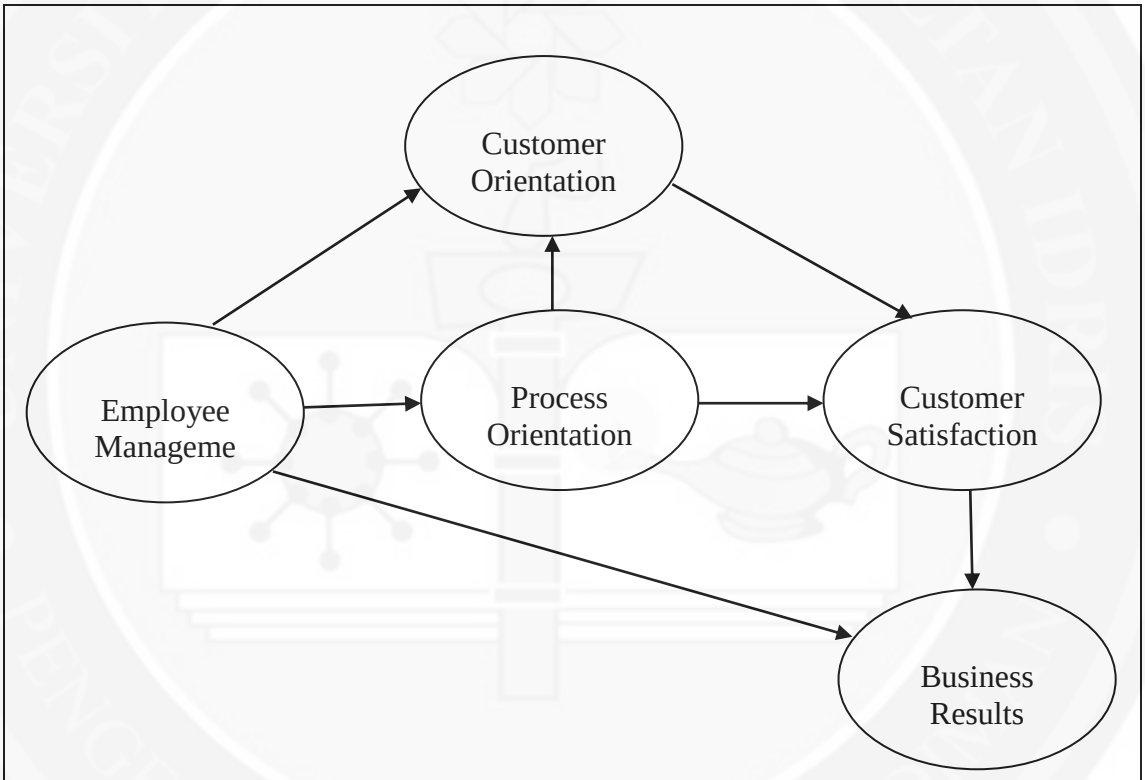


Figure 3.3. A Framework for Linking Quality Practices to Performance. Adapted from "The impact of quality practices on customer satisfaction and business results: product versus service organizations" by Nilsson, Johnson and Gustafsson, 2001, Journal of Quality Management, 6, 5–27.

Another previous study by Yule, Flin and Murdy (2007) investigated between management commitment and worker risk-taking. Workforce perception of safety climate (n=1026) were collected using SEM. The tested model revealed that the

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relationship between management commitment and supervisor involvement with risk-taking behavior was mediated by knowledge and training. Manager may find the model useful when attempting to improve safety climate. Figure 3.4 show the theoretical model of safety climate.

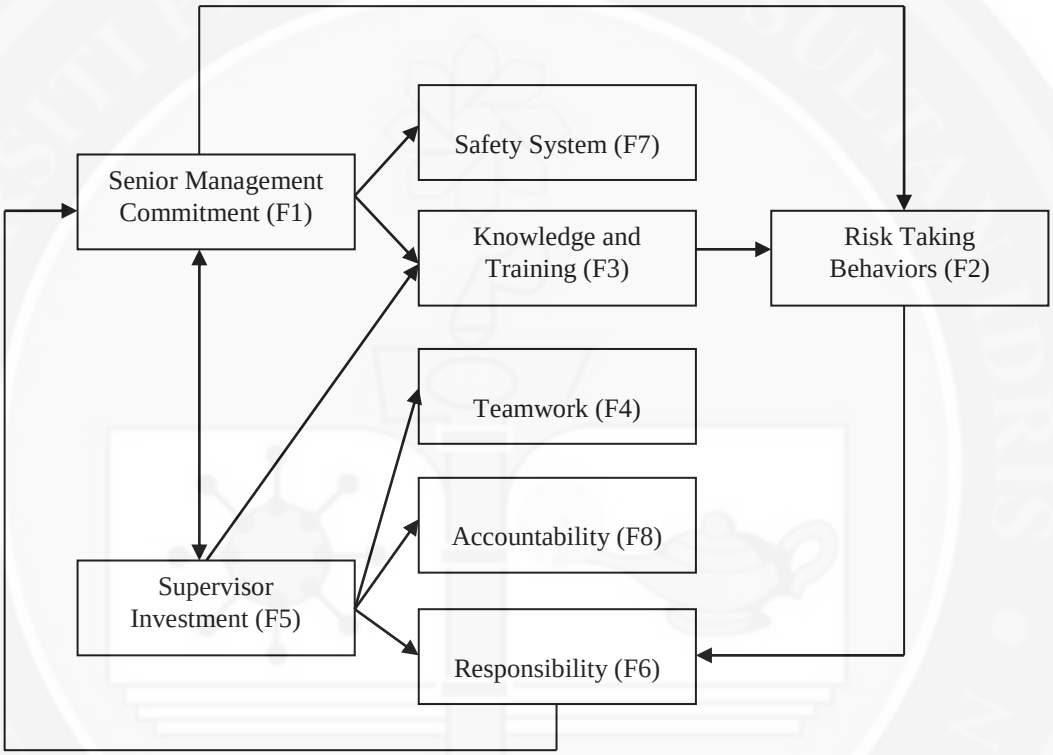


Figure 3.4. Theoretical Model of Safety Climate. Adapted from "The role of management and safety climate in preventing risk-taking at work" by Yule, Flin and Murdy, 2007, International Journal of Risk Assessment and Management, 7(2), 137-151.

In addition, latest practical by Lin, Chow, Madu, Kuei and Yu (2005) showed the model in Figure 3.5 investigated the factors that influence supply chain quality management. This study also used SEM to analyze the data. The data collected from Taiwan and Hong Kong. The result shows that Quality Management (QM) practices

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are significantly correlated with the supplier participation strategy and this influence tangibles business result, and customer satisfaction level. The data also showed that QM practices are significantly correlated with the supplier selection strategy.

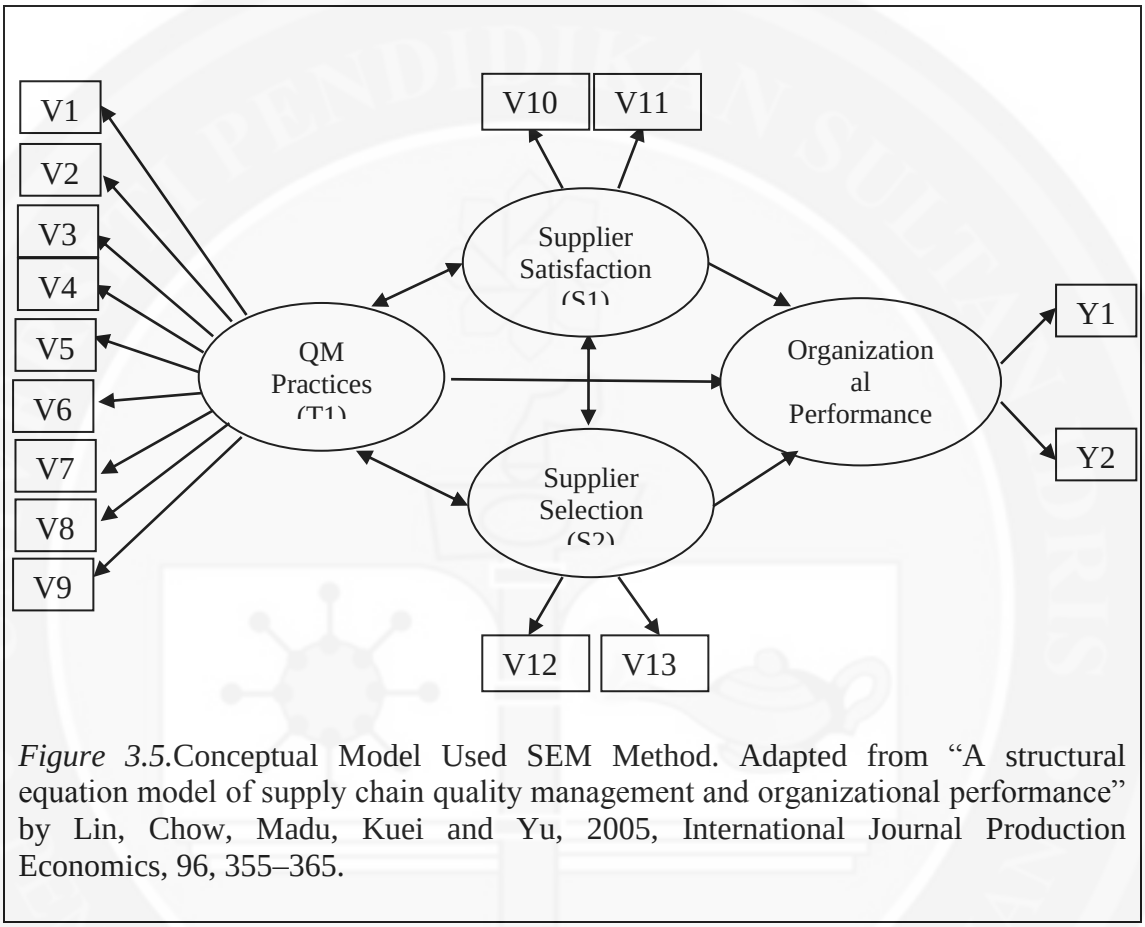


*Figure 3.5.*Conceptual Model Used SEM Method. Adapted from "A structural equation model of supply chain quality management and organizational performance" by Lin, Chow, Madu, Kuei and Yu, 2005, International Journal Production Economics, 96, 355–365.

*Note;- Top management leadership (V1), Training (V2), Product/service design (V3), Supplier quality management (V4), Process management (V5), Quality data reporting (V6), Employee relations (V7), Customer relations (V8), Benchmarking, Supplier participation —product design(V10), Supplier participation—Kaizen projects/workshops (V11), Supplier Quality-oriented Suppliers Selection (V12), Cost-oriented supplier selection (V13), Satisfaction level (Y1) and Business results (Y2)

3.6 Research Model

Usually, a theory represents causal processes that trigger observations on different variables. There has been an increasing trend on the use of SEM in business and

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technology including quality initiatives due to the fact that these confirmatory methods offer researcher a comprehensive method of assessing and altering theoretical models (Nilsson, Johnson and Gustafsson, 2001). This method is found to be better compared to other multivariate techniques such as multiple regression, path analysis and factor analysis. SEM is a tool that has the ability to simultaneously examine series of dependence and interdependence relationship.

3.6.1 A Proposed Research Model

Analyzing the impact of OHSAS 18001 Efforts as a mediating of the relationship between OSHAP and OSHAPM for Malaysian automotive industries is the aims of this research model. This model is called mediating model as presented in Figure 3.6.

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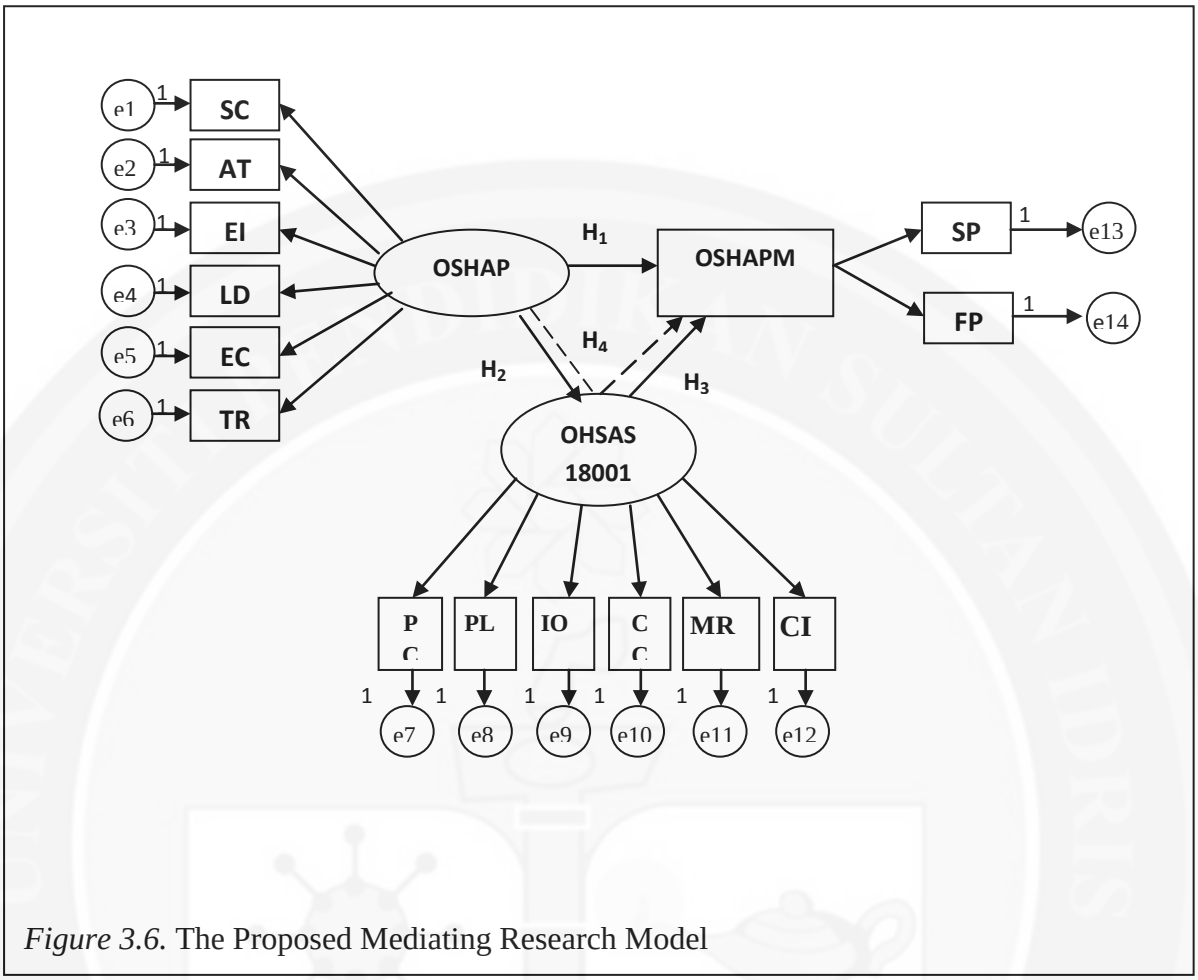


Figure 3.6. The Proposed Mediating Research Model

3.7 Summary

Chapter three has discussed in detail the research methodology employed encompassing data collection and analysis. Explanation on the process of data collection that started from the designing of the questionnaire modification and validation to the conduct of the mail survey approach was fully described. There is another important element in data collection which is the population and sampling method was also explained and it was carefully selected in order to achieve the objective of this study. Next, the data analysis part was thoroughly elaborated using

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SPSS software that was used to perform descriptive analyses, exploratory factor analyses, reliability analyses and regression analysis.

Besides that, SEM analysis was also employed to conduct CFA to study the relationship between OSHAP, OHSAS 18001 Efforts, and OSHAPM. This chapter also proposed a research model using the SEM technique. OHSAS 18001 Efforts construct be analyzed as whether they mediate the relationship between OSHAP and OSHAPM for mediator model. Besides that, four related hypotheses are developed and tested in Malaysian automotive suppliers. Finally in conclusion, the research methodology in this chapter has been critically developed to ensure rigorousness of the research process.

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CHAPTER 4

SURVEY ANALYSIS

4.1 Introduction

The results and analysis from the survey presented in this chapter. The chronologically, this chapter will commence with the introduction, general descriptive for respondents, followed by Exploratory Factor Analysis (EFA) to ensure that the instrument used in this study is valid and reliable. This is followed by reliability analysis (Cronbach's alpha), and finally, Confirmatory Factor Analysis (CFA) is presented as described in hypothesis test. Next, the results of the relationships between the implementation of OSHAP, OHSAS 18001 Efforts, and OSHAPM in Malaysian automotive suppliers, and also the mediator analysis are presented. Lastly, discussions of the overall survey result and final section is summarized this chapter.

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4.2 Demographic Profile of Respondents

The number of respondents is 278 from 400 sets of questionnaire that was distributed to the companies of PROTON and PERODUA. 278 sets of questionnaire were successfully collected that brought to 69.50% response rate. The general background of respondents, including the type of ownership, number of years in business, number of employees, and types of product, quality system certification, and position in the company was the first aspect investigated. From these, information on respondents' criteria can be identified as company classification and respondents background for Malaysian automotive suppliers.

The first question in this survey is the type of ownership. Majority of the respondents involved are fully owned by Malaysians (62.59%), followed by venture companies (26.98%) and the rest are owned by foreigners, 10.43%. Second, is the number of years in business, 17.63% of respondents have been in operation for less than 10 years and 21.94% of them have been involved in business for 10 to 20 years. 60.43% out of them have more than 20 years of experience in business as shown in Table 4.1. The earliest year in business for respondent was in 1950s.

Meanwhile, regarding the type of company ownership, respondents were also asked on the number of workers. Companies which have more than 300 employees were 46.76% from the overall total. This was followed by medium sized companies (44.24%). The small size companies (8.99%) have less than 50 full time workers. In short, majority of Small and Medium Enterprises (SME) from respondent company was mostly in medium size. SME represented 53.23% from the overall percentage of

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respondents that employ 1 to 300 of full time workers. In other words, majority of respondents were from SME.

With regard to respondents' designation, 40.29% of Malaysian respondents held senior management posts and 47.48% held middle management post as given in Table 4.1. As a reminder, the response received from this study, is reasonable because of high acceptance from top and middle management. This kind of collaboration contributes to the authenticity and validity of responses given and quality importance in an organization.

As can be seen, their distribution types of product is slightly different from the aspect that is based on metal, plastic, rubber, engine/transmission, electric/electronic, and others. According to the respondents, majority were metal companies with 42.45%. It is a representative of companies that manufacture automotive components.

Almost 75.90% were certified to ISO TS16949 and 50.00% were ISO 14001 certified as it is a major requirement for companies involved in the automotive industry. As many 27.70% were certified by ISO 9001:2008 and 27.34% were certified by OHSAS 18001. Then, for company have won quality award category, almost 46.04% companies did not have quality award. Only four companies got the Prime Minister's Quality Award which is 1.44%. Nevertheless, there is also where the company got more than one award such as State quality award with 7.91%) Industrial Excellence award with 20.50%) Quality Management Excellence Award with 17.63% and others with 20.52%

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Table 4.1

The Profile of the Respondent (n=278)

Constructs/measures	Frequency	Percent (%)
Types of ownership		
100% local	174	62.59
100% foreign	29	10.43
Joint venture	75	26.98
The number of year in business		
Less than 10 year	49	17.63
10 to 20 years	61	21.94
More than 20 years	168	60.43
Number of employee		
Less than 50	25	8.99
Between 50 to 150	59	21.22
Between 151 to 300	64	23.02
More than 300	130	46.76
Current position		
Senior management	112	40.29
Middle management	132	47.48
Others	34	12.23
Current position (years)		
Less than I year	41	14.75
1 to 3 years	52	18.71
3 to 6 years	71	25.54
More than 6 years	114	41.00
Types of product manufactured		
Metal	118	42.45
Plastic	76	27.34
Rubber	15	5.40
Engine/Transmission	27	9.71
Electric/Electronic	34	12.23
Others	79	28.42
Company certified to quality system standard2		
ISO 9001:2008	77	27.70
ISO TS 16949	211	75.90
ISO 14001	139	50.00
OHSAS 18001	76	27.34
None	10	3.60
Others	7	2.52
Company have won quality award		
Prime Minister's Quality Award	4	1.44
State quality award	22	7.91
Industrial Excellence award	57	20.50
Quality Management Excellence Award	49	17.63
None	128	46.04
Others	50	18.00

[1]Note: Some companies have more than one product type
[2]Note: Some companies have more than one certification
[3]Note: Some companies have won more than one quality award

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4.3 Exploratory Factor Analysis (EFA)

Factors analysis is the next step in the analysis. This section explains the results of Explanatory Factor Analysis (EFA). The EFA applied as the primary component analysis was used for extraction method. Varimax with Kaiser Normalization was adopted before factor rotation, and at once it preserved the factors with Eigen value of one or greater. This procedure was chosen to eliminate error variance as suggested by Yaacob, Rasli, Senin and Othman (2011). In this study, EFA was conducted in three separate variables. They are (i) perform EFA to determine the underlying details (items) of OSHAP constructs, (ii) perform EFA to identify the underlying details (item) of OHSAS 18001 Efforts constructs and (iii) perform EFA to define the underlying details (items) of OSHAPM measurement.

4.3.1 EFA on OSHAP Constructs

EFA with varimax rotation of 33 items of OSHAP was done on random sample (n=278) of Malaysian automotive suppliers to determine the basic details of each OSHAP construct namely: Safety Culture (SC), Employee Attitude (EA), Employee Involvement (EI), Leadership Style (LD), Safety and Health Training (TR) and also effective communication (EC). Kaiser-Meyer-Olkin (KMO) measurement showed the sampling adequacy as 0.931 which was more than 0.7 indicating that it was suitable for principal component analysis. Similarly, Bartlett's test of sphericity was significant at ($p < 0.001$), indicating sufficient correlation among items to proceed with analysis as shown in Table 4.2.

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Table 4.2

KMO and Bartlett's Test for OSHAP Constructs

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.931
Bartlett's Test of Sphericity	Approx. Chi-Square	3327.598
	df	528
	Sig.	.000

4.3.1.1 Initial Solution Results

According to Yusof (2010), initial solution results estimate variance in every variable caused by all components. Six factors in initial solution had larger Eigen values from unity as described in Table 4.3. This six factors contributed 52.738% from the total variance and sufficient for further analysis which requires at least 50% (Zakuan, 2009). Meanwhile, the last column (cumulative percentage) indicated that the variance explained by extraction solution was also 52.738%, similar to the initial solution. Therefore, there is no change explained by initial solution lost because of latent factors that reflects the method of production in OSHAP. Appendix D1 shows variance explained by initial solution for OSHAP construct.

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Table 4.3

Results of Total Variance Explained for OSHAP Items

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.328	31.298	31.298	10.328	31.298	31.298	4.245	12.865	12.865
2	2.114	6.405	37.703	2.114	6.405	37.703	3.703	11.222	24.087
3	1.504	4.557	42.260	1.504	4.557	42.260	3.128	9.478	33.565
4	1.240	3.759	46.019	1.240	3.759	46.019	2.415	7.317	40.882
5	1.155	3.500	49.519	1.155	3.500	49.519	2.134	6.468	47.349
6	1.062	3.220	52.738	1.062	3.220	52.738	1.778	5.389	52.738

4.3.1.2 Rotated Component Matrix Results

Discriminant validity is only shown if the item loading is high towards related factor when compared to other factors in EFA. According to Fullerton and Wempe (2009) and Namakula and Kituyi (2014), 0.4 loads for each item on respective factor are considered sufficient for the factor. However, a minimum of 0.5 fits cross-load items to various factors which are considered as sufficient (Ringim, 2013).

The rotated component matrix assists to determine what represent the component. Matrix assists the researcher to identify items that correlate the highest to one factor and on lowest remaining factor. In this study, six factors for OSHAP constructs (refer Appendix E1) were compared to the original construct from questionnaire. The first factor was made up of the five items from building SC including SC1, SC3, SC4, SC5 and SC6. One item was suggested to be removed (SC2).

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The second factor was classified as EA with six items (EA1, EA2, EA3, EA4, EA5 and EA6). No item was suggested to be removed. The third item was categorized as EI. This factor comprised of five items (EI1, EI2, EI3, EI4, and EI5). No item was suggested to be removed. The fourth factor consisted of six items from LD construct namely LD1, LD2, LD3, LD4, LD5 and LD6. No item was suggested to be omitted. The fifth factor was classified as EC with six items (EC1, EC2, EC3, EC4, EC5 and EC6). No item was suggested to be removed. The last factor consisted of five items which is TR namely TR1, TR2, TR3, TR4, and TR5. One item was suggested to be removed (TR6). The result of EFA exhibited for OSHAP constructs with 33 items.

4.3.2 EFA on OHSAS 18001 Efforts Construct

EFA with varimax rotation by 34 items from OHSAS 18001 Efforts was done on random sample (n = 278) of Malaysian automotive suppliers to produce basic details of each OHSAS 18001 Efforts namely: Occupational Health and Safety Policy (PC), Planning (PL), Implementation and Operation (IO), Checking and Correction Action (CC), Management Review (MR) and Continuous Improvement (CI). Kaiser-Meyer-Olkin (KMO) sampling adequacy measure was 0.924 which was greater than 0.7, signifying that the current data was suitable for principal component analysis. Similarly, the Bartlett's test of sphericity was significant ($p < 0.001$), indicating that correlation was adequate among the items to proceed for analysis as described in Table 4.4.

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Table 4.4

KMO and Bartlett's Test for OHSAS 18001 Efforts Constructs

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.924
Bartlett's Test of Sphericity	Approx. Chi-Square	3484.309
	df	561
	Sig.	.000

4.3.2.1 Initial Solution Results

Six factors in initial solution demonstrated Eigen value greater than unity as shown in Table 4.5. The six factors contributed 52.402% from the total variance. This indicated that the six latent factors were associated. The last column (cumulative percentage) signified that variance was described by factors taken as prior rotation. The cumulative variability explained by the six factors in extracted solution was also 52.402% similar to the initial solution. Detailed results showing the total variance explained by initial solution for OHSAS 18001 Efforts is given in Appendix D2.

Table 4.5

Results of Total Variance Explained for OHSAS 18001 Item

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.525	30.956	30.956	10.525	30.956	30.956	3.552	10.446	10.446
2	2.308	6.788	37.744	2.308	6.788	37.744	3.156	9.283	19.729
3	1.439	4.232	41.976	1.439	4.232	41.976	3.134	9.218	28.946
4	1.419	4.174	46.150	1.419	4.174	46.150	2.866	8.429	37.375
5	1.099	3.233	49.383	1.099	3.233	49.383	2.836	8.342	45.718
6	1.026	3.019	52.402	1.026	3.019	52.402	2.273	6.684	52.402

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4.3.2.2 Rotated Component Matrix Results

Relating to the building of OHSAS 18001 Efforts, 34 items was fit in six factors as recommended. A varimax rotation was also done. The PC, PL, IO, CC, MR and CI item was incorporated into the expected structuring as originally designed (detail in Appendix E2). The load factor was higher than 0.4 to the factors of its own. The first factor was made up of the six items from building PC including PC1, PC2, PC3, PC4, PC5, and PC6. The next factor was classified as PL with five items namely PL1, PL2, PL3, PL4, and PL5. The third factor consisted of IO namely IO1, IO2, IO3, IO4, IO5, and IO6. There were no items suggested to be removed. The fourth factor was classified as CC with five items namely CC1, CC3, CC4, CC5, and CC6. One item was suggested to be deleted (CC2). The fifth item was categorized as MR. This factor comprised of six items (MR1, MR2, MR3, MR4, MR5, and MR6). Finally, the sixth factor was grouped as CI and consisted of six items namely CI1, CI2, CI3, CI4, CI5, and CI6. No item was suggested to be removed.

4.3.3 EFA on OSHAPM

EFA with varimax rotation from 9 items of OSHAPM measures was done on random sample (n=278) of Malaysian automotive suppliers to produce basic details on each OSHAPM. They were Financial Performance (FP) and Safety Performance (SP). Sampling adequacy measure of Kaiser-Meyer-Olkin (KMO) was 0.855, which was greater than 0.7, thus indicating that the present data was suitable for principal component analysis. Similarly, Bartlett's test of sphericity was significant ($p < 0.001$),

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signaled that correlation was adequate among these items to proceed for analysis as shown in Table 4.6.

Table 4.6

KMO and Bartlett's Test for OSHAPM Measures

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.855
Bartlett's Test of Sphericity	Approx. Chi-Square	590.765
	df	36
	Sig.	.000

4.3.3.1 Initial Solution Results

Variance explained by initial solution for OSHAPM steps was determined. This is given in Appendix D3. Two factors in initial solution have Eigen values greater than unity as described in Table 4.7. Two factors taken into account were accounted 55.057% of the total variance. This indicated that the influence of two latent variables were associated. The last column (cumulative percentage) shows variance explained by factors taken before rotation. Cumulative variables explained by the two factors in extract solution also gave 55.057% which was similar to the initial solution. Hence, none of the variation explained by the initial solution was lost due to latent factors implying the suitability of method to extract the OSHAPM measures.

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Table 4.7

Results of Total Variance Explained for OSHAPM Items

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.811	31.232	31.232	2.811	31.232	31.232	2.792	31.019	31.019
2	2.144	23.826	55.057	2.144	23.826	55.057	2.163	24.038	55.057

4.3.3.2 Rotated Component Matrix Results

A varimax rotation also was carried out. This is given in Appendix E3. The first factor was classified as FP and consisted of five items (FP1, FP2, FP3, FP4, and FP5). No item was suggested to be removed. The second factor was classified as SP. This factor comprised of four items (SP1, SP2, SP3, and SP5) and one item was suggested for exclusion SP4.

4.4 Reliability Analysis

Reliability is the extent to which a measurement of a single variable or sets of variable are consistent with what they are intended to measure (Khan and Adil, 2013). Study by Yusoff (2012), the value of alpha was greater than 0.6 for all constructs indicating reliability Cronbach alpha values of the measured items were received. In this research, the latter method was adopted and internal consistency was conducted on 33 items to six OSHAP constructs, 34 items of OHSAS 18001 Efforts, and 9 items of

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OSHAPM effort by using SPSS reliability analysis procedure. Table 4.8 presents a summary of the analysis result. Detailed analysis of internal consistency to OSHAP, OHSAS 18001 Efforts, and OSHAPM construct is given in Appendix C1, C2, and C3.

Due to the fact that all constructs have the reliability (alpha value) greater than 0.7, thus it shows that all items from statistics construct are reliable and should not be dropped for further analysis, that is the inferential analysis.

Table 4.8

Results of Internal Consistency Analysis for OSHAP Constructs, OHSAS 18001 Efforts, and OSHAPM Measures

Constructs/measures	No. of items	Alpha (α) values	Item for deletion	Alpha (α) if item is deleted
OSHAP:				
Safety Culture	5	0.799	None	0.799
Employee Attitude	6	0.768	None	0.768
Employee Involvement	5	0.712	None	0.712
Leadership Style	6	0.809	None	0.809
Effective Communication	6	0.787	None	0.787
Safety and Health Training	5	0.704	None	0.704
OHSAS 18001 Efforts:				
OH&S Policy	6	0.820	None	0.820
Planning	5	0.723	None	0.723
Implementation and Operation	6	0.728	None	0.728
Checking and Correction Action	5	0.796	None	0.796
Management Review	6	0.788	None	0.788
Continual Improvement	6	0.769	None	0.769
OSHAPM:				
Financial Performance	5	0.724	None	0.724
Safety Performance	4	0.709	None	0.709

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4.5 Confirmatory Factor Analysis (CFA)

The subsequent level in analysis is to test the measurement model, whereby the OSHAP, OHSAS 18001 Efforts constructs, and OSHAPM measures, were tested by first order confirmatory – multiple factor. Basic model measurement test as a base for the full structural model fit (Weston and Gore Jr., 2006). If the measurement model is acceptable, then one can proceed for structural model testing. Authentication measurement model was conducted to evaluate the value of construct validity by using maximum probability method. CFA was based on comparison of variance-covariance matrix obtained from samples that were derived from the model.

The next analysis is called the First Order Confirmatory with multiple factors. It is also known as measurement model test, whereby OSHAP, OHSAS 18001 Efforts construct, and OSHAPM measures are tested using the first order confirmatory model and confirmed for evaluating construct validity by using the maximum likelihood method with multiple factors. A consistent result supports from the OSHAP construct with six factors, OHSAS 18001 Efforts construct with six factors and OSHAPM measures with two factors.

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4.5.1 OSHAP Constructs with Six Factors

The first tested model demonstrated that OSHAP construct consisted of SC, EA, EI, LD, EC and TR. OSHAP Model with six factors manifested an adequate fit outcome as shown in Figure 4.1. $\chi 2$ statistics was 648.304 (degree of freedom = 480, $p < 0.001$), with ratio of $\chi 2/df$ value being 1.351 less than 2.0 thus exhibiting a good fit. Goodness Fit Index (GFI) was 0.977 and Adjusted Goodness of Fit (AGFI) was 0.856 which was moderate fit. The comparative fit index (CFI) was 0.943, Tucker Lewis coefficient (TLI) was 0.937. The score was greater than 0.9 indicated as excellent fit. The value of (RMSEA) was 0.036 less than 0.08 and with that it displayed a good fit. All canonical correlation (rc) showed values of less than 1.0 signaling that discriminant validity was tested and acceptable.

At factor loading, the standard coefficient estimated at 0.49 (EC2) and 0.73 (SC3) was good as the accepted level of 0.3 with p-value <0.001 as presented in Figure 4.1 and Table 4.9. With that, it is suggested that these six constructs as applicable for measuring the OSHAP implementation.

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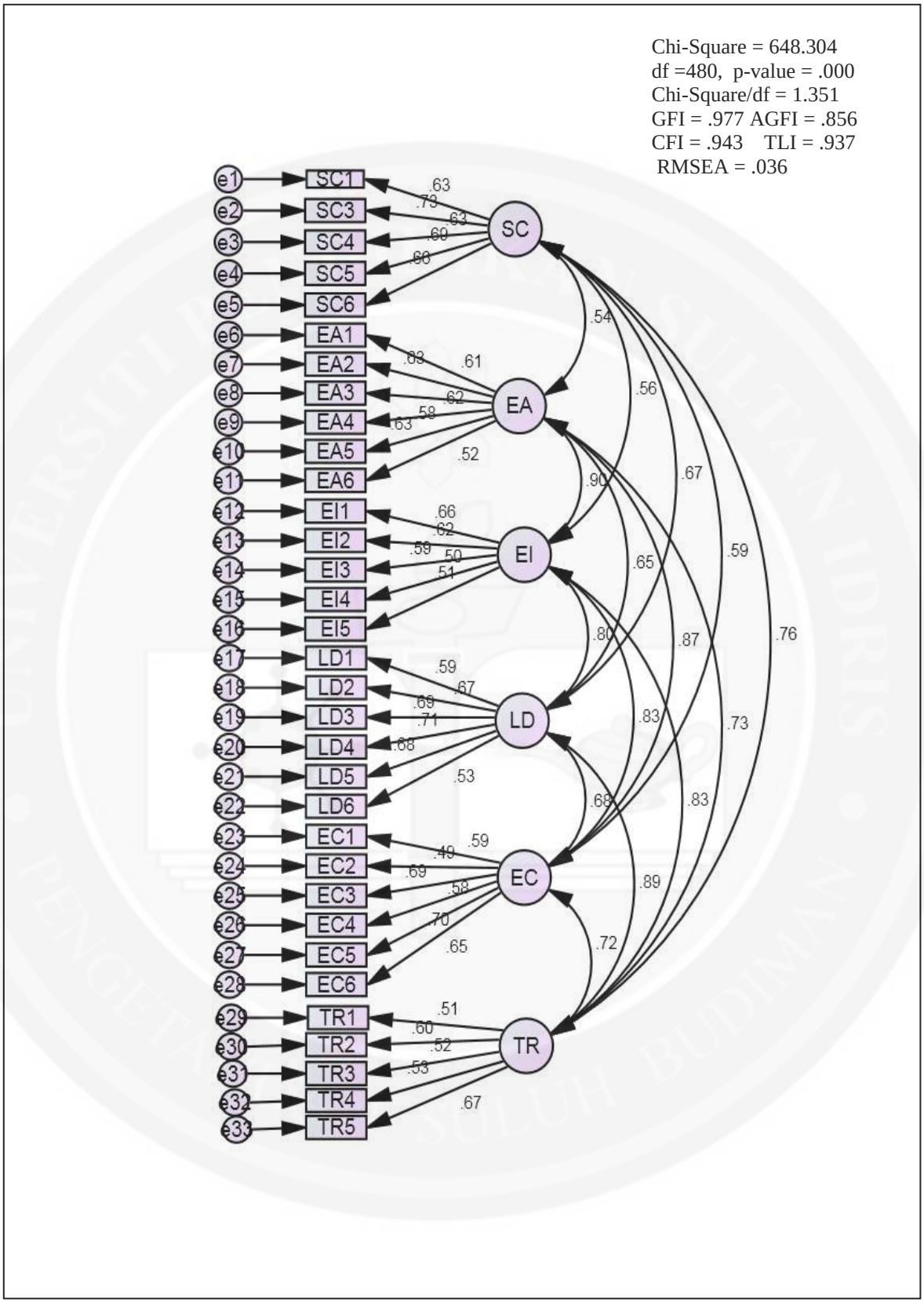


Figure 4.1. The Path Diagram for OSHAP Model

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Table 4.9

Regression Weights of OSHAP Constructs

			Estimate	S.E.	P	Label
SC6	<---	SC	1.000	.660		
SC5	<---	SC	1.070	.688	***	par_1
SC4	<---	SC	.790	.631	***	par_2
SC3	<---	SC	1.148	.733	***	par_3
SC1	<---	SC	.881	.630	***	par_4
EI5	<---	EI	1.000	.514		
EI4	<---	EI	.907	.498	***	par_5
EI3	<---	EI	1.119	.585	***	par_6
EI2	<---	EI	1.200	.625	***	par_7
EI1	<---	EI	1.287	.656	***	par_8
EA6	<---	EA	1.000	.520		
EA5	<---	EA	1.359	.626	***	par_9
EA4	<---	EA	1.227	.582	***	par_10
EA3	<---	EA	1.175	.617	***	par_11
EA2	<---	EA	1.448	.629	***	par_12
EA1	<---	EA	1.376	.613	***	par_13
EC6	<---	EC	1.000	.653		
EC5	<---	EC	.838	.696	***	par_14
EC4	<---	EC	1.041	.580	***	par_15
EC3	<---	EC	1.145	.685	***	par_16
EC2	<---	EC	.649	.494	***	par_17
EC1	<---	EC	.929	.590	***	par_18
LD6	<---	LD	1.000	.535		
LD5	<---	LD	1.476	.680	***	par_19
LD4	<---	LD	1.456	.707	***	par_20
LD3	<---	LD	1.461	.686	***	par_21
LD2	<---	LD	1.477	.665	***	par_22
LD1	<---	LD	1.167	.590	***	par_23
TR5	<---	TR	1.000	.670		
TR4	<---	TR	.697	.530	***	par_24
TR3	<---	TR	.704	.524	***	par_25
TR2	<---	TR	.722	.603	***	par_26
TR1	<---	TR	.707	.512	***	par_27

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4.5.2 OHSAS 18001 Efforts Construct with Six Factors

The two level of confirmation, the first order of confirmatory factor with multiple factors was tested and exhibited that OHSAS 18001 Efforts was the six constructs structure consisted of PC, PL, IO, CC, MR and CI.

The diagram was presented in Figure 4.2. CFA result showed a good fit. $\chi 2$ statistics was 713.250 (degree of freedom = 512, $p < 0.001$), with $\chi 2/df$ ratio of 1.393, a value that was less than 3.0 proved an excellent fit. The Goodness of Fit (GFI) was 0.968 and Adjusted Good of Fit (AGFI) was 0.846. The Comparative Fit Index (CFI) was 0.935. Tucker Lewis Coefficient Index (TLI) was 0.928. This score was close to 1.0 indicating an almost perfect fit. The next statistic set focusing on the root mean square error of approximation (RMSEA) was 0.038 which was less than 0.08, symbolized a good fit. Canonical correlations, rc was giving the values at less than 1.0, showed that discriminant validity was acceptable.

With regards to factor loading, the standardized coefficient, the recorded value between 0.49 (MR2) and 0.72 (CC3) was good because it transcended the acceptable value of 0.3 with p-value < 0.001 as shown in Table 4.10. Thus, it confirms that six factors are able to measure OHSAS 18001 Efforts.

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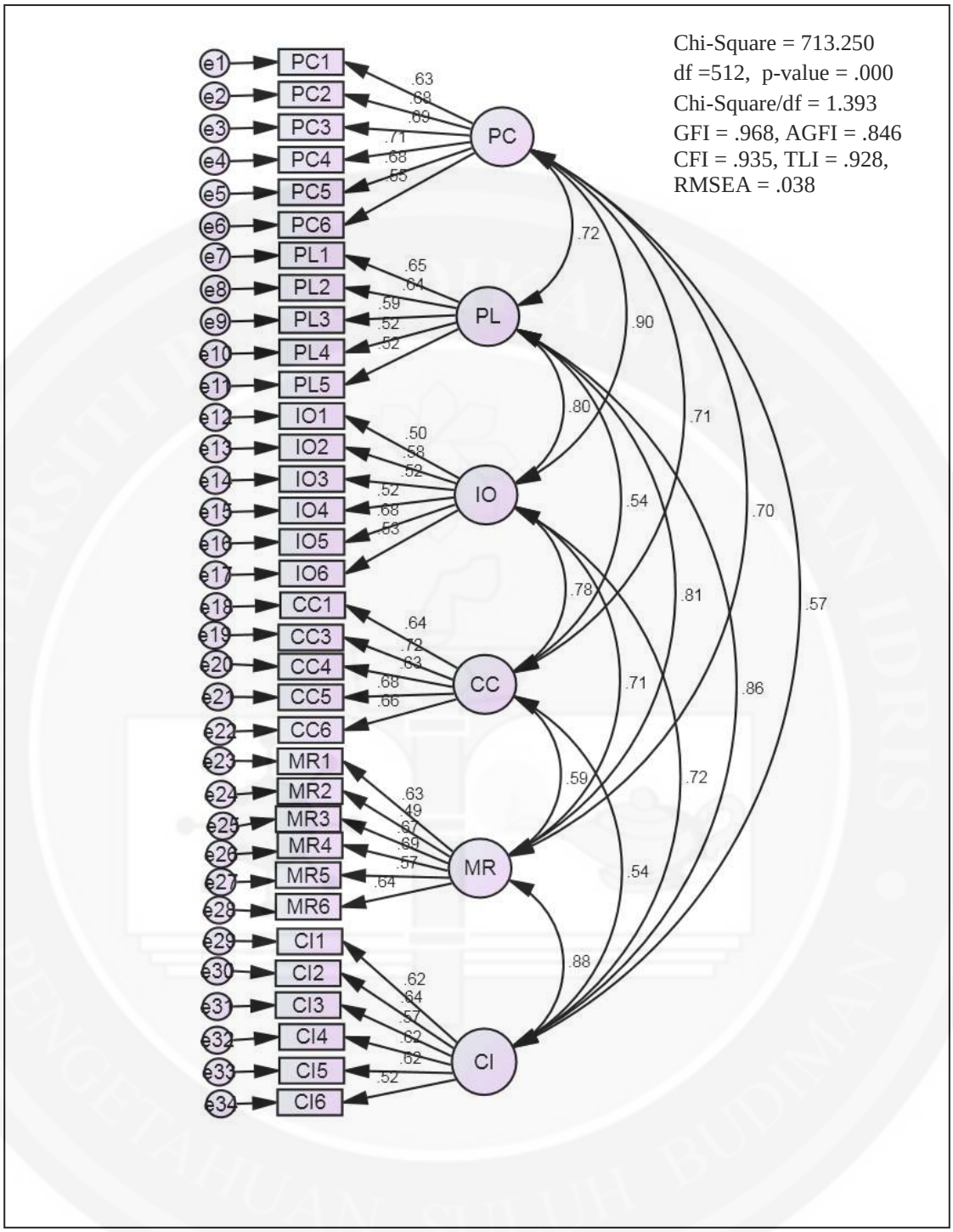


Figure 4.2. The Path Diagram for OHSAS 18001 Efforts Model

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Table 4.10

Regression Weights of OHSAS 18001 Efforts Constructs

			Estimate	S.E.	P	Label
PC6	<---	PC	1.000	.550		
PC5	<---	PC	1.389	.679	***	par_1
PC4	<---	PC	1.394	.712	***	par_2
PC3	<---	PC	1.402	.689	***	par_3
PC2	<---	PC	1.455	.681	***	par_4
PC1	<---	PC	1.221	.634	***	par_5
PL5	<---	PL	1.000	.517		
PL4	<---	PL	.962	.516	***	par_6
PL3	<---	PL	1.153	.593	***	par_7
PL2	<---	PL	1.254	.638	***	par_8
PL1	<---	PL	1.277	.648	***	par_9
IO6	<---	IO	1.000	.533		
IO5	<---	IO	1.436	.683	***	par_10
IO4	<---	IO	.969	.522	***	par_11
IO3	<---	IO	.986	.520	***	par_12
IO2	<---	IO	.984	.583	***	par_13
IO1	<---	IO	.974	.500	***	par_14
MR6	<---	MR	1.000	.643		
MR5	<---	MR	.846	.573	***	par_15
MR4	<---	MR	1.052	.693	***	par_16
MR3	<---	MR	1.067	.667	***	par_17
MR2	<---	MR	.659	.494	***	par_18
MR1	<---	MR	.997	.626	***	par_19
CC6	<---	CC	1.000	.660		
CC5	<---	CC	1.059	.681	***	par_20
CC4	<---	CC	.784	.627	***	par_21
CC3	<---	CC	1.128	.720	***	par_22
CC1	<---	CC	.891	.637	***	par_23
CI6	<---	CI	1.000	.516		
CI5	<---	CI	1.358	.620	***	par_24
CI4	<---	CI	1.246	.621	***	par_25
CI3	<---	CI	1.166	.573	***	par_26
CI2	<---	CI	1.497	.640	***	par_27
CI1	<---	CI	1.405	.621	***	par_28

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4.5.3 OSHAPM Measures with Two Factors

The third confirmation level with First Order Confirmatory with Multiple Factors tested was OSHAPM with two steps comprised of FP and SP. The diagram is presented in Figure 4.3. The CFA result demonstrated a good fit. Statistics of $\chi 2$ was 49.437 (degree of freedom = 26, $p < 0.001$), with ratio of $\chi 2/df$ was 1.901 which was less than 3.0 exhibiting a good fit. The Goodness of Fit (GFI) was 0.961 and Adjusted Good Fit (AGFI) was 0.933. The Comparative Fit Index (CFI) was 0.958, Tucker Lewis coefficient (TLI) was 0.942. The score was very close to 1.0 signifying perfect fit. Root mean square error of approximation (RMSEA) was 0.057 and less than 0.08 and reflected good fit. Canonical correlation (rc) indicated a value of less 1.0, implying that discriminant validity was acceptable.

Regarding the factor loading, the standardized coefficient was between 0.54 (SP5) and 0.74 (SP1) which was beyond the acceptable limit of 0.3 with p value < 0.001 as described in Table 4.11. Therefore, it confirms the ability of the two factors to measure the OSHAPM.

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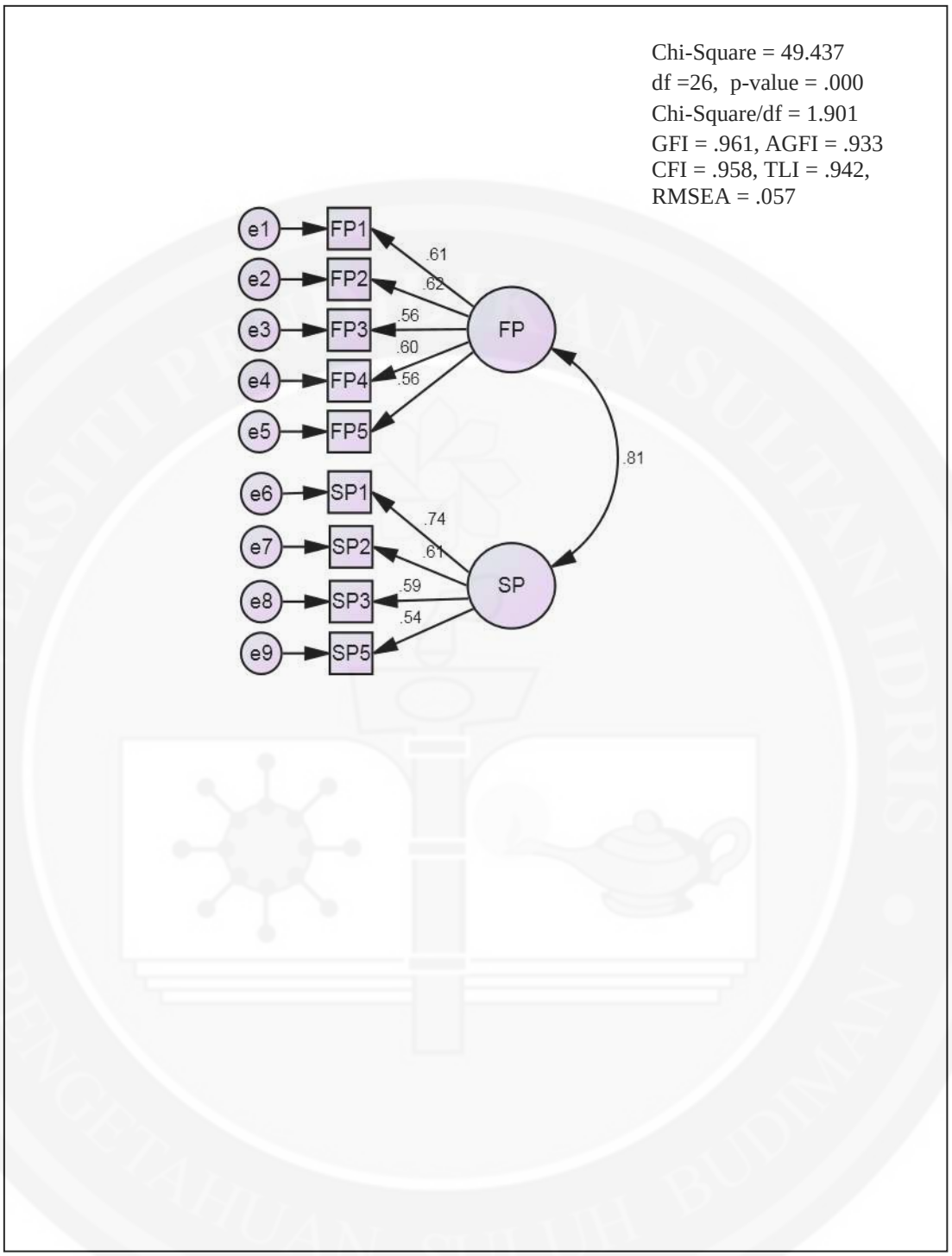


Figure 4.3. The Path Diagram for OSHAPM Model

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Table 4.11

Regression Weights of OSHAPM Measures

			Estimate	S.E.	P	Label
FP5	<---	FP	1.000	.555		
FP4	<---	FP	1.091	.603	***	par_1
FP3	<---	FP	.894	.564	***	par_2
FP2	<---	FP	.894	.622	***	par_3
FP1	<---	FP	1.205	.614	***	par_4
SP5	<---	SP	1.000	.544		
SP3	<---	SP	.866	.588	***	par_5
SP2	<---	SP	1.051	.606	***	par_6
SP1	<---	SP	1.224	.739	***	par_7

4.6 Test of Hypotheses

After achieving a satisfying decision, and based on a reliable and valid instrument, specific hypothesis of this research was tested. Analysis of research hypotheses was conducted as follows:

H_1: There is a positive relationship and a strong direct relationship between OSHAP and OSHAPM.

H_2: There is a positive relationship and a strong direct relationship between OSHAP and OHSAS 18001 Efforts.

H_3: There is a positive relationship and a strong direct relationship between OHSAS 18001 Efforts and OSHAPM.

H_4: OHSAS 18001 Efforts mediates the relationship between OSHAP and OSHAPM.

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Before conducting the structure analysis by using SEM technique, it was required that the variables of overall test satisfy the assumption of normality. The skewness value, was less than 1.0, therefore the symmetry of the individual values can be estimated. Moreover, the value of kurtosis was close to 0. Skewness and kurtosis were referred as shown in Table 4.12.

Table 4.12

Assessment of Multivariate Normality

	Skewness	Kurtosis
OSHAP Practices	-0.457	-0.864
OHSAS 18001	-0.402	-0.692
OSHAPM	-0.793	-.0.127

4.7 Mediating Effect of OHSAS 18001 Efforts in Malaysian Automotive Suppliers

The final analysis is to look at any mediating effect of OHSAS 18001 Efforts. Figure 4.4 indicates the weight of both internal and external regression for structural relationship between OSHAP, OHSAS 18001 Efforts and OSHAPM, based on structural model for Malaysian automotive suppliers (n = 278). The goodness-of-fit indices for structural model ($\chi 2/df=2.727$, GFI=0.911, AGFI=0.876, CFI=0.960, TLI=0.951, and RMSEA=0.079) was good within the general acceptable limit, exhibited a good fit data. The standardized regression weight and p-value for structural relationship is illustrated in Table 4.13.

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The standardized regression weight for H_1 was 0.592 and significant at p <0.001. This is supported to H_1 that OSHAP implementation has a direct and high relationship on OSHAPM in Malaysian automotive supplier industry. The standardized regression weight for H_2 was 0.609 and significant p <0.001, thus H_2 OSHAP gives a high positive impact to OHSAS 18001 efforts. Next, the standardized regression weight for H_3 of OHSAS 18001 efforts and OSHAPM was 0.150 and significant with p-value of 0.015 less than 0.05. The result support H_3 that OHSAS 18001 positive and direct significant relationship between OSHAPM.

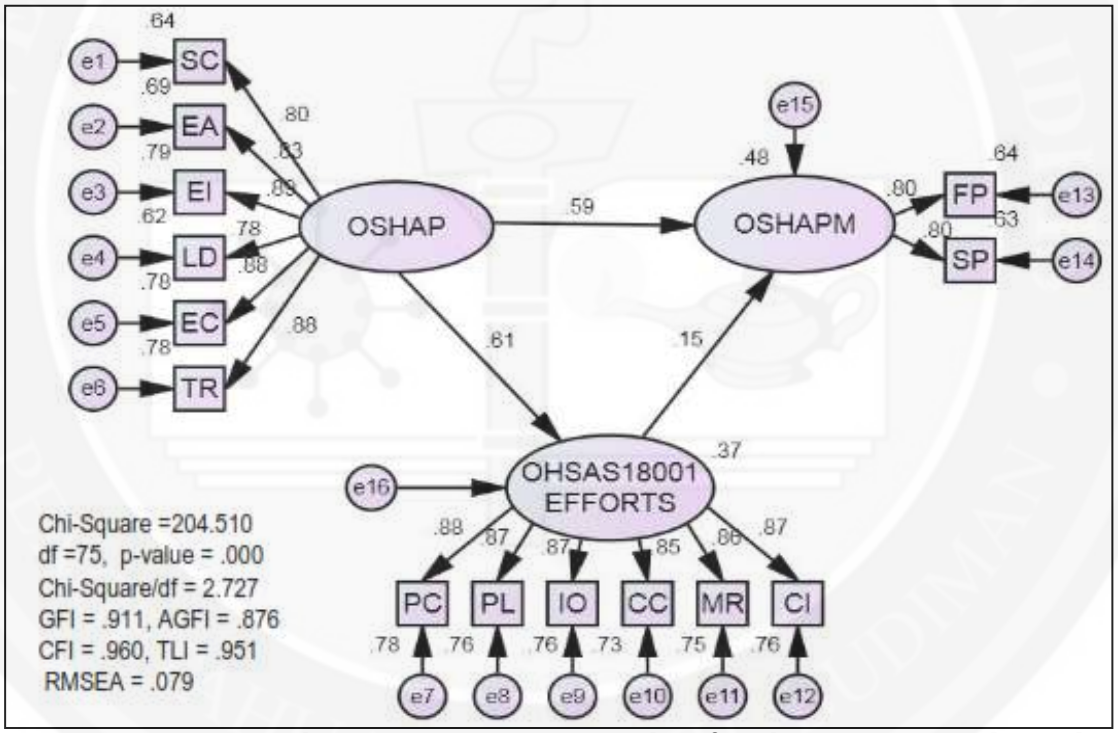


Figure 4.4. Inner and Outer Regression Weights for the Structure Relationship between OSHAP and OSHAPM with a Mediation of OHSAS 18001 Efforts in Malaysian Automotive Suppliers

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Table 4.13

Regression Weights of Path Model (OSHAP, OHSAS18001, and OSHAPM)

Standardized Regression Weights (Relationship)			Standardized Estimated	p-value
OHSAS18001_EFFORTS	<---	OSHAP	.609	***
OSHAPM	<---	OHSAS18001_EFFORTS	.150	.015
OSHAPM	<---	OSHAP	.592	***
TR	<---	OSHAP	.884	***
EC	<---	OSHAP	.881	***
LD	<---	OSHAP	.785	***
EI	<---	OSHAP	.890	***
EA	<---	OSHAP	.828	***
SC	<---	OSHAP	.798	***
CI	<---	OHSAS18001_EFFORTS	.870	***
MR	<---	OHSAS18001_EFFORTS	.863	***
CC	<---	OHSAS18001_EFFORTS	.853	***
IO	<---	OHSAS18001_EFFORTS	.872	***
PL	<---	OHSAS18001_EFFORTS	.870	***
PC	<---	OHSAS18001_EFFORTS	.883	***
FP	<---	OSHAPM	.799	***
SP	<---	OSHAPM	.796	***

Organizational performance is also indirectly influenced by OSHAP through OHSAS 18001 Efforts. To test whether OHSAS 18001 Efforts is the key mediator for OSHAP with OSHAPM, the following rule of thumb was followed (Hair et al., 1998).

1. IE <0.015 => Non mediator
2. IE> 0.015 and IE ≈ DE => Partial Mediator (OSHAP-> OSHAPM relationship, p <0.05)
3. IE> 0.015 and IE>> DE => Total Mediator (OSHAP -> OSHAPM relationship, p> 0.05)

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Table 4.14

Direct Effect (DE) and Indirect Effect (IE) Analysis in Malaysian Automotive Suppliers

Factors	Std. Total Effect			Std. Direct Effect			Std. Indirect Effect		
	OSHAP	OHSAS 18001	OSH APM	OSHAP	OHSAS 18001	OSHAPM	OS HA P	OHSAS 18001	OSHA PM
OHSAS 18001	0.609	0.000	0.000	0.609	0.000	0.000	0.0 00	0.000	0.000
OSHAP M	0.683	0.150	0.000	0.592	0.150	0.000	0.0 91	0.000	0.000

*Note: Std=Standard, Total Effect=Direct Effect+Indirect Effect

Table 4.14 revealed that standard Indirect Effect (IE) from OSHAP for OSHAPM was 0.091 which is greater than 0.015. Thus, OHSAS 18001 Efforts mediates the relationship between OSHAP and OSHAPM. Since p-value for Direct Effect (DE) between OSHAP and OSHAPM is less than 0.05, therefore, OHSAS 18001 Efforts are a partial mediator. As a conclusion, this finding supports hypothesis H_4 whereby the OHSAS 18001 Efforts mediates the relationship between OSHAP and OSHAPM in Malaysian automotive supplier.

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4.8 Summary

The research outcome and related analysis was presented in this chapter. The analysis starts with research respondent's profile, a detailed presentation of EFA analysis, reliability and CFA analysis. Demographic data of respondents from Malaysia automotive suppliers is summarized. Test of reliability and validity are among the different factors presented and instrument used in this research are found to be valid and reliable. Next, by taking into account the structural analysis, this study has used the SEM to investigate the effect of mediator of OHSAS 18001 Efforts between OSHAP implementation and OSHAPM.

The association and relationship between these factors are generally positive and significant. The implementation of OSHAP gives direct effect towards OSHAPM and also indirect effect towards OSHAPM through OHSAS 18001 Efforts. This proves that OHSAS 18001 Efforts plays important role as a mediating variable between OSHAP implementation and OSHAPM in Malaysian automotive suppliers. Lastly, with hope this research would be benefit to automobile manufacturer and automotive supplier in their effort to become much more efficient and competitive, to enhance the organization ability in the future.

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CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Introduction

The discussion and conclusion of the research is presented in this chapter. The discussions presented the results of OSHAP, OHSAS 18001 Efforts, and OSHAPM measurement model and continue with conclusion. The presentation of conclusion divided into five main parts. It starts with the contribution of the research, both from academic and practical point of view. The second part provided dissemination of knowledge of the research outputs particularly with respect to all the publications that were able to be produced throughout the period of this research. The third part consists of description of research objectives achievement and to be followed by the limitation of the research and recommendation for future research that could be undertaken. Finally, the chapter culminates with an overall conclusion for this research.

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5.2 Discussions

5.2.1 Results of OSHAP, OHSAS 18001 Efforts, and OSHAPM Measurement Model

This section begins with a summary of the results from the preceding sections and comprehensively evaluates the reliability and validity of the EFA measurement scale, test reliability and CFA. Steps and results for each analysis can be referred in the Table 5.1. As a conclusion, the Cronbach alpha showed a strong reliability for each instrument. The result of EFA and CFA indicated that items and constructs in this study exhibited both convergent and discriminant validity.

Table 5.1

Summary of EFA, Reliability, and CFA Results

Analysis	Before Analysis			After Analysis			Remark
	OSHAP	OHSAS 18001 Efforts	OSHAPM	OSHAP	OHSAS 18001 Efforts	OSHAPM	
EFA	6 factors 35 items	6 factors 35 items	2 factors 10 items	6 factors 33 items	6 factors 34 items	2 factors 9 items	2 items (SC2, TR6) of OSHAP; 1 item (CC2) of OHSAS 18001; and 1 item (SP4) of OSHAPM has been eliminated
Reliability	-	-	-	> 0.7	> 0.7	> 0.7	Acceptable
CFA multiple factor	6 factors 33 items	6 factors 34 items	2 factors 9 items	6 factors 33 items	6 factors 34 items	2 factors 9 items	Acceptable

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Meanwhile, the measurement model was evaluated in this study to ensure the validity of latent variables in OSHAP constructs, OHSAS 18001 Efforts constructs, and OSHAPM measurement. By using the AMOS 20.0 software to test this model, it was found that there were a few valuable findings that can be mentioned.

Through the measurement model of OSHAP constructs, six factors of model analysis as measurement model for OSHAP constructs demonstrated good fit and proved that this model is valid and reliable for Malaysian automotive suppliers. Then for OHSAS 18001 Efforts, all observed variables were significant at $p < 0.001$ and this signifies that latent variables of OHSAS 18001 Efforts are valid and reliable. Lastly, for OSHAPM measurement, the results of the test were similar to the original model which proved that OSHAPM model has two factors. Table 5.2 exhibits that the model has good fit. All observed variables were significant at $p < 0.001$. The results of the study indicate that latent variables of OSHAPM are valid and reliable.

Table 5.2

Summarizes of Results CFA Multiple Factor for OSHAP, OHSAS 18001 Efforts, and OSHAPM

Latent	$\chi 2$/df	P-value	GOF (GFI & AGFI)	GOF (CFI & TLI)	RMSEA	Remark
OSHAP	< 3	< 0.01	> 0.8	> 0.9	< 0.08	Acceptable
OHSAS 18001 Efforts	< 3	< 0.01	> 0.8	>0.9	< 0.08	Acceptable
OSHAPM	< 3	< 0.01	> 0.9	> 0.9	< 0.08	Acceptable

Besides that, result of the study proved that OSHAP, OHSAS 18001 Efforts, and OSHAPM were latent exogenous variable. OSHAP is represented by six observed endogenous variables which are SC, EA, EI, LD, EC, and TR. While OHSAS 18001

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Efforts is represented by six observed endogenous variables comprises of PC, PL, IO, CC, MR, and CI. Finally, OSHAPM is represented by two observed endogenous variables namely FP and SP.

Table 5.3 exhibits that all factors of endogenous variable of OSHAP, OHSAS 18001 Efforts, and OSHAPM had the correlation value that was closely related to the value of canonical correlation (rc) of less than 1.0 which means discriminant validity was accepted. It was also found that error associated with every observed endogenous variable of OSHAP, OHSAS 18001 Efforts, and OSHAPM were uncorrelated.

Table 5.3

Summary of Results on Measurement Model of OSHAP, OHSAS 18001 Efforts, and OSHAPM

Latent exogenous variable	Observed endogenous variables	Canonical correlation (r_c) value	Errors associated (endogenous variable)
OSHAP	6 factors: SC, EA, EI, LD, EC, and TR	6 factor correlated (rc < 1= DV acceptable)	Uncorrelated
OHSAS 18001 Efforts	6 factors: PC, PL, IO, CC, MR, and CI	6 factor correlated (rc < 1= DV acceptable)	Uncorrelated
OSHAPM	2 factors: FP and SP	2 factor correlated (rc < 1= DV acceptable)	uncorrelated

*Noted: r_c= canonical correlation, DV=discriminant validity

The structural relationship in structure model was adopted to test the hypothesis of mediating effect in this study. As discussed earlier, this structure model is valid for Malaysian automotive suppliers. Relationship between OSHAP and OSHAPM for Malaysian automotive suppliers was found positive and significant,

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which confirmed that OSHAP implementation gave strong positive direct impact towards OSHAPM. This result was supporting with the previous research (Mckone et al. 2001; Ahuja and Khamba, 2007).

In relation to that, the standardized regression weight for direct relationship between OHSAS 18001 Efforts and OSHAPM was found positive yet insignificant. It was surprising that OHSAS 18001 Efforts did not give strong and direct impact on OSHAPM. This may be OHSAS 18001 Efforts need another practice to support this strategy to be more effective and excellent which is OSHAP. However, this finding is different because it discovered a significant direct relationship between OHSAS 18001 Efforts and OSHAPM. In the meantime, the finding of the fourth hypothesis demonstrated that OSHAPM could give indirect effect on OSHAP implementation through OHSAS 18001 Efforts and the value of this indirect effect was 0.091.

The result proved that OHSAS 18001 Efforts partially mediated the relationship between OSHAP and OSHAPM with p value for DE was less than 0.05. This evidenced proved that OSHAP should combine with OHSAS 18001 Efforts to ensure that OSHAPM can be upgraded. The impact of OSHAP implementation on performance increases with OHSAS 18001 as mediator in Malaysian automotive suppliers. As a conclusion, every company that involve in the Malaysian automotive supplier should implement OSHAP and have the OHSAS 18001 Effort to support OHSAPM.

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5.3 Research Contribution

This section describes several novel contributions produced from the work of this research. The contribution is not only limited for academic purposes but also for practitioners as well, especially the automotive industry in Malaysia. This contribution has also become the source of knowledge that is recognized through publications and award received. After undergoing all sorts of processes and procedures, it is believed that this study has successfully attained the four main objectives outlined in first chapter.

5.3.1 Academic and Practical Contributions

This study focuses on developing a structured relationship model between OSHAP, OHSAS 18001 Efforts, and OSHAPM based on strategic factors that have been set. It can increase the literacy and assists researchers in understanding these practices. Moreover, it also provides guidelines and references for research in the future. The key contributions of this research are six for OSHAP constructs, six for OHSAS 18001 Efforts constructs, and two for OSHAPM measures were developed and verified using the SEM technique.

After a valid instrument is developed, this research prepared a structured relationship model among OSHAP, OHSAS 18001 Efforts, and OSHAPM. This research model is a mediator model in which it investigates whether the presence of OHSAS 18001 Efforts mediates the relationship between OSHAP and OSHAPM. The result of analysis used SEM method shown that OHSAS 18001 Efforts does not affect

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the relationship between OSHAP and OSHAPM. However, OHSAS 18001 Efforts improved OSHAPM when coupled with OSHAP.

After going through rigorous process and procedures including conducting validity and reliability tests, only measures of significant items were maintained to create an instrument of latent constructs and measurement items. It then became a set of valid and reliable measurement instrument to assist academicians and practitioners to further increase their knowledge and comprehension of OSHAP initiatives implementation which can assist the automotive suppliers to improve OSHAPM. Continuous with empirical test results prove that the presence of OHSAS 18001 Efforts in the practice of OSHAP has improved the OSHAPM.

Finally, based on the developed models and tools the outcome of research is reliable, not only useful and acting as a guide for managers and practitioners of automotive suppliers to increase OSHAPM through the implementation of OSHAP and OHSAS 18001 Efforts.

5.3.2 Dissemination of Knowledge through Publications

Towards the end of this research, it has successfully contributed to 3 publications, 1 conference, and 1 award receptions at national and international levels, all these are listed in Appendix F, G, and H.

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5.4 Fulfillment of Research Objectives

Normally, the primary measure of success in every research is achieving the goals of objectives. This research has identified a comprehensive measurement instrument that covers the implementation of OSHAP, OHSAS 18001 Efforts, and OSHAPM for the Malaysian automotive industry. Researcher has identified six OSHAP constructs, six OHSAS 18001 Efforts constructs, and two measures for the OSHAPM. All these instruments can be expanded for future research. It also can be adapted to different countries and cultures.

After the instrument developed and validated by experts, this research prepared a structured relationship model among OSHAP, OHSAS 18001 Efforts, and OSHAPM. This model was developed to investigate whether the presence of OHSAS 18001 Efforts to assist OSHAP had a positive effect to OSHAPM. However, the implementation on OHSAS 18001 Efforts assists in improving performance when combined with OSHAP. The impact of OSHAP implementation on performance increases with OHSAS 18001 Efforts as mediator in Malaysian automotive suppliers. Thus, it is hope that this research of structural relationship model between OSHAP, OHSAS 18001 Efforts, and OSHAPM can assist Malaysian automotive suppliers in enhancing the understanding and implementation of the OSHAP, OHSAS 18001 Efforts, and the OSHAPM so that the process and management of operations become more effective and efficient.

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The implication of the study provides guidance on implementation and recommendations to the Malaysian automotive suppliers. Consequently, it allows management to use structural relationship model proposed by this study to develop and enhance the management of suppliers and increase OSHAPM. This is consistent with the government's intention to strengthen the management of world class quality operations and then return to lead the automotive industry in the ASEAN region. Government takes measures to ensure the country's automotive industry more competitive at inside and abroad.

5.5 Limitation of the Research

There are several limitations and weaknesses in this study. Among the inherent limitations are time constraints, financial resources, and relationships that are not widely available. Therefore, this study only focused on the Malaysian automotive industry. Besides, the data collection process is very tough process and gives a new experience to researchers. Various methods used in the process of collecting data such as through e-mail, mail and visiting factories. In order to that, some method that has been used in data collection involves the provision of substantial financial and time consuming.

Another limitation in this research is the number of factors and limited measurement in this study. Only a few factor OSHAP, OHSAS 18001 Efforts, OSHAPM measurements only considered. There are other factors that are appropriate in implementing OSHAP, OHSAS 18001 Efforts in the automotive suppliers.

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However, the view of OSHAP and OHSAS 18001 Efforts is still new in Malaysia and not fully implemented, this is because some factors are not suitable to be investigated for this study.

Further, researcher is very difficult to obtain the feedback from consultant in OSHAP and OHSAS 18001 Efforts to verify the instrument that has been used. However, this instrument has been validated by industry experts and academic experts who study this field. The instrument validation is important to ensure that the objectives of the study can be achieved.

However, all these limitations are not to remain as weaknesses to researcher. It could probably be benefited as this research has given space, opportunities, and recommendations for future researchers to subsequently explore this area in greater detail. It is hoped that this research will be benefit to researchers, academic, and practitioners in their pursuit of organizational excellence through OSHAP and OHSAS 18001 Efforts.

5.6 Recommendation for Future Research

Researcher suggested that future studies improve and increase the OSHAP and OHSAS 18001 Efforts through the combination of variables between quantitative and qualitative case study to obtain much better elements relevant for current scenario in the automotive industry. Include more than two manufacturing car such as NAZA and other than that. The risk management and sustainable element is very appropriate to

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combine with OSHAP and OHSAS 18001 Efforts and assist to increase any performance such as risk performance.

In this research also found there are still have more perspectives and recommendations for future research. In relation to that, future researchers could more consider specifically through the comparison of the implementation of structured relationship in terms of different aspects such as company ownership, company size, type of product, and management system certified to see whether this group has any impacts on OSHAPM. This comparison is hoped to show more interesting and provide a much more understanding of their relationship for future guidelines.

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APPENDIX A1

The Questionnaire Instruments



TITLE:
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION PACTICES, OHSAS 18001 EFFORTS AND PERFORMANCE FOR MALAYSIAN AUTOMOTIVE SUPPLIERS

Dear Prof./Dr./Mr./Ms./Sir/Madam**,**

You are invited to participate in a survey on the OSHAP, OHSAS 18001 efforts and OSHAPM in Malaysian automotive suppliers. The purpose of this study is to develop a conceptual model for OSHAP and OHSAS 18001 efforts and to analyze its impact on OSHAPM. The research results will facilitate the success of automotive organization by highlighting the relationship between OSHAP, OHSAS 18001 efforts and OSHAPM.

We would greatly appreciate your co-operation in filling out the enclosed questionnaire or giving it to your colleague who is responsible in this area in your organizations. The collected data will be kept strictly confidential, and will be used for academic purpose only.

Should you have any inquiries, please send an email to aunifatinnadia_89@yahoo.com

Thank you.

Yours Sincerely,

Auni Fatin Nadia Chiek Desa
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SURVEY ON OSHAP, OHSAS 18001 EFFORTS AND OSHAPM IN MALAYSIAN AUTOMOTIVE SUPPLIERS

INTRODUCTION:

This survey forms a part of the study on the implementation of OSHAP and OHSAS 18001 as a set of practices in automotive suppliers. The main objective of this survey is to determine the extent of OSHAP implementation in Malaysian automotive suppliers. The information gathered would be useful in devising suitable approaches that will be of benefits to car manufacturers and suppliers. All responses given will be treated with strictest confidentially. The results will be used only for research purposes and no attempt will be made to identify any individuals or organizations in any publications.

INSTRUCTIONS:

This questionnaire consists of five (3) main sections. Please read the questions carefully before answering them. Where appropriate, tick in the box or complete the answer in the space provided.

SECTION 1: GENERAL INFORMATION

This section seeks general information about your company. Where appropriate, please tick (/) or fill in the blank.

1.Date of establishment of your company? Year _____

2.What is the type of ownership for your company?

☐ 100% local ☐ 100% foreign ☐ Joint venture (_____ %:_____% foreign)

3.Which type/group of products do you supply? Please tick as many as apply.

☐ Metal Part ☐ Plastic parts ☐ Rubber parts

☐ Engine/Transmission part ☐ Electrical/Electronic ☐ Part Others _____

4.What is the approximate number of employees in your company?

☐ Less than 50 ☐ Between 50 to 150 ☐ Between 151 to 300 ☐ More than 300

5.Which of the following is the company certified to?

☐ ISO 9001:2008 ☐ ISO/TS16949 ☐ ISO 14001 ☐ OHSAS 18001

☐ None ☐ others (please specify)…….

6.What is your current position in your company?

☐ Senior management ☐ Middle Management ☐ Others (please specify)……

7.How long have you been in your current position

☐ Less than 1 year ☐ 1 to 3 years ☐ 3 to 6 years ☐ More than 6 years

8.Which of the following quality awards have your company won?

☐ Prime Minister's Quality award ☐ State Quality award ☐ Industry Excellence award

☐ Quality Management Excellence Award ☐ None ☐ Others (please specify)

……

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SECTION 2: PERCEPTION ON THE CRITICAL SUCCESS FACTOR OF OSHAP AND OHSAS 18001

In this section, we are trying to determine your perception on the succeeding factors OSHAP and OHSAS 18001 implementation.

Instruction:
Please respond to the following questions by circling one of the numbers [1] to [7] to the right of the question. Please use the following scales:

[7] Very High [6] High [5] Slightly High [4] Medium
[3] Slightly Low [2] Low [1] Very Low

A1. OSHAP							
Safety Culture							
1. Extent to which the employees understand the rules and systems for working safely	7	6	5	4	3	2	1
2. Extent to which the incidents and accidents are reported	7	6	5	4	3	2	1
3. Extent to which the whole organization seen as work together to create safety work environment	7	6	5	4	3	2	1
4. Extent to which the safety training provides a good knowledge	7	6	5	4	3	2	1
5. Extent to which the equipment and facilities you are maintained to ensure a safe operation	7	6	5	4	3	2	1
6. Extent to which the company seeks fast correction of problems found during safety inspections	7	6	5	4	3	2	1
Employee Attitude							
7. Extent to which the employees feel that management is fair and effective in their approach on safety	7	6	5	4	3	2	1
8. Extent to which the safety issue should be assigned to high priority in management meetings	7	6	5	4	3	2	1
9. Extent to which the complete responsibility for deciding how and when the work is to be done	7	6	5	4	3	2	1
10. Extent to which the freedom in deciding how the work is to be done	7	6	5	4	3	2	1
11. Extent to which the job gives me considerable freedom in doing the work	7	6	5	4	3	2	1
12. Extent to which the job allow me an opportunity to use discretion or participation in decision making	7	6	5	4	3	2	1
Employee Involvement							
13. Extent to which the employee is given the opportunity to make contribute idea in improving safety	7	6	5	4	3	2	1
14. Extent to which the training continue on the job with help to reinforce from experience workers	7	6	5	4	3	2	1
15. Extent to which the community being give a privilege to speak out for the employee	7	6	5	4	3	2	1
16. Extent to which the employees sincerely participate in identifying safety problems	7	6	5	4	3	2	1
17. Extent to which the employees involved with safety issues at work	7	6	5	4	3	2	1
Leadership							
18. Extent to which the plant management provide personal leadership for quality improvement	7	6	5	4	3	2	1
19. Extent to which all major department heads within our plant to encourage quality improvement	7	6	5	4	3	2	1
20. Extent to which the top management encourage employees' involvement in the production process	7	6	5	4	3	2	1
21. Extent to which the discusses in specific terms who is responsible for achieving performances targets	7	6	5	4	3	2	1
22. Extent to which the top management spends time teaching and coaching staff	7	6	5	4	3	2	1
23. Extent to which the top management keeps track of staff's mistakes	7	6	5	4	3	2	1
Effective Communication							
24. Extent to which the management operates an open door policy on safety issues	7	6	5	4	3	2	1
25. Extent to which the safety information is always brought to my attention by my line manager	7	6	5	4	3	2	1
26. Extent to which the manager and employees communicate freely in safety issue	7	6	5	4	3	2	1
27. Extent to which the worker and management meet together to formulate behavior oriented safety goals	7	6	5	4	3	2	1
28. Extent to which two ways safety communication is effective in the organization	7	6	5	4	3	2	1
29. Extent to which there is sufficient opportunity to discuss and deal with safety issues in meetings	7	6	5	4	3	2	1
Safety and Health Training							
30. Extent to which the employees feel that they receive adequate training in how to work safely	7	6	5	4	3	2	1

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31. Extent to which the employer and employee received safety and health training regularly	7	6	5	4	3	2	1
32. Extent to which the training tools and technique used for safety and health effectively	7	6	5	4	3	2	1
33. Extent to which the employee attend safety and health training before commencing the job	7	6	5	4	3	2	1
34. Extent to which the safety issues are given high priority in training programmes	7	6	5	4	3	2	1
35. Extent to which the management encourage the workers to attend safety training programmes	7	6	5	4	3	2	1

A2. OHSAS 18001 Efforts							
OH&S Policy							
1. Extent to which your company/division use these OH&S Policy?							
a. Compliance to legal requirements	7	6	5	4	3	2	1
b. OHS management as prime responsibility of line management	7	6	5	4	3	2	1
c. Understanding, implementation, and maintenance at all levels	7	6	5	4	3	2	1
d. Appropriate to the nature and scale of the organizations	7	6	5	4	3	2	1
e. Include a commitment to continual improvement	7	6	5	4	3	2	1
f. Documented, implemented and maintained	7	6	5	4	3	2	1
Planning							
2. Extent to which your company/division use these Planning tools?							
a. Company hazard identification	7	6	5	4	3	2	1
b. Risk assessment and control	7	6	5	4	3	2	1
c. Accordance with legal and other requirement	7	6	5	4	3	2	1
d. Implementation of occupational health and safety policies	7	6	5	4	3	2	1
e. Comprehensive hierarchy of plans to integrate and co-ordinate activities	7	6	5	4	3	2	1
Implementation and Operation							
3. Extent to which your company/division use these implementation and operation tools?							
a. Management Structure and responsibility	7	6	5	4	3	2	1
b. Training, awareness and competence	7	6	5	4	3	2	1
c. Consultation and communication	7	6	5	4	3	2	1
d. Management documentation	7	6	5	4	3	2	1
e. Management operational control	7	6	5	4	3	2	1
f. Management managed and maintained	7	6	5	4	3	2	1
Checking and Correction Action							
4. Extent to which your company/division use these checking and correction action tools?							
a. Monitoring	7	6	5	4	3	2	1
b. Management Corrective and preventive action	7	6	5	4	3	2	1
c. Quality information	7	6	5	4	3	2	1
d. Conforming planning arrangement	7	6	5	4	3	2	1
e. Management system audit	7	6	5	4	3	2	1
f. Complement judgment and recommendations	7	6	5	4	3	2	1
Management Review							
5. Extent to which your company/division use these management review tools?							
a. Results of audits	7	6	5	4	3	2	1
b. Employee feedback	7	6	5	4	3	2	1
c. Process performance	7	6	5	4	3	2	1
d. Status of preventive and corrective action	7	6	5	4	3	2	1
e. Follow-up action from previous management review	7	6	5	4	3	2	1
f. Recommendations for improvement	7	6	5	4	3	2	1
Continual Improvement							
6. Extent to which your company/division use these continual improvement tools?							
a. The actions on results from analysis of data	7	6	5	4	3	2	1
b. The achievement of objectives	7	6	5	4	3	2	1
c. Results from audits	7	6	5	4	3	2	1
d. Periodic review of controlled documents	7	6	5	4	3	2	1
e. Evaluation of suppliers	7	6	5	4	3	2	1
f. Quality improvement proposals	7	6	5	4	3	2	1

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SECTION 3: PERCEPTION ON PERFORMANCE MEASURES

In this section, we are trying to investigate your perception on the performance measures towards the implementation of OSHAP and OHSAS 18001.

Instruction:
Please respond to the following questions by circling one of the numbers [1] to [7] to the right of the question. Please use the following scales:

Scale:
[7] Strongly Agree [6] Agree [5] Somewhat Agree [4] Neither Agree nor Disagree
[3] Somewhat Disagree [2] Disagree [1] Strongly Disagree

B. OSHAPM	
Financial Performance	
1. Increased operating income	7 6 5 4 3 2 1
2. Increased sales growth	7 6 5 4 3 2 1
3. Increased in return on investment	7 6 5 4 3 2 1
4. Increased cash flow	7 6 5 4 3 2 1
5. Reduced costs	7 6 5 4 3 2 1
Safety Performance	
6. Improved Enhance the image of company	7 6 5 4 3 2 1
7. Improved employee absenteeism	7 6 5 4 3 2 1
8. Improved Employee's motivation	7 6 5 4 3 2 1
9. Reduced personal injuries	7 6 5 4 3 2 1
10. Reduced Material damage	7 6 5 4 3 2 1

Would your company be interested in participating in the next phase of the project, which entails a detailed case study?

☐ Yes ☐ No ☐ Would be considered

If yes, please attach your business card, for correspondence matters so that we may contact you.

THANK YOU FOR YOUR COOPERATION

PLEASE REPLY TO:

Auni Fatin Nadia Chiek Desa
Faculty of Management and Economics
Department of Accounting and Finance,
Universiti Pendidikan Sultan Idris
35900 Tanjong Malim, Perak
Malaysia.
H/P: +6017-5556256
Fax: +605-4594643
Email: aunifatinnadia_89@yahoo.com

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APPENDIX B1

An example letter to quality expert

TO WHOM IT MAY CONCERN

Dear Prof./Dr./Mr./Ms./Sir/Madam,

EXPERT EVALUATION OF QUESTIONNAIRES

As part of my master work, I am currently working on research which focuses on occupational safety and health administration (OSHA) practices and OHSAS 18001 efforts in Malaysian Automotive Suppliers. The objective of the study is to develop a model for such companies. For this purpose, I am at the stage of determining the critical success factors for OSHA implementation in this sector and have developed questionnaires.

Prior to conducting the full survey, I believe that it is important and necessary that the designed questionnaires meets its purpose and is easily understood. As an expert in Management Accounting/OSHA practices/OHSAS 18001 efforts, I would greatly appreciate your completion and comments upon it. Kindly attach your Curriculum Vitae (CV) as our reference, to complete the process of the data collection.

I would be grateful to receive of your respond before <Date> to enable me to progress to the next stage of the survey.

Thank you in advance for your time and participation.

Yours sincerely,
AUNI FATIN NADIA BINTI CHIEK DESA
Master of Accounting (Management Accounting),
Department of Accounting and Finance,
Faculty of Management and Economics,
Universiti Pendidikan Sultan Idris,
35900 Tanjung Malim, Perak, Malaysia.
Email: aunifatinnadia_89@yahoo.com

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APPENDIX B2

An example cover letter for pilot study

<Date>
<Title> <First Name> <Last Name>
<Job Title>
<Company Address>
<City> <Pos Code>
<Country>

Dear, <Title> <Last Name>,

Research on OSHAP implementation and OHSAS 18001 Efforts in Automotive Suppliers

As part of my master work, I am currently working on research which focuses on occupational safety and health administration (OSHA) practices and OHSAS 18001 efforts in Malaysian Automotive Suppliers. The objective of the study is to develop a model for such companies. For this purpose, I am at the stage of determining the critical success factors for OSHA implementation in this sector and have developed questionnaires.

Prior to conducting the full survey, I believe that it is important and necessary that the designed questionnaires meets its purpose and is easily understood. As an expert in Management Accounting/OSHA practices/OHSAS 18001 efforts, I would greatly appreciate your completion and comments upon it. Kindly attach your Curriculum Vitae (CV) as our reference, to complete the process of the data collection.

I would be grateful to receive of your respond before <Date> to enable me to progress to the next stage of the survey.

Thank you in advance for your time and participation.
Yours sincerely,

AUNI FATIN NADIA BINTI CHIEK DESA
Master of Accounting (Management Accounting),
Department of Accounting and Finance,
Faculty of Management and Economics,
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35900 Tanjung Malim, Perak, Malaysia.
Email: aunifatinnadia_89@yahoo.com

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APPENDIX B3

An example cover letter for final survey

<Date>

<Title> <First Name> <Last Name>,
<Job Title>
<Company Name>
<Company Address>
<City> <Pos Code>
<Country>

Dear, <Title> <Last Name>,

You are invited to participate in a survey on the Occupational Safety and Health Administration Practices (OSHAP) implementation and OHSAS 18001 efforts in the Malaysian Automotive Suppliers. The purpose of this study is to develop a conceptual model for OSHAP implementation and OHSAS 18001 efforts and to analyze its impact on occupational safety and health administration performance (OSHAPM). The research results will facilitate the success of automotive companies by highlighting the relationship between OSHAP, OHSAS 18001 Efforts and OSHAPM

We would greatly appreciate your co-operation in filling out the enclosed questionnaire and distributing another **two questionnaires** to your colleagues who hold responsibility in this area at your company. The collected data will be kept strictly confidential, and will be used for academic purpose only. Please return the completed questionnaire in the envelope provided.

Should you have any inquiries, please send an email to aunifatinnadia_89@yahoo.com

Thank you.

Yours Sincerely,

Auni Fatin Nadia Chiek Desa
Master of Accounting (Management Accounting),
Department of Accounting and Finance,
Faculty of Management and Economics,
Universiti Pendidikan Sultan Idris,
35900 Tanjung Malim, Perak, Malaysia.

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APPENDIX B4

An example follow-up letter for final survey

<Date>

<Title> <First Name> <Last Name>,
<Job Title>
<Company Name>
<Company Address>
<City> <Pos Code>
<Country>

Dear, <Title> <Last Name>,

Re: Survey on OSHAP, OHSAS 18001 Efforts and OSHAPM in Malaysian Automotive Suppliers

I am writing to remind you about the questionnaire which I sent to you in the late of March. I have received quite a good response to date but in order to draw valid conclusion I need some more. As explained in the earlier letter, I am now at the stage of investigating the level and relationship of OSHAP, OHSAS 18001 Efforts and OSHAPM in Malaysian automotive suppliers.

Your response to the questionnaire is very much appreciated as it is crucial for the success of my research which hopefully will be of great assistance to companies as similar to yours when trying to implement quality improvement programs.

I would appreciate your completion of the questionnaire and return it before 15th April so that I can progress to the next stage of the research. If you have already responded, please disregard this letter and accept my apology for inconveniencies.

I can assure you that your response will be kept confidential and only used for research purposes. If you have further inquiries about the survey or the research in general, please feel free to contact me. Please return the completed questionnaire in the envelope provided.

Thank you.

Yours Sincerely,

Auni Fatin Nadia Chiek Desa
Master of Accounting (Management Accounting),
Department of Accounting and Finance,
Faculty of Management and Economics,
Universiti Pendidikan Sultan Idris,
35900 Tanjung Malim, Perak, Malaysia.

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APPENDIX C1

Result of reliability analysis for OSHAP constructs

Actual Study

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.799	.800	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SC1	17.2518	16.247	.511	.276	.782
SC3	17.3165	14.232	.646	.421	.739
SC4	17.0144	16.563	.564	.326	.768
SC5	17.2122	14.543	.615	.388	.750
SC6	17.3058	15.058	.580	.351	.762

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.768	.768	6

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Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
EA1	22.4532	15.028	.515	.277	.733
EA2	22.5288	14.647	.541	.300	.726
EA3	22.3345	15.754	.507	.276	.735
EA4	22.4101	15.506	.551	.309	.724
EA5	22.4424	15.085	.535	.299	.728
EA6	22.3453	16.660	.422	.197	.755

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.712	.712	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
EI1	17.0971	10.492	.501	.320	.650
EI2	17.1223	10.606	.503	.309	.649
EI3	16.9604	10.630	.502	.264	.650
EI4	16.9856	11.292	.440	.218	.675
EI5	16.8993	11.232	.398	.168	.692

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Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.809	.807	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LD1	21.4712	22.084	.507	.269	.792
LD2	21.4892	20.171	.599	.408	.772
LD3	21.1511	20.316	.622	.426	.766
LD4	21.2302	20.626	.621	.406	.767
LD5	21.5647	20.384	.598	.370	.772
LD6	21.3129	22.945	.461	.251	.801

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.787	.786	6

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Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
EC1	22.6763	16.942	.502	.269	.764
EC2	22.6619	18.441	.454	.218	.773
EC3	22.7374	15.501	.619	.394	.734
EC4	22.7806	16.547	.592	.375	.742
EC5	22.6691	17.334	.524	.294	.758
EC6	22.6978	16.847	.535	.297	.755

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.704	.706	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
TR1	17.3237	10.191	.432	.189	.667
TR2	17.1115	10.367	.519	.275	.635
TR3	17.3381	10.463	.411	.181	.675
TR4	17.1906	10.299	.454	.221	.657
TR5	17.3381	9.380	.494	.244	.641

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APPENDIX C2

Result of reliability analysis for OHSAS 18001 Efforts constructs

Actual Study

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.820	.820	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PC1	21.2518	22.926	.537	.305	.802
PC2	21.2374	21.250	.608	.402	.787
PC3	20.9676	21.605	.618	.410	.785
PC4	20.9712	21.746	.638	.420	.780
PC5	21.2302	21.564	.616	.403	.785
PC6	21.0144	23.798	.495	.300	.810

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.723	.723	5

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Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PL1	17.0468	10.637	.493	.315	.671
PL2	17.0468	10.680	.489	.299	.673
PL3	16.8741	10.587	.512	.271	.663
PL4	16.9101	11.079	.470	.256	.680
PL5	16.8849	11.063	.443	.228	.691

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.728	.729	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
IO1	21.6187	14.388	.438	.195	.698
IO2	21.4065	14.632	.513	.277	.679
IO3	21.6331	14.854	.398	.181	.709
IO4	21.4856	14.431	.469	.233	.689
IO5	21.6331	13.049	.549	.313	.663
IO6	21.5755	14.751	.418	.210	.704

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Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.796	.797	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
CC1	17.2338	16.173	.506	.268	.779
CC3	17.3165	14.232	.633	.403	.739
CC4	16.9964	16.437	.566	.328	.764
CC5	17.1942	14.460	.612	.385	.746
CC6	17.2878	14.957	.579	.349	.757

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.788	.788	6

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Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
MR1	22.6115	16.376	.524	.319	.760
MR2	22.6403	17.885	.474	.261	.771
MR3	22.7626	15.676	.606	.382	.739
MR4	22.7590	16.184	.589	.371	.744
MR5	22.6655	16.924	.520	.292	.760
MR6	22.6763	16.588	.519	.282	.761

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.769	.769	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
CI1	22.4424	15.114	.517	.279	.734
CI2	22.5288	14.647	.546	.306	.726
CI3	22.3237	15.851	.508	.277	.736
CI4	22.3993	15.605	.552	.309	.726
CI5	22.4317	15.199	.534	.298	.729
CI6	22.3345	16.758	.423	.198	.756

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APPENDIX C3

Result of reliability analysis for OSHAPM constructs

Actual Study

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.724	.729	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
FP1	16.9460	8.160	.478	.262	.683
FP2	17.0827	9.347	.506	.286	.674
FP3	17.4532	9.108	.479	.230	.680
FP4	17.5360	8.365	.513	.287	.665
FP5	17.3561	8.649	.464	.237	.686

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Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.709	.712	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SP1	12.5935	4.184	.570	.333	.600
SP2	12.8022	4.231	.508	.261	.638
SP3	12.5863	4.843	.458	.236	.669
SP5	12.7266	4.228	.456	.216	.674

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APPENDIX D1

Result of total variance explained for OSHAP items

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.328	31.298	31.298	10.328	31.298	31.298	4.245	12.865	12.865
2	2.114	6.405	37.703	2.114	6.405	37.703	3.703	11.222	24.087
3	1.504	4.557	42.260	1.504	4.557	42.260	3.128	9.478	33.565
4	1.240	3.759	46.019	1.240	3.759	46.019	2.415	7.317	40.882
5	1.155	3.500	49.519	1.155	3.500	49.519	2.134	6.468	47.349
6	1.062	3.220	52.738	1.062	3.220	52.738	1.778	5.389	52.738
7	.980	2.970	55.708						
8	.929	2.816	58.524						
9	.843	2.555	61.080						
10	.841	2.549	63.629						
11	.811	2.459	66.088						
12	.782	2.369	68.457						
13	.732	2.218	70.675						
14	.697	2.112	72.787						
15	.667	2.022	74.809						
16	.649	1.966	76.775						
17	.639	1.936	78.711						
18	.594	1.799	80.511						
19	.573	1.736	82.247						
20	.564	1.709	83.956						
21	.538	1.629	85.585						
22	.525	1.592	87.177						
23	.494	1.498	88.675						
24	.473	1.433	90.108						
25	.450	1.364	91.471						
26	.429	1.299	92.771						
27	.403	1.222	93.993						
28	.380	1.153	95.145						
29	.375	1.136	96.281						
30	.343	1.041	97.321						
31	.315	.954	98.275						
32	.296	.897	99.172						
33	.273	.828	100.000						

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APPENDIX D2

Result of total variance explained for OHSAS 18001 Efforts Items

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.525	30.956	30.956	10.525	30.956	30.956	3.552	10.446	10.446
2	2.308	6.788	37.744	2.308	6.788	37.744	3.156	9.283	19.729
3	1.439	4.232	41.976	1.439	4.232	41.976	3.134	9.218	28.946
4	1.419	4.174	46.150	1.419	4.174	46.150	2.866	8.429	37.375
5	1.099	3.233	49.383	1.099	3.233	49.383	2.836	8.342	45.718
6	1.026	3.019	52.402	1.026	3.019	52.402	2.273	6.684	52.402
7	.982	2.889	55.291						
8	.956	2.811	58.101						
9	.949	2.790	60.892						
10	.891	2.620	63.511						
11	.811	2.384	65.895						
12	.796	2.341	68.236						
13	.729	2.143	70.379						
14	.712	2.095	72.474						
15	.670	1.970	74.444						
16	.659	1.939	76.383						
17	.615	1.809	78.193						
18	.606	1.784	79.976						
19	.570	1.677	81.654						
20	.552	1.622	83.276						
21	.530	1.559	84.835						
22	.520	1.530	86.365						
23	.501	1.474	87.839						
24	.478	1.405	89.244						
25	.455	1.339	90.583						
26	.433	1.273	91.856						
27	.415	1.222	93.078						
28	.400	1.176	94.254						
29	.363	1.068	95.322						
30	.357	1.050	96.372						
31	.338	.995	97.367						
32	.312	.917	98.284						
33	.305	.897	99.181						
34	.278	.819	100.000						

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APPENDIX D3

Result of total variance explained for OSHAPM items

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.811	31.232	31.232	2.811	31.232	31.232	2.792	31.019	31.019
2	2.144	23.826	55.057	2.144	23.826	55.057	2.163	24.038	55.057
3	.811	9.013	64.070						
4	.640	7.107	71.177						
5	.622	6.909	78.086						
6	.558	6.197	84.283						
7	.516	5.738	90.021						
8	.470	5.217	95.238						
9	.429	4.762	100.000						

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APPENDIX E1

Summary results of rotated factor matrix –Varimax with Kaiser Normalization (OSHAP)

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
SC1	.597					
SC2						
SC3	.560					
SC4	.472					
SC5	.512					
SC6	.519					
EA1			.548			
EA2			.569			
EA3			.529			
EA4			.553			
EA5			.573			
EA6			.507			
EI1		.616				
EI2		.579				
EI3		.553				
EI4		.499				
EI5		.536				
LD1				.553		
LD2				.602		
LD3				.607		
LD4				.652		
LD5				.614		
LD6				.496		
EC1						.589
EC2						.439
EC3						.596
EC4						.635
EC5						.499
EC6						.630
TR1					.502	
TR2					.576	
TR3					.524	
TR4					.504	
TR5					.640	
TR6						

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APPENDIX E2

Summary results of rotated factor matrix –Varimax with Kaiser Normalization (OHSAS 18001 Efforts)

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
PC1	.498					
PC2	.660					
PC3	.685					
PC4	.559					
PC5	.415					
PC6	.436					
PL1					.545	
PL2					.508	
PL3					.531	
PL4					.649	
PL5					.657	
IO1		.498				
IO2		.571				
IO3		.526				
IO4		.503				
IO5		.650				
IO6		.503				
CC1				.415		
CC2						
CC3				.686		
CC4				.717		
CC5				.758		
CC6				.660		
MR1			.613			
MR2			.426			
MR3			.577			
MR4			.634			
MR5			.500			
MR6			.626			
CI1						.548
CI2						.559
CI3						.515
CI4						.544
CI5						.544
CI6						.486

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APPENDIX E3

Summary results of rotated factor matrix –Varimax with Kaiser Normalization (OSHAPM)

Rotated Component Matrix[a]

	Component	
	1	2
FP1	.679	
FP2	.798	
FP3	.729	
FP4	.775	
FP5	.740	
SP1		.792
SP2		.741
SP3		.702
SP4		
SP5		.689

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APPENDIX F

List of Publications

Journal

1. Desa, A.F.N.C., Habidin, N.F., Hibadullah, S.N., Fuzi, N.M., and Zamri, F.I.M. (2013). OHSAS 18001 Performance Efforts and OSHA Performance in Malaysian Automotive Industry. *Journal of Environmental Science, Computer Science and Engineering Technology*, 2(2), 217-227.

2. Desa, A.F.N.C., Habidin, N.F., Hibadullah, S.N., Fuzi, N.M., and Zamri, F.I.M. (2013). Occupational Safety and Health Administration (OSHA) Practices and OSHA Performance in Malaysian Automotive Industry. *Journal of Studies in Social Sciences*, 4(1), 1-15.

3. Desa, A.F.N.C., Habidin, N.F., Hibadullah, S.N., Fuzi, N.M., and Zamri, F.I.M. (2013). The Impact of Occupational Safety and Health Administration Practices (OSHAP) and OSHAS 18001 Efforts in Malaysian Automotive Industry. *Journal of Applied Science and Research*, 1(1), pg 47-59.

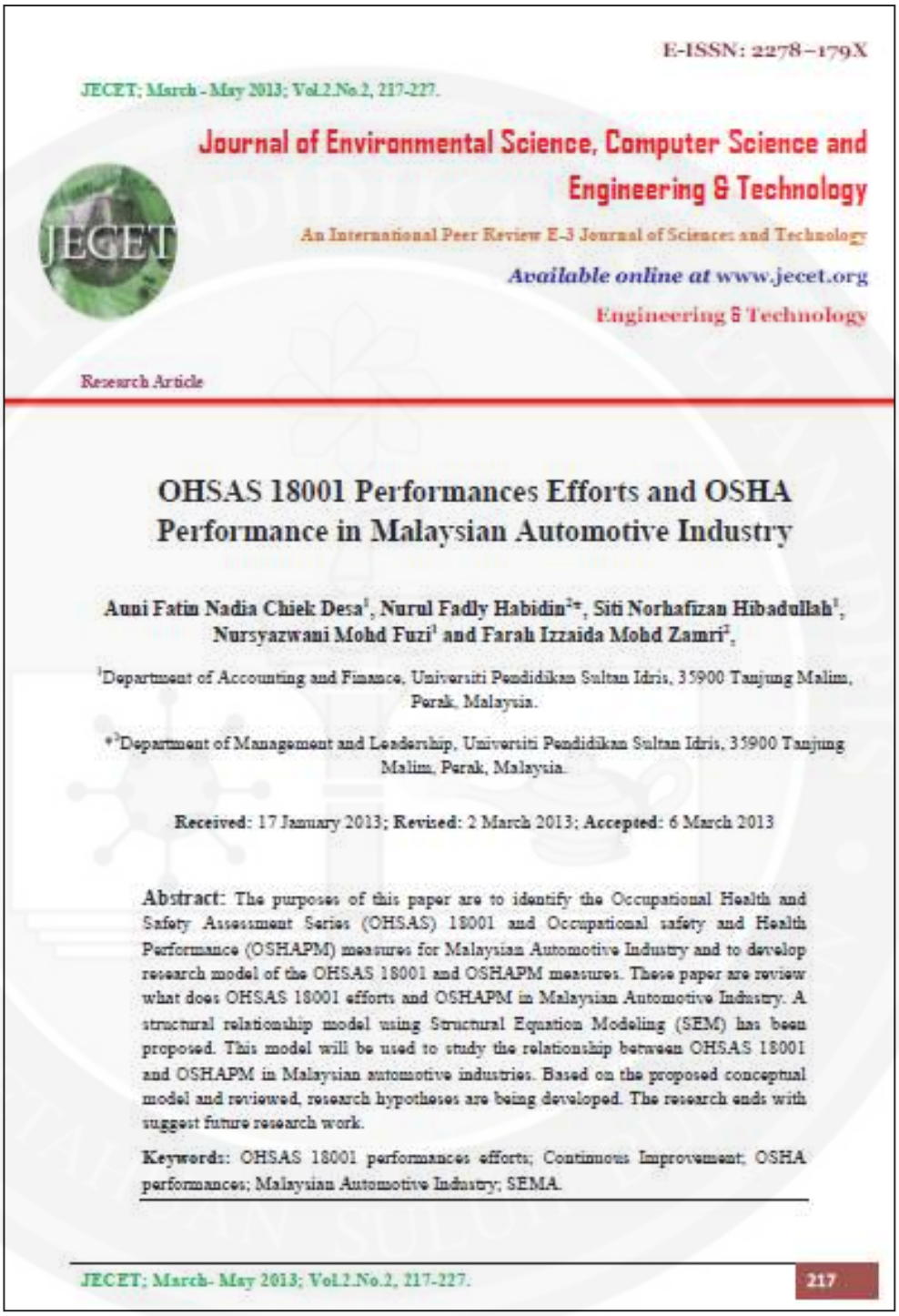
4. Desa, A.F.N.C., Habidin, N.F., Hibadullah, S.N., Fuzi, N.M., and Zamri, F.I.M. (2013). The Mediating Effect of OHSAS 18001 Efforts on the Relationships between Occupational Safety and Health Administration Practices (OSHAP) and Occupational Safety and Health Administration Performance (OSHAPM) Based on Automotive Industry in Malaysia. *International Journal of Management and Business Research*, x(y), pg 00-00. **Status:** Under Review

5. Desa, A.F.N.C., Habidin, N.F., Hibadullah, S.N., Fuzi, N.M., and Zamri, F.I.M. (2013). CSFs for the Occupational Safety and Health Administration Practice (OSHAP) for Malaysian Automotive Manufacturers. *International journal of critical Accounting.* **Status:** Under Review

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APPENDIX F-1



E-ISSN: 2278–179X

JECET; March - May 2013; Vol.2.No.2, 217-227.

Journal of Environmental Science, Computer Science and Engineering & Technology

An International Peer Review E-3 Journal of Sciences and Technology

Available online at www.jecet.org

Engineering & Technology

Research Article

OHSAS 18001 Performances Efforts and OSHA Performance in Malaysian Automotive Industry

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Received: 17 January 2013; **Revised:** 2 March 2013; **Accepted:** 6 March 2013

Abstract: The purposes of this paper are to identify the Occupational Health and Safety Assessment Series (OHSAS) 18001 and Occupational safety and Health Performance (OSHAPM) measures for Malaysian Automotive Industry and to develop research model of the OHSAS 18001 and OSHAPM measures. These paper are review what does OHSAS 18001 efforts and OSHAPM in Malaysian Automotive Industry. A structural relationship model using Structural Equation Modeling (SEM) has been proposed. This model will be used to study the relationship between OHSAS 18001 and OSHAPM in Malaysian automotive industries. Based on the proposed conceptual model and reviewed, research hypotheses are being developed. The research ends with suggest future research work.

Keywords: OHSAS 18001 performances efforts; Continuous Improvement; OSHA performances; Malaysian Automotive Industry; SEMA.

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APPENDIX F-2

Journal of Studies in Social Sciences
ISSN 2201-4624
Volume 4, Number 1, 2013, 1-15

Occupational Safety and Health Administration (OSHA) Practices and OSHA Performance in Malaysian Automotive Industry

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Abstract: This paper addresses the issues of occupational safety and health administration practices (OSHAP) and the occupational safety and health administration performances (OSHAPM) that influence by the practices in Malaysian Automotive Industry. This paper also proposed structural relationship OSHAP and OSHAPM model. The implementation of OSHAP is widely believed that it can increase the OSHAPM in automotive industry. This paper discusses the OSHAP which are safety culture, employee involvement, employee attitude, leadership style, safety and health training and effective communication that may have an impact on OSHAPM which are safety and financial performances in the automotive industry. This study theoretically reviewed prior literatures on same problems in our Malaysian industry. Based on previous study, there are positive relationships between OSHA practices and OSHA performances major on safety and financial performances. The target was to reduce some problems in research.

Keywords: OSHAP; OSHAPM; Safety Performances; Financial Performances; Malaysian Automotive Industry.

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The Impact of Occupational Safety and Health Administration Practices (OSHAP) and OHSAS 18001 efforts in Malaysian Automotive Industry

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ABSTARCT

Occupational Safety and Health Administration Practice (OSHAP) and Occupational Health and Safety Assessment Series (OHSAS) 18001 standards become important to the Automotive Industry in Malaysia. The purposes of this paper are to identify the OSHAP and OHSAS 18001 and develop research model of the OSHAP and OHSAS 18001 efforts for Malaysian Automotive Industry. OSHA management practices can creates a decrease or an increase in certain measurement variables in organization. This paper is reviewed what OSHAP and OHSAS 18001 efforts and proposed structural relationship models using Structural Equation Modeling (SEM) as recommended. Since this is a concept paper, most of the literature from the previous survey taken as a basic guide for this study as well as the construction of models of the relationship between the OSHAP and OHSAS 18001 Efforts is made. Next, the hypotheses can be generated based on the model of the proposed research and literature review. It has been shown that the OHSAS 18001 Efforts which acts as an intermediary for the Malaysian automotive industry can continue to perform to make the transformation OSHAP management system in the Malaysian automotive industry more efficiently and effectively in line with the industry to be the best among the competitors in other countries. Based on the proposed conceptual model and reviewed, research hypotheses are being developed. The research concludes with suggest future research work.

Keywords: OSHA Practices; OHSAS 18001; occupational injuries; unsafe workplace; continuous improvement; Structural Equation Model.

INTRODUCTION

Malaysia have their own advantages because it centrally located in the ASEAN region with a population of more than 500 million people and offers large opportunities for global automotive and component manufacturers to establish manufacturing and distribution operations in the country (MIDA, 2010; Fuzi et al., 2012). Furthermore, automobile industry in Malaysia was showed growth year by year through joint venture with others countries to produce better products by using

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List of Participation

Conference

1. Desa, A.F.N.C., Habidin, N.F., Hibadullah, S.N., Fuzi, N.M. and Zamri, F.I.M. (2013). The occupational safety and health administration practices (OSHAP) and OSHAS 18001 performances efforts in Malaysian Automotive Industry. Conference on Social, Development and Environmental Studies 2013, 19 March 2013, Universiti Kebangsaan Malaysia (UKM), Bangi.

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Lists of Awards

Poster

1. ***Bronze Award**:* Audit Quality Engineering Management System (AQEMS): Eco Design Decision Making Process (MTE 2013), 20th –23th February 2013, PWTC, Kuala Lumpur, Malaysia.

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MARS
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Bronze Medal

This Certificate of Award is presented to

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Dr. Nor Azrin Mad Latip
Mad Ithnin Salleh
Farah Izzaida Mohd Zamri
Nursyazwani Mohd Fuzi
Siti Norhafizan Hibadullah
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