THE INFLUENCE OF SAFETY CLIMATE ON SAFETY PERFORMANCE: A STUDY ON THE CONTRACTORS OF MOTOROLA SOLUTIONS, PENANG

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PENGARUH IKLIM KESELAMATAN KE ATAS PRESTASI KESELAMATAN: KAJIAN TERHADAP KONTRAKTOR-KONTRAKTOR MOTOROLA SOLUTIONS BHD

ABSTRAK

Kajian ini bertujuan untuk mengkaji pengaruh iklim keselamatan dan prestasi keselamatan kontraktor yang bekerja di bahagian kompaun pembinaan dan kerja renovasi Motorola Solutions Bhd. Dimensi iklim keselamatan yang telah dikenalpasti untuk kajian ini adalah amalan keselamatan pihak pengurusan, amalan keselamatan pihak penyelia, sikap keselamatan, latihan keselamatan, keselamatan pekerjaan dan pematuhan keselamatan oleh rakan sekerja. 80 borang soal-selidik telah diedarkan kepada pekerja dan staff yang terlibat dengan projek pembinaan di Motorola Solutions Bhd. di Pulau Pinang untuk mengkaji kesedaran dan ilmu mereka akan keselamatan di tempat kerja. Progam SPPS versi 19 telah digunakan untuk menganalisa data kuantitatif. Analisis-analisis yang digunapakai untuk kajian ini adalah Ujian kepercayaan, ujian korelasi dan ujian regresi berganda. Ujian korelasi Pearson menunjukkan semua iklim keselamatan yang dikaji dalam pennyelidikan ini positif dan memberi impak yang besar terhadap prestasi keselamatan. Namun, ujian regresi membuktikan hanya dua iklim keselamatan yang dikaji amalan keselamatan pihak pengurusan dan amalan keselamatan pihak penyelia memberi impak positif dan korelasi tertinggi dengan komponen-komponen iklim keselamatan dan prestasi keselamatan. Walau bagaimanpun, sikap keselamatan dikenalpasti mempunyai impak yang tidak signifikan dengan presetasi keselamatan dan iklim keselamatan. Akhir sekali, implikasi kajian turut dibincangkan serta cadangan untuk kajian hadapan.

THE INFLUENCE OF SAFETY CLIMATE ON SAFETY PERFORMANCE: A STUDY ON THE CONTRACTORS OF MOTOROLA SOLUTIONS BHD

ABSTRACT

This study aims to determine the influence of safety climate on safety performance of the contractors engaged for renovation works for Motorola Solutions Bhd. The study focussed on the following six dimensions of safety climate, which are management safety practices, supervisor safety practices, safety attitudes, safety training, job safety and co-worker safety practices. It also focussed on two dimensions of safety performance, which are safety compliance and safety participation. 80 sets of questionnaires were distributed to employees of the construction contractors at Motorola Solutions Bhd, Penang to test their perceptions on safety aspects. SPSS software version 19 was used for quantitative data collections. It involves the analysis of descriptive statistics, testing of the reliability, Pearson correlation test and regression test. Pearson correlation testing found a significant positive correlation between almost all dimensions of safety climate and safety performance and its components. Meanwhile, regression test shows that management safety practices and supervisory safety practices have an adverse impact on the safety performance components. Meanwhile, only the safety climate, safety attitude is non-significant on safety performance dimensions based on the analysis. Lastly, implications of the study were discussed as well as provide recommendations for future studies.

ACKNOWLEDGEMENT

In the name of the Almighty, Most Gracious, Most Merciful

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Last but not the least, all my colleagues at Motorola Penang, I thank you from the bottom of my heart for your continued support and encouragement.

Finally, I wish this report will be a useful reference for future researchers and for those seeking relevant safety and health guidance.

Thank You

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LIST OF ABBREVIATIONS AND SYMBOLS

Short Forms	Descriptions
ANOVA	Analysis of Variance
DAFWC	Days Away From Work Case
DOSH	Department of Occupational Safety and Health
EHS	Environment, Health and Safety
HIRARC	Hazard Identification, Risk Assessment and Risk Control
JKKP	Jabatan Keselamatan dan Kesihatan Perkerjaan
NIOSH	National Institute of Occupational Safety and Health
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Act 1994
SOCSO	Pertubuhan Keselamatan Sosial

CHAPTER 1

INTRODUCTION

1.1 Research Background

The assessment of accident rates and injury rates at workplace had been widely done in various industries in identifying the safety performance for many years in terms of frequency of occurrence of accidents and injuries (Wu et al., 2010).

In many countries, accidents at workplace received big attention as it cost enormously. Thus, the efforts in maintaining a safe work environment is one of the major concerns of almost all companies in the world as accident at workplace is a direct measure of safety performance at workplace (Abdul Wahab et al., 2010; Hee & Ping, 2014). It has been claimed that "the smaller accidents happen in a workplace, the safer the workplace is". Nevertheless, the claim holds very little truth. The idiom failed to emphasize that minor injuries may also threaten employees' safety and bring cost to the organizations (Abdul Wahab et al., 2010). Occupational accidents severely deteriorate human capital, and hence give a negative impact on the productivity and competitiveness of countries (Fernandez-Muniz, Montes-Peon, & Vazquez-Ordas, 2009)

The construction industry is one of the leading industries that reports one of the highest workplace accident records. For example, China, one of the rapid growing countries in the past two decades had recorded approximately 46% of its annual injury of all occupational injuries incurred in the construction industry in

1999. The injury rate per 1000 construction workers was 248.6 and 199.1 in 1998 and 1999 respectively (Siu et al., 2004). In the same note, around 120 construction workers are killed every year at construction sites and about 3000 workers suffer major injury in construction related injuries in the UK. In some cases, not only construction workers are affected, but, on average, one member of the public, including children, is killed each month, with further 1200 major injuries reported under Reporting of Injuries, Diseases and Dangerous Occurrence Regulations (RIDDOR) (Sawacha et al., 1999).

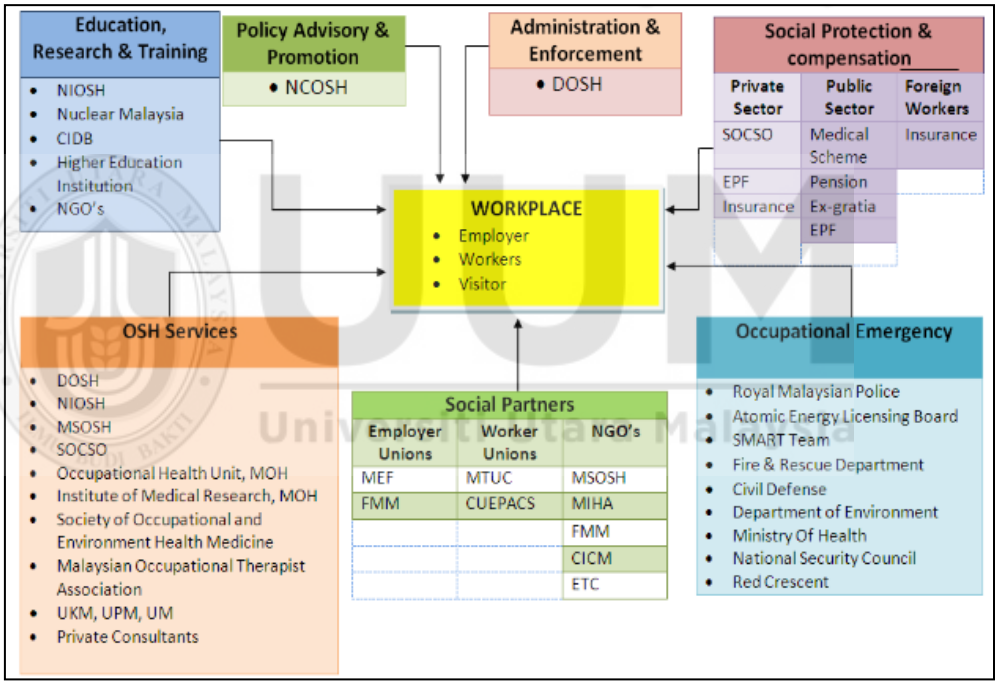


Figure 1.1
Occupational Safety and Health layout in Malaysia (Source: Department of Occupational Safety and Health (DOSH) Malaysia)

In Malaysia, we have government and non-government bodies which playing vital roles as to improve the safety standards. However, accidents still occurred and there are no initiatives were taken by the companies as to improvise their OSH management systems. For an example construction sector, the

construction industry tends to have a poor awareness on the important, implications and benefits of having safety practices in place. Resulting in cost and corner cuttings, the tendering process for contracting construction works also often gives little attention and consideration on safety aspects. Additionally, Occupational Safety and Health (OSH) record of the construction industry has always been highlighted as unsatisfactory or unpleasant spot. It is because the OSH management system is a neglected and a function that has not been pursued systematically in the construction industry (Azimah et al., 2009). The increasing injury rates are mainly due to poor or absence of an OSH management system. Therefore, many occupational accidents and injuries are due to a failure in the existing OSH management system. Hence, the application of an 'effective' management can lead to safer systems of construction and reduce accidents (Vinodkumar & Bhasi, 2010).

Recently, the measure of safety at workplace had moved from purely retrospective data, also known as "lagging indicators" like fatalities, towards approaches like safety audits or measurements of safety climates. These are also known as "leading indicators" as they provide predictive measures to enable a more effective safety condition monitoring (Flin et al., 2000). As part of this exploration, safety climate has been cited as the plausible antecedent of workplace safety. Safety climate is seen as an organization's "temporary state of safety" or a snapshot of the prevailing state of safety in an organization at a discrete point in time (Huang et al., 2006). Several arguments arise on the effectiveness of this monitoring method, as the system reduce the need to wait for the system to fail in order to identify the flaws and take corrective measures. In other words, the

transition can be conceptualized as the switch from feedback to feed forward control.

Donald and Canter (1994) highlighted that organizational climate is a useful related concept in considering the organizational factors associated with risk and accidents. In a separate research, Cheyne and team in 1998 used a structural equation modelling to examine the framework of the relationships between dimensions of organizational safety climates and employees' attitude towards safety issued explained levels of safety activities (Siu et al., 2004). Safety climate is another type of climate that can be applied by individuals in organization of various backgrounds. Specifically, safety climate are conceptualized as a higher order factor which is comprised of more specific first-order factors, namely reflecting employees' perceptions of safety-related policies, procedures, and rewards in the organization (Griffin & Neal, 2000).

Research works in the area of occupational safety became viral in the past three decades. The objective is to predict safety related outcomes such as accidents and injuries in order to provide valuable guidance for improving safety in organizations (Vinodkumar & Bhasi, 2010). It is commonly accepted that attitudes and perceptions of the employees is the "on" and "off" switch for an accident to occur. Thus, there are many factors do influence workers behaviour at the workplace. Donald and Canter (1994) noted in their research that organizational climate is a useful related concept since the organizational factors linked to risk and accidents. Safety were known also as climate which refer to a particular area of organizational functioning (Siu et al., 2004).

The accident statistics by sector is illustrated in Figure 1.2. Based on the statistics verified by the Department of Occupational Safety and Health (DOSH) of the Malaysian Ministry of Human Resources, shows that construction sectors contributed 7.1% of the total accident cases recorded. With a record of 138 cases involving death, 37% of non-permanent disability and 5 % of permanent disability cases from a total of 237 recorded cases in the year 2015. In an above all, construction industry comes in as the 3rd sector with the highest occupational accidents in 2015 after Manufacturing, and Agriculture, Forestry, Logging and Fishery industries respectively. Therefore, the construction industry is still spotted as an area which requires special attentions and room for improvements.

As per the construction site in Motorola Penang, the contractors are exposed to various safety climate that would give effect on both work and safety performance of the project. According to Radhlinah (2000), construction industry will be benefited if there is an improved attitude change that cultivates a vision for the future, which increases safety concerns and effectively integrates them into the overall management system (Siu et al., 2004). Therefore, a study has been initiated mainly is to analyse the probable climates the construction workers are exposed to and correlate with the safety performance of the company.

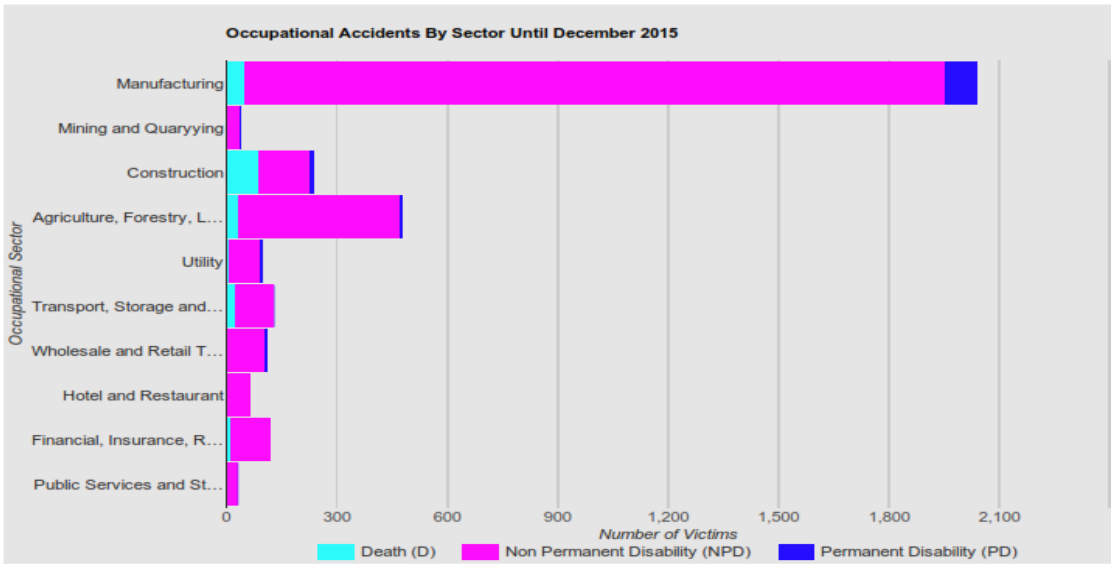


Figure 1.2
Occupational Accident Statistics by sector in 2015 (Occupational Accidents Statistics by Sector Until December 2015, 2015)

1.2 Problem Statement

Employee safety is both economically and legally are costly. Annually, companies lose large amount of money due to occupational accidents. Hence, improvements in safety in the workplace are often necessary for economic and legal reasons (Siu et al., 2003). In various industries, with the growth of technology, the amount of manpower required in handling hazardous and high-risk jobs could be controlled and minimized. Nevertheless, several industries or work scopes still require for the man handling and thus still creates a significant risk.

The construction industry is one of the industries which still require manpower in handling the job in various stages and phases scopes. The construction industry is an important sector of any national economy, especially due to its high employment potential (Vinodkumar & Bhasi, 2010). However,

accidents, incidents, injuries and fatalities prone to occur continuously on construction sites around the world, at consistently high rates despite the safety policy and regulations imposed. In a study by Deste and Blockley in 1995, it was suggested that "unsafe behaviour" is the most significant factor that causes accidents at construction sites. Nevertheless, HSE report shows that 90% accidents that leads death could be prevented (Sawacha et al., 1999).

Construction consists of not only building an infrastructure, but also maintenance and renovation projects are considered as a construction project. These maintenance and renovation project involves improvement the aspects of electrical and safety features in an infrastructure. Currently, Motorola Solutions Penang is engaged in a construction project to perform building maintenance works, constructing new facilities and renovation building works.

The Main Campus operations include R&D, manufacturing and administration. The R&D Centre is the design facility for two-way digital and conventional radio system. The primary manufacturing operations include production of two-way radios, battery flexes and embedded computing communications devices. Raw materials included printed circuit boards (PCBs), flexes, solder pastes, battery cells and electronic components (*Environmental , Health and Safety Compliance Audit Motorola Technology Sdn Bhd*, 2007). The production process is divided into two separate areas:

i. Front End – circuit board printing, chip placement and reflow process; and
ii. Back End – model assembly, testing and packing.

The facility occupies approximately 20 acres within the Bayan Lepas Technoplex Industrial Park, a location consisting primarily electronics- related manufacturing facilities and operate on a 24 hour, 7 days per week. Motorola Penang was established in 1974 but the current facility began operations in 1999 and has an estimated workforce of 3500 employees. Currently, the contractor is engaged in a re-stack project whereby the R&D office and acoustic laboratory were relocated to the newly completed Innoplex Building. This relocation exercise resulted in vacant space at the 2nd floor, above the Cafeteria which was renovated as office area. Besides, the pendent sprinkler system will be impaired and the upright sprinklers will remain active throughout the renovation. New pendent sprinkler will be added or relocated to ensure adequate coverage (Tan, 2014).

Independent contractors are hired for the construction project, and prior start of this project, there are few phases of planning, evaluation and assessment, whereby these new contractors are audited before being hired. This is known as the Contractor OSH Management System by the EHS Department of Motorola Solutions Inc. Upon hiring, they are required to attend New Contractor Orientation (NCO) training session. In this training session, the contractor is briefed with the Environment, Health and Safety (EHS) policies and practices of the company. The project coordinator is responsible for the contractor and shall ensure all workers comply with the company rules and safety policies (*New Contractor Orientation - Independent Contractor*, 2013).

Although the Contractor OSH Management System is being implemented, the accidents and incidents still occur. In this Contractor OSH Management

System, the following are implemented to ensure the safety compliance and participation of the new contractors are well educated and motivated.

i. Contractor Qualification

Independent contractors are required to be qualified to work on Motorola owned or operated sites and shall be re-qualified at a minimum of every 3 years from original approval date.

ii. Training and Competency

Minimum training required include NIOSH Contractor Safety Passport and undergo Motorola NCO to ensure contractors are aware of OSH legal and Motorola EHS requirements as well as the safe working procedures.

iii. Work Permit System

Main objective is to identify the potential hazards in work plant and to layout control measures to minimize risks

iv. Inspection and Monitoring

Project coordinator will conduct initial level and ongoing inspection and monitoring throughout the construction period to verify safety precautions taken and ensure safe working culture. EHS personnel will also perform spot checks to verify whether the contractors adhere to the EHS requirements and work safety (*Contractor safety system - Project Coordinator Training*, 2012)

1.3 Research Questions

Based on the previous discussion, this research seeks to provide insight on the following questions:

i. What are the relationships between the dimensions of safety climate (management safety practices, supervisor safety practices, safety attitudes, safety training, job safety and co-worker safety practices) and safety performance of contractors in Motorola Solutions Inc. Penang?

ii. Which safety climate dimension (management safety practices, supervisor safety practices, safety attitudes, safety training, job safety and co-worker safety practices) gives the most significant effect on the safety performance of contractors in Motorola Solutions Inc. Penang?

1.4 Research Objectives

The objectives of this study are as follow:

i. To determine the relationship between dimensions of safety climate (management safety practices, supervisor safety practices, safety attitudes, safety training, job safety and co-worker safety practices) and safety performance of construction workers in Motorola Solutions, Penang.

ii. To analyse the influence of safety climate dimensions (management safety practices, supervisor safety practices, safety attitudes, safety training, job safety and co-worker safety practices) on safety performance of construction workers in Motorola Solutions, Penang.

1.5 Scope of the study

This study focusses on two main variables i.e. safety climate and safety performance. Safety climate is being studied based on six dimensions i.e. management safety practices, supervisor safety practices, safety attitudes, safety training, job safety and co-worker safety practices. Safety performance on the other hand is being studied based on two dimensions i.e. safety compliance and safety participation. Respondents for this study was employees of construction contractors at Motorola Solutions, Penang.

1.6 Significance of the study

Safety climate assessment can be used as a benchmark to evaluate the safety performance of an organization. The safety performance based on the safety climate signifies the effectiveness of safety program of an organization. This research is carried out to assess all probable safety climates that are exposed to the construction workers, which can influence the safety performance. This study gives access to further look into the safety program, namely the Contractor OSH Management System that is being practiced in Motorola Solutions Inc. The survey questionnaire believed to be able to analyse the work culture and safety behaviour of the construction workers, at the same time justify the reliability of the gathered data via the survey.

Based on the data gathered, it would enable the Motorola EHS Department to review and improvise the Contractor OSH management system, at the same time, cultivate a better safe working environment at the construction site.

1.7 Limitations of the study

This study involves the on-site construction workers in Motorola Solutions Inc. Penang, as the target group. Target group with the sample size of 80 people are chosen to fill up the questionnaire survey, which comprise of questions that relates the dimensions of safety climate (management safety practices, supervisor safety practices, safety attitudes, safety training, job safety and co-worker safety practices) and its influence on the safety performance.

In the survey measurement, two basic assumptions that are made on the study are:

i. Respondents who completed the questionnaire did so on their own free will

ii. Respondents who completed the questionnaire answered the questions honestly and accurately

Nevertheless, by using the survey questionnaire instruments, the study is prone to face several limitations as listed below:

i. Study was limited to self-reported data with no observational follow up to verify the conditions as it was reported

ii. Study were limited to the on-site construction workers at Motorola Solutions Inc. Penang which voluntarily chose to complete the survey

iii. The respondents' answer is largely influenced on the psychological and physical condition of the respondents at point of completing the survey

iv. Language barrier of the on-site construction foreign workers with limited knowledge in English & Malay language

Finally, the scope of this research is focused on the EHS practice and policies by Motorola Solutions Inc. as per on the Occupational Safety and Health Act (OSHA) 1994. As per stated in Part 1(4), the act main objective is:

i. To secure the safety, health and welfare of persons at work against risks to safety or health arising out of the activities of persons at work;

ii. To protect persons at a place of work other than persons at work against risks to safety or health arising out of the activities of persons at work;

iii. To promote an occupational environment for persons at work which is adapted to their physiological and psychological needs; and

iv. To provide the means whereby the associated occupational safety and health legislations may be progressively replaced by a system of regulations and approved industry codes of practice operating in combination with the provisions of this Act designed to maintain or improve the standards of safety and health. (*Act 514 Occupational Safety and Health Act*, 1994)

1.8 Arrangement of Research Paper

Chapter 1 acts as the backbone of the whole research study. The main components of the research study are presented in this chapter are: research background, problem statements, scope of study, research objectives the significance and limitations of the study

Chapter 2 focusses on the literature by researcher covering the similar subject and its methodologies. Studies by the researchers in the past are used to design the structure and scope of this research. A thorough study on the dependent variable, safety performance (safety participation and safety compliance) and the independent variable, safety climates (management safety practices, supervisor safety practices, safety attitudes, safety training, job safety and co-worker safety practices) are covered in this chapter

Chapter 3 comprises of the research methodology and complete project structure. A step by step explanation on the data collection and analysis process is explained in this chapter. Discussions and citation by previous researchers are included to further enhance the reliability of the methodology used from the preliminary study stage to the data collection analysis.

In Chapter 4, the accumulated data from the survey instruments are analysed and presented. Several types of statistical analysis are included, namely descriptive analysis, trustworthy analysis, correlation analysis and multiple regression analysis. The data are presented in form of tables and graph to enable better understanding and a much effective presentation method.

Chapter 5 gives summarizes the data analysis and interpretation presented in Chapter 4, at the same time results are compared with the studies of researchers from the past. This chapter also includes the limitations and the recommendations on the ways to overcome the limitations and challenges faced by the management. Also, an overall view and reflect upon the research study in retrospect.

1.9 Summary

The increased cost of work-related accident had driven organizations to develop safety programs that enable the employees' to be protected at the same time complying with OSHA 1994. The safety management system is rapidly changing to meet the requirements of the workforce and the environment the workers are exposed to. The construction industry is one of the industries that records the highest work-related injuries and accidents yearly. In Motorola Solutions Inc. Penang, the hired contractors and workers are required to attend safety training programs designed by the EHS department alongside company management as a step in creating awareness among the works at the same time with hope to create a safe work environment. The safety climate study, being one of the most viral areas of study, and thus the correlation to the safety performance is the best subject to study on the on-site construction workers at Motorola Solutions Inc. Penang.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Chapter 2 mainly discusses the works of previous researchers on the aspects of safety performance; (1) Safety compliance, (2) safety performance and (3) safety climates, are the dimensions revolving the construction workers. The adopted independent variables towards the dependent variable do influence a significant result in this study. Both safety climate and safety performance plays a vital role in the construction activities at Motorola Penang. This research mainly focused on the safety climates that are adopted from the findings of published literatures on the safety performance of construction workers.

2.2 Safety Performance

In the context of safety, two spectrums; task and contextual performance are not simultaneously examined with the exception of few researchers. In general, work behaviour is related to safety and how it affects the work performance. The work safety is an important factor in determining the success of any safety practices. Thus, it affects the safety performance at workplace. Within the safety definition, the two spectrums, task performance and safety performance have not been simultaneously examined with exception of a few studies. (Snyder et al., 2011). In previous works, safety performance has been measured via range of factors like accident rates, injuries, safety behaviours and safety involvement.

The current study is different as it focuses on developing safety-specific measures on the roles of safety understanding of control and supervisor contributions (Neal & Griffin, 2002)

2.2.1 Definition of Safety Performance

Neal and Griffin defined safety performance as a conceptual correlation between safety behaviour and safety climate (Neal & Griffin, 2002). The components of performance represent the behaviours that individuals perform at work as illustrated in Figure 2.1. The model differs from that proposed by Bormanm and Motowildo's in 1993, with two types of safety behaviour; Safety compliance and safety participation (Griffin & Neal, 2000). These two safety performance dimensions are selected in order to study the effect of safety climate on both safety compliance and safety participation among construction workers in Motorola Penang.

An organization's location within the safety space depends on how well the organization manages its hazards. An improvement on the safety performance in an organization can increase its resistance or robustness and reduce the risk level of the accidents. However, poor safety performance may hike up the organization's vulnerability and therefore, increase the risk of accidents (Nevhage & Lindahl, 2008). Even though there is no common definition of safety performance; the determinants of performance represent the proximal causes of variability in performance. Knowledge, skills and motivation are factor that directly affects the task and contextual performance. The antecedent on the other hand, represents the causes for this variability of the safety performance to occur.

The antecedents identified based on works from previous researchers are namely at individual and organizational level (Griffin & Neal, 2000).

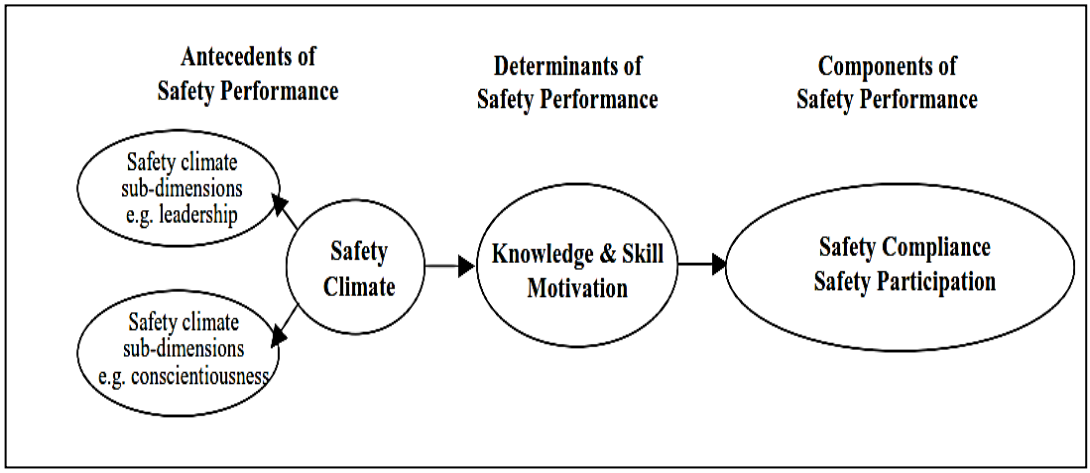


Figure 2.1
A model of relations among antecedents, determinants and components of safety performance

Figure 2.1 provides a schematic illustration of the relationship between safety climate and safety performance. The model by the previous researchers does not make distinctions between the antecedents and determinants performance. Nevertheless, individuals safety behaviour may constructs aspects of safety climate at workplace (Neal & Griffin, 2002). Work from other industries has linked rates of injuries and accidents with safety climate and related dimensions (Clarke 2006). For example, within health care industry four studies (report a link between numbers of medication errors and other outcomes) with measures of selected safety behaviours and contextual factors in hospital units. In addition, one study found that better safety climate corresponded to lower rates of incident reports for four hospitals. From this, a conclusion can be drawn that safety climate becomes one of the determinants for safety performance within an organization

2.2.2 Dimensions of Safety Performance

The concept of safety performance originated from work performance with incorporation of safety elements. Borman and Motowidlo in 1993 were the first researchers to articulate the difference between task performance and contextual performance. These two components of performance can be used to differentiate safety behaviours in the workplace (Shang & Lu, 2009). Task performance defined as the behaviours that are formally recognized as part of the job and directly contributes to the specific goals of the organization. On the other hand, contextual performance are those behaviours that do not directly support the specific purpose of the organization, but instead generate a social and psychological environment in which the purpose of the organization can be more effectively achieved (Snyder et al., 2011). Many organizations are taking count the aspect of safety performance for employees' promotion or even termination since the measurement of safety performance accurately reflects the probability of future accidents at workplace (Veley et al., 2004). The two dimensions of safety performance are safety compliance and safety participation. These two dimensions, being the dependent variables, are chosen to determine the safety performance among the construction workers at Motorola Penang.

2.2.2.1 Safety Compliance

Safety compliance is termed as the activities that adheres the safety procedures and carrying out work in a safe manner (Neal et al., 2000). The term safety compliance is used to describe the core activities that need to be carried out by individuals to maintain workplace safety. The activities include the standard

procedures at workplace and utilization of personal protective equipment (PPE). Such actions are the core behaviours required to perform the job and ensure workplace safety (Griffin & Neal, 2000).

Safety activities include subjective appraisals of the physical work environment and workplace hazards, managerial assessments of employee's safety compliance. Safety hazards and self-reported compliance (Neal & Griffin, 2006). In a separate research, Marchand et al. explored the safety behaviour in terms of required compliance to rules and more discretionary initiative behaviours (Jones & Fletcher, 2003). Several studies also show that other variables like safety motivation may affect the safety compliance at the place at work. In the study by Probst and Brubaker in 2001, the lagging safety motivation among workers gives an effect on the safety compliance within 6 months' time (Neal & Griffin, 2006).

Ironically, in the matter of safety compliance within an organization, keeping employees conscious of the probabilities for injury can be particularly challenging for an organization with a low rate of injuries. Under such conditions, where long spans of time pass without serious injury, safety can lose its predominant bond with employees' well-being, and other issues become more highly associated with colleagues' welfare, such as the equitable distribution of workload among the team, or equal access to training and promotion opportunities. Thus, without the consistent messages to maintain an awareness of the risk of injury, caring employees may take up other causes to benefit their colleagues. In a benevolent climate, the frequent use of safety messages becomes a means of encouraging safety compliance behaviour as a way to benefit everyone in the company (Kapp & Parboteeah, 2008).

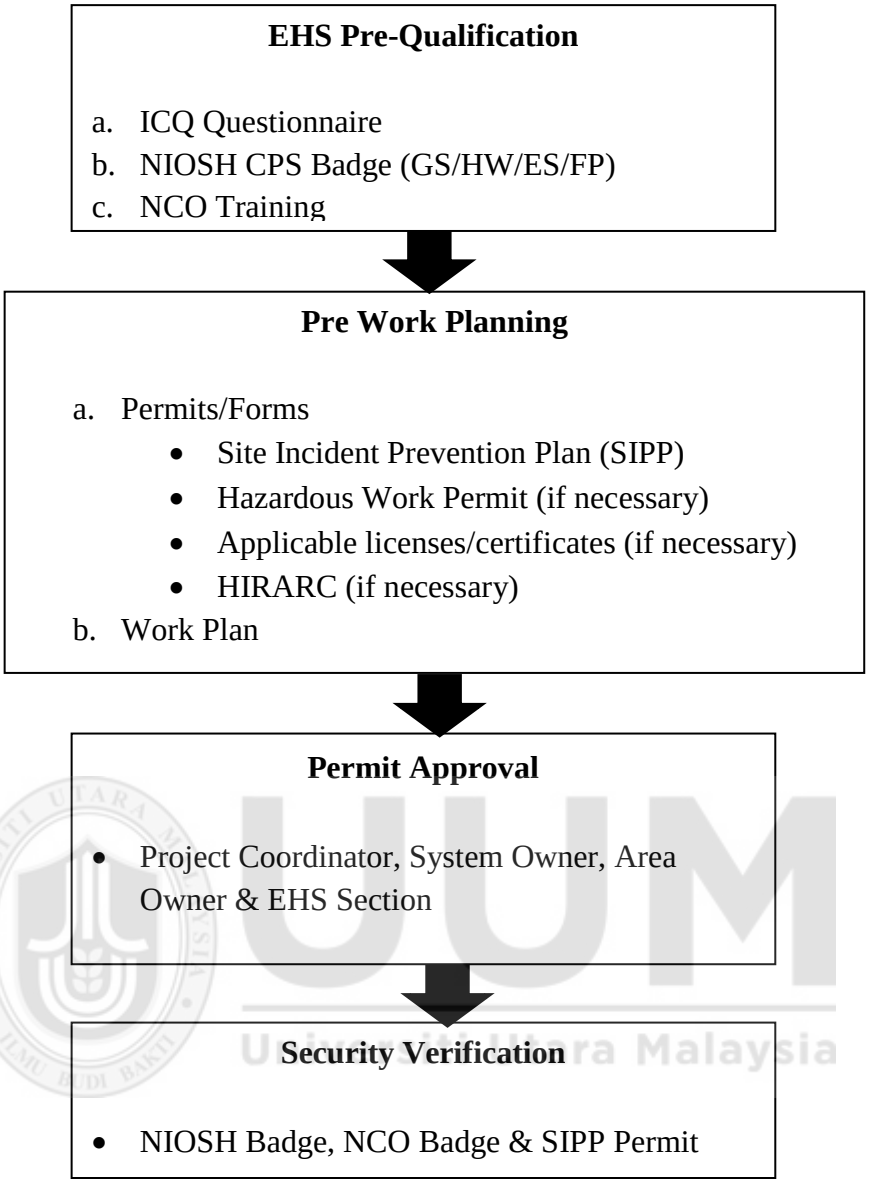


Figure 2.2
Motorola Inc. contractor safety management plan

Occupational Safety and Health Act (OSHA 1994) acts as the guide for companies in Malaysia to introduce safety procedure to be adhered to by the employees. In conjunction with OSHA 1994 Section 15 (2) "It shall be duty of every employer as to ensure the provision of information, instruction, training and supervision provided to the employees". Hence by considering OSHA 1994 section 15, Motorola implemented Contractors Safety Management System

including manpower arrangements to ensure the safety of the workers and contractors working at Motorola premises.

In Motorala Inc. Penang., the construction workers are complying to attend safety training prior starting their job at the construction site. Figure 2.2 illustrates the pathway for the contractor and construction workers before starting their job at the construction site. Also, the Independent Contractors Questionnaire procedure was implemented to ensure contractors are qualified, randomly evaluated, inspected and monitored their EHS activities. This is to ensure the workers always remember the importance of safety

This procedure helps the contractors to manage safety and health risks, ensure compliance to applicable EHS programme, confirm the contractor received require training for their work; comply with law and regulation and EHS requirement. Basically, these procedures and regulations help the project contractors and project coordinators to manage the safety and health risks at the construction site. At the same time, this system will also ensure the compliance of the workers to the company's safety policies. The project manager is responsible in choosing the contractors and to make sure the workers comply with the environment, safety and health (EHS) policies of Motorola Inc. and Contractors OSH Management System.

At present, Motorola Inc. safety policies and contractor OSH management system are more stringent and comprehensive as to make the contractors to adhere the safety procedures in place. This proves that safety is one of the core values in Motorola Inc. and cannot be compromised under any circumstances. For any new projects in Motorola premises, various safety programs besides the new

orientation training (NCO), tender briefing, contractors' safety hand book, safety consultation, awareness training and others were provided to educate the workers on safety knowledge. Nevertheless, workers can't meet the required standards and regulations, hence the compliance towards safety policies needs to be studied for further improvement of the system and minimizing risks of accidents.

2.2.2.2 Safety Participation

Safety participation can be simply defined as the behaviours that support an organization's safety program and regulations (Kapp & Parboteeah, 2008). This behaviour is used to describe important tasks that need to be carried out by individuals or employees to maintain safety at workplace (Neal & Griffin, 2002). Besides, safety participation also involves activities like helping co-workers, promoting safety program within workplace, demonstrating initiative and pouring some efforts towards safety improvement at workplace (Neal et al., 2000).

As stated in OSHA 1994 section 24, the duties of employees are as follow:

i. Take reasonable care for the safety and health of himself and of others;

ii. Cooperate with employer or another person;

iii. Wear at all times any Personal Protective Equipment (PPE) or clothing provided;

iv. Comply with any instruction or measure on Occupational Safety health

The requirement stated in OSHA 1994 emphasizes the requirement of employers towards safety participation at place of work. Yet, the safety regulations are taken for granted and most workers would disobey them. Hence, the management have no choice but to have a strict policy on safety regulations with severe punishment or demerit for those who are unwilling to follow them.

These behaviours do not directly contribute to the employee's safety, yet helps to promote a safe environment. However, safety behaviour shows a paradox to practitioners and researchers similarly as, contrary to the assumption that self-preservation overrides other motives, careless behaviour prevails during many routine jobs, making safe behaviour an ongoing managerial challenge (Zohar & Luria, 2003). Zohar in his research highlighted that this paradox could be explained away by the incorporation of known learning principles and cognitive biases, with the assumption that behaviour is guided by the principle of maximizing expected utility (Dov, 2008).

Working in a safe manner often entails working at a slower pace, investing extra effort, or operating under less-comfortable conditions. When safety rules are ignored, then incidents may occur due to risky behaviours (Griffin & Neal, 2000). Consequently, whenever work pressure increases, employees use a complex system of considerations to set the relative priorities for safety versus speed or productivity. This is when the safety behaviour is ignored, hence increasing chances of accidents to occur at workplace. Safety information to employees represents an organization's planned effort to improve employees' current and future safety performance by increasing their self-efficacy and increasing their attention toward safety (Katz-Navon et al., 2007). In Motorola Solutions, as

mentioned in Figure 2.2, besides undergoing security verification before entering construction site, the workers are required to wear the PPE as mentioned during the NCO training regardless of any situation. The contractor will be educated on the policies and requirements through safety briefing before starting work at site. This requirement is strictly followed by Motorola Solutions. Those without proper documentation and compliance will not be allowed to enter the construction site.

One way to ensure compliance is through site inspection. This would in evidently improve the safety participation and compliance among the workers there. Besides, during tender briefing, the contractors are notified on the safety guidelines that need to be followed by contractors. Moreover, all contractors are required to attend the safety training course at the National Institute of Occupational Safety and Health in order to qualify them to be selected as contractor at Motorola Inc., at the same time to boost their knowledge on safety requirements and practices.

2.2.3 Instrument & Measurement Safety Performance

The root cause of major industry disasters in the past can be traced back to the weakness in the safety management system (Kapp & Parboteeah, 2008). Conventional measurements are proving to be unreliable indicators of the future and can cause contracts to go to bidders with the highest, not lowest, probability of accidents (Veley et al., 2004). In general, organizations have multiple goals and means of attaining goals, hence, senior managers must improvise the policies and procedures for key organizational facets. Job hazard analysis or HIRARC can be conducted to identify the potential hazards and implement required control

measures to curb accidents. Assessment of such policies, procedures and practices can be quite complex. They require various information for the establishment of differences between formally declared policies and procedures and its enforced counter-parts (Dov, 2008).

One of the most famous and easy to understand accident causation models is the Swiss-cheese model, which was created by James Reason (1997). One side indicates a specific hazard, for example chemical hazard, while the other side representing potential loss of some kind, for example loss of human life. Between the hazard and the potential loss there are numerous defence barriers, illustrated as Swiss-cheese slices. Deficiencies in a barrier, latent conditions, are illustrated as holes in the slices. If all the holes are lined up, as illustrated in Figure 2.3, an accident could happen. Latent conditions in an organization may be due to poor design, gaps in supervision and unworkable procedures, in which arise from decisions at management levels (Nevhage & Lindahl, 2008).

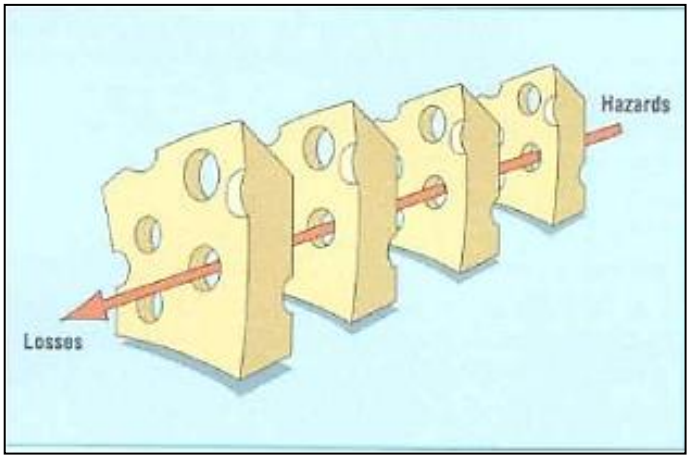


Figure 2.3
The Swiss-Cheese model illustrating on the hazards and potential loses (Reason, 1997)

Since safety performance had become a major requirement in measuring a supplier's or contractors' qualification, more efforts had been poured in selecting the suppliers or contractors with the lowest probability of having future accidents. Traditionally, safety performance is measured based on the frequency and severity of accident occurring at the place of work (Veley et al., 2004). However, this method is deemed unreliable in forecasting the future. Thus, several measurement that are reliable and currently being practiced at various companies are OSHA recordkeeping, lost time measure, Days Away From Work Case (DAFWC) frequency and Total Recordable Injury Rate (TRIR) (Veley et al., 2004; Zohar, 2011).

2.3 Safety Climate

A safe and healthy working environment is an essential element of work life quality. In the past few decades, several researchers studies to determine the effects of safety climate on employees' occupational safety behaviours' and work injuries in a range of industrial settings had been driven tremendously (Fugas et al., 2012). The terms "safety culture" and "safety climate" have been used interchangeably in various literature in studying the attributes of employees towards a safe work environment. The concept of 'safety culture' has been developed since the OECD Nuclear Agency (1987) studied that the errors and violations of operating procedures occurring before the Chernobyl disaster were evidence of a poor safety culture at the plant and within the former Soviet nuclear industry. On the other hand, Cox and Flin in their study in 1998 stated that safety climate a manifestation of safety culture in the behaviour and attitude of employees at workplace (Dollard & Bakker, 2010; Flin et al., 2000)

2.3.1 Definition of Safety Climate

Safety climate is a specific form of organizational climate, defined as "shared perceptions about organizational values, norms, beliefs, practices and procedures" (Guldenmund, 2000). Organizational climate is termed as multi-dimensional linkages that encompass a range of individual evaluations namely leadership, roles, and communication, of the work environment. On the other hand, safety climates over time collectively make up the organization's safety culture. Zohar had defined safety climate as "the coherent set of perceptions and expectations that employees have regarding safety in their organization" (Zohar & Luria, 2003). Neal and Griffin in their study identified safety climate as the "perceptions of policies, procedures and practices and relating to safety in workplace". All types of climate are based on employees' perceptions of the practices, procedures, and rewards in the organization (Griffin & Neal, 2000).

2.3.2 Dimension of Safety Climate

Safety climate studies can provide information of organizational safety as it is perceived by the members of the organization, namely the employees. This information is useful in improving the existing safety management system to address findings from safety climate studies (Hall, 2006). Dimensions refers to the elements or factors of safety climate emerge as predictors of unsafe behaviour or accidents to occur (Mearns, Whitaker, & Flin, 2003). There are different dimensions in the safety climate studies that have been done by various researchers over the years. Table 2.1 summarizes some of the safety climate dimension studied over the years.

For this research, there are several safety climate dimensions that are studied to analyse the safety performance among construction workers in Motorola Penang. They are management safety practices, supervisor safety practice, safety attitude, safety training, job safety and co-worker safety practices.

Table 2.1
Dimensions of safety climate in previous studies (Azimah et al., 2009)

Researchers	Safety climate dimensions
Brown & Holmes (1986)	Management concern, management activity, risk perception
Budworth (1997)	Management commitment, supervisor support, safety systems, safety attitudes, safety representatives
Cheyne et al. (2002)	Communication, individual responsibility, safety standards and goals, personal involvement, workplace hazards, physical work environment
Cooper (1995)	Management commitment, management actions, personal safety commitment, perceived risk levels, effects of work pace, belief about accident causation, effects of job induced stress, safety communication, emergency procedures, safety training, and role of safety representatives
Cox & Cheyne (2000)	Management commitment, priority of safety, communication, safety rules, supportive environment, involvement in safety, personal priorities and need for safety, personal appreciation of risk, work environment
Cox & Cox (1991)	Personal scepticism, individual responsibility, work environment, safety arrangements, personal immunity
Dedobbeleer & Beland (1991)	Management commitment, worker involvement
Salminen & Seppala (2005)	Organizational responsibility, workers' concern about safety, workers' indifference in regard to safety, and the level of safety actions
Hsu et al. (2007)	Organizational level: top management commitment, reward system, reporting system, and resource allocation; management level: safety training, safety activities, safety management; team level: communication, coordination, cooperation in a work team; individual level: safety

	performance such as safety awareness, safety attitude and safety behaviour
Huang et al. (2006)	Management commitment, return-to-work policies, post-injury administration, safety training
Williamson et al. (1997)	Personal motivation for safe behaviour, positive safety practice, risk justification, fatalism/optimism
Zohar (1980)	Importance of safety training programs, management attitudes toward safety, effects of safe conduct on promotion, level of risk at workplace, effects of required work pace on safety, status of safety officer, effects of safe conduct on social status, status of safety committee

2.3.2.1 Management safety practices

This dimension refers to company safety policies enforcement and practices that are carried out in the company. A report by the UK Advisory Committee on the Safety of Nuclear Installations broadly defined safety culture as "the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization's health and safety management (a. Neal et al., 2000). The OSHA regulations section 17 also highlighted the role of the employer or management in providing a safe work place in order to reduce occupational related risks. Therefore, management safety practice plays a vital role in ensuring a safe workplace. In Motorola Penang, the construction worker must practice the EHS policies as briefed during the NCO orientation done on the new contractors and workers upon appointment. The construction workers and other employees who wants to enter the construction site are to obey the safety rules and regulations in terms of PPE utilization and instructions.

Managers and management level executives depicts their commitment towards safety practices through their knowledge on the existing problems, conviction that the organization is able to achieve safety at the utmost level, ability to achieve a lasting positive attitude towards safety at the same time their ability to promote a safe working environment actively at all levels of organizations. The safety culture in an organization would also comprise of the management level practices and attributes, as illustrated in Figure 2.5. Nevertheless, the managements' decision gives an impact on the employees attitude and safe work behaviours (Nevhage & Lindahl, 2008; Froko et al., 2015)

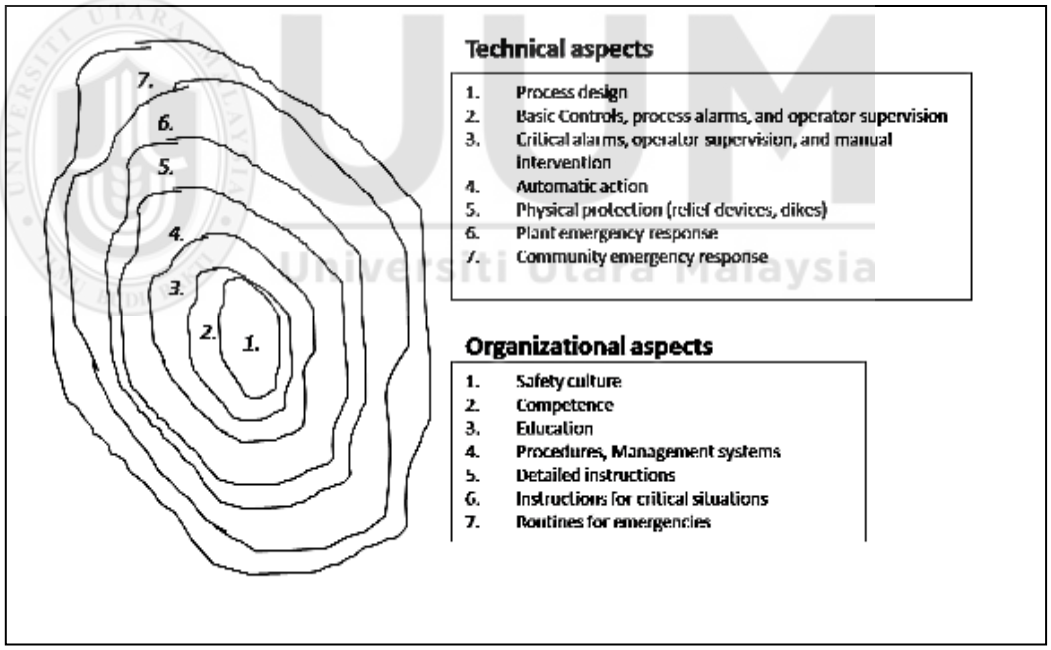


Figure 2.4
Organizational level safety climate model (Jacobsson, 2001)

2.3.2.2 Supervisory safety practices

Supervisors play a primary role in influencing subordinate behaviour. This is because effective line supervisors continually provide the antecedents and consequences employed in behavioural safety interventions for example; they monitor work in progress and act accordingly, providing positive or negative consequences depending on observation outcomes. Such practice clearly shows supervisory directives, expectations and behaviour outcome consequences in preventing accidents from occurring at workplace. Supervisory practices may influence the employees' perceptions of organizational policies, practices, and procedures (A. Neal & Griffin, 2006) The contractors act as the supervisors in maintaining safe workplace at the construction site and responsible to his/her workers well-being (Zohar & Luria, 2003). Nevertheless, the project manager is responsible for the overall construction site issues and management, including safety issues.

2.3.2.3 Safety attitude

Behavioural safety research in the past had focused on either individual differences or contextual factors, but only occasionally on both. Safety attitude or behaviour at workplace had been proven one of the root causes if there is an accident at workplace. Negligence of the employees or sometimes the management, may lead to accident at workplace. The immediate costs of safe behaviour or safety attitude, such as slower pace, extra effort, or personal discomfort, are given greater weight than low probability threats, resulting in a situation where the expected utility of unsafe behaviour exceeds that of safe

behaviour (Nor Hidayah & Siti Fatimah, 2013; Zohar & Luria, 2003). The safety attitude can also be referenced in OSHA act Section 24 on the compliance and regulations that the employee needs to follow at the place of work. The attitude towards a safe working culture is highly encouraged by their employers in order to eliminate any occupational accidents, and further improving the safety performance of the work environment.

2.3.2.4 Safety training

Based on previous studies, safety training is a dimension that is considered as an individual factor that drives the safety climate that affects safety performance in companies and organizations. Safety training improves behavioural skills, related knowledge and attitudes. Safety training does not mean that accident more predictable, yet a systematic and comprehensive safety, health and quality system is vital in improving the level of safety and health of all employees. Training on safety is also mentioned in OSHA act Part V, section 15, whereby an employer should ensure the employees receive training and awareness on occupational safety as far as it is practicable at the place of work. Previous studies also prove that companies with lower accident rates are characterized as those with good safety training for the employees. Nevertheless, the employees involvement is also vital in pertaining the success of the safety training being provided by the management to the employees (Vinodkumar & Bhasi, 2010)

2.3.2.5 Job safety

Job safety is one of the dimensions of the safety climate whereby, the construction workers are exposed to. Generally, the construction site is exposed to various forms of safety hazards. Negligence at work gives a high probability for accidents to occur. The safety training and safety practices at workplace are designed based on the type of work by the employees and the probable hazards they might be exposed to (Lu & Tsai, 2008). Job safety is largely dependent on the employees themselves whether to follow or otherwise of the safety regulation set by the management. An individuals' motivation and attitude influences the working culture of the employees. For example, telling people to "be careful" is good advice, but by itself that does nothing to reduce chances of accidents. Telling an employee with burned fingers to "Never touch that thing," is good advice, but useless because burned fingers have already made that impression (Veley et al., 2004). By following the quotes "prevention is better than cure", job safety relies on the employee's perception on job prospect and the practice of safety policies and preventive measures.

2.3.2.6 Co-workers safety practice

Co-workers or peers at work are the biggest influence that may or may not instil safety behaviour in an individual. Co-workers play a vital role in creating a safe work environment. Humans are easily influenced psychologically by other's behaviour. Hence, proper implementation of safety policies that are not troublesome to the employees may help to improve the safety at workspace environment. Employees become well educated on the possible consequences of

safe or unsafe behaviours by paying attention to overt statements and actions by managers, supervisors and co-workers regarding safety as well as important messages from management about the relative status of safety compared to other organisational goals such as productivity, efficiency, schedule, service, and quality. Thus, the co-workers have a mutual understanding on the safety policies, therefore will result a chain reaction within the work place (Mearns & Yule, 2009). The safety-climate perceptions must refer to those policy attributes that best indicate the true priority of safety. This would ensure easy practice at workplace (Dov, 2008). Moreover, the co-workers may help each other by advising to practice safe workplace ethics.

2.3.3 Instrument & Measurement of Safety Climate

The basic construct of safety behaviour consists of: identifying behaviours' that impact safety; defining these behaviours so that they reliable when measured; development of system to measure these behaviours in order to produce a "safety climate"; be able to provide feedback to employee on the behaviour status; and hence to encourage progress (Hall, 2006). Currently, predictive measures are used as tool in measuring safety climate to enable a better safety condition monitoring, which reduce the need to wait for the system to fail, to identify the root cause and take counter measures (Flin et al., 2000). Several instruments exist for the purpose of measuring safety climate which are collection of response items that intend to measure organizational climate and safety climate. In 1988, Ojanean and team suggested measuring safety climates can indicate the changes in organizational safety behaviour and thus, useful in evaluating safety programs (Glendon & Litherland, 2001).

Methodologically, a multi climate framework suggests that measures of safety climate ought to include items that refer to situations presenting competing operational demands involving safety because such situations offer the clearest indication of priorities at the construction site. Measurement sensitivity can be further enhanced by the inclusion of industry-specific items. As for construction site, utilization of PPE and proper job training highly influences the measurement of safety climate. Therefore, safety-climate measures may include the following item types:

i. Unmediated assessment of managerial commitment, or priorities,

ii. Mediated assessment through universal indicators; and

iii. Assessment based on industry-specific indicators.

The most effective media for the listed assessment is via questionnaire survey on the construction site workers. By administering a questionnaire survey, the valid items crucial for the research or study can be obtained by the respondents (Shang & Lu, 2009). Sampling is vital to limit the variance in responses that may arise as a result from the survey.

2.4 Studies on the Influence Safety Climate on Safety Performance

Research on safety climate began in early 1980s whereby, Zohar (1980) mainly addressed the role of management, rather than the worker, affects safety practice in organizations. Guastello and co-workers applied the non-linear dynamic catastrophe model, to include individual characteristics to study the occurrence of occupational accidents and stress-related medical disorders in

different work environment (Siu et al., 2004). In recent years, the booming interest in research looking at mediators in safety research, such as personal characteristics, attitudinal variables and contextual variables using structural equation modelling to establish a theoretical framework linking safety climate and safety performance.

As a dependent variable, safety performance has been measured through a range of safety outcomes like accident rates, safety behaviour and safety involvement (Clissold, 2005). Through the application of structural equation modelling, research conducted by Tomás et al. (1999) resulted in further support for the relationship between safety climate and accidents, while Neal et al. (2000) confirmed the relationship between safety climate and safety participation. On the other hand, Cheyne et al. (1998; 2002) tested and confirmed a framework of safety climate factors, while also achieving support for the relationship between safety climate factors and participation in safety activities. Thus a hypothesis can be constructed; Safety climate will predict safety performance (Tharaldsen et al., 2010).

In another study, well documented safety rules and procedures and its enforcement by supervisors and managers can improve safety behaviour among workers. Glendon and Litherland (2001) reported this as an important factor after analysing the data collected from construction workers via a questionnaire survey. Cox and Cheyne (2000) and Mearns et al. (2003) included safety rules and procedures as a factor in their offshore safety studies and showed that it has significant correlation with accident rates. This proves that the safety practices and procedures at the work place, management and supervisory level safety

practices contributes positively in managing a safe work culture in an organization (Vinodkumar & Bhasi, 2010) Therefore, the safety climate whereby, the construction workers are exposed would give an adverse impact on the safety performance at the construction site.

2.5 Conclusion

It cannot be denied that the construction workers are exposed to various hazards at the place of work. The implementation of safety practice and policies are measures taken to prevent accidents from occurring at the construction site. Nevertheless, the workers are exposed to various dimensions of safety climate that affects the work progress at the same time the safety performance at construction site. Even though no much studies were done in analysing the multi-climate framework that influences the safety performance of construction workers, an effective assessment method by survey questionnaire can expose the probable climate whereby the target group are exposed to.

CHAPTER 3

METHODOLOGY

3.1 Introduction

In this chapter, the methods and the mainframe of the overall research project is elaborated. The methodology chosen is aimed to achieve the objectives of this project. This study seeks to investigate on the dimensions of the safety climate that influences the safety performance among construction workers in Motorola Solutions Penang. The dimensions of safety climate that are stressed are management safety practices, supervisory safety practices, safety attitude, safety training, job safety and also co-worker's safety practices. The processes involved in this project namely preliminary studies; data collection, sampling methods and also data analysis are mentioned in this chapter.

3.2 Research Framework

Based on the literature review and the hypotheses proposed for this project, the conceptual research framework is illustrated as in Figure 3.1. The safety climate dimensions, playing the role as the independent variable influence the safety performance, which is the dependant variable. As mentioned earlier, the six dimensions of safety climate are: management safety practices, supervisory safety practices, safety attitude, safety training, job safety and finally, co-worker's safety practices. On the other hand, the dependant variables are safety compliances and safety participation.

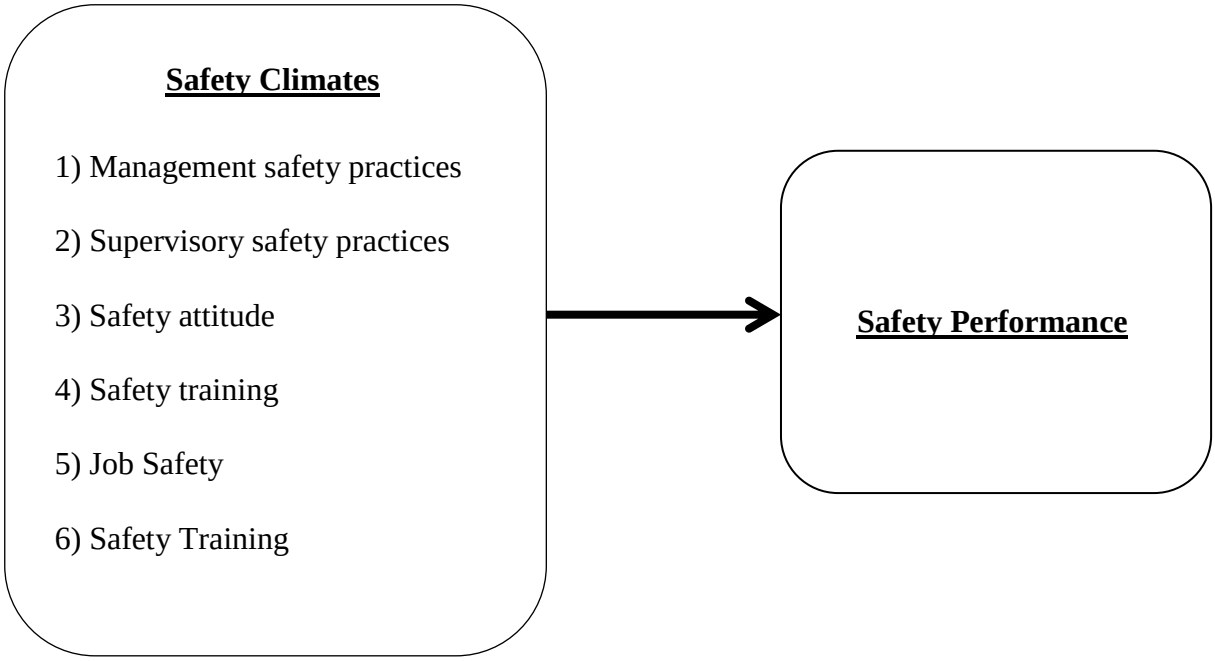


Figure 3.1
Conceptual Research Framework

3.3 Research Hypotheses

From the project framework, 7 hypotheses are acquired and drafted for this research project based on the research objectives. Generally, hypothesis is a statement on the relationship between two or more variables. A hypothesis must include the variables, the population and the relationship between the variables. The population here refers to the entire group of individuals or elements who met the sampling criteria. Hypothesis generally translates research question into a prediction of expected results, and hence used as a tool of quantitative studies to expedite the outcomes. The hypotheses for this research are listed as follow:

i. Hypothesis 1 (H1): There is a significant relationship between the management safety practices and safety performance

ii. Hypothesis 2 (H2): There is a significant relationship between the supervisory safety practices and safety performance

iii. Hypothesis 3 (H3): There is a significant relationship between safety attitude and safety performance

iv. Hypothesis 4 (H4): These is a significant relationship between safety training and safety performance

v. Hypothesis 5 (H5): There is a significant relationship between job safety and safety performance

vi. Hypothesis 6 (H6): There is a significant relationship between co-worker's safety practice and safety performance

vii. Hypothesis 7 (H7): There is a significant influence of safety climate dimensions on safety performance.

3.4 Research Design

The research design is defined as the overall strategy of the researcher to integrate the different components of the study both, coherently and logically. Hence the proper identification of the research problem would constitute to the overall blueprint for the collection, measurement and analysis of the data. Research design plays a role in ensuring the data obtained from the study enables to address the research problem logically and as unambiguous as possible. Hence, the length and complexity of describing research designs should achieve the following aspects:

i. Identify the research problem clearly and justify its selection, particularly in relation to any valid alternative designs that could have been used,

ii. Review and synthesize previously published literature associated with the problem,

iii. Clearly and explicitly specify hypotheses central to the research problem,

iv. Effectively describe the data which will be necessary for an adequate testing of the hypotheses and explain how such data will be obtained, and

v. Describe the methods of analysis to be applied to the data in determining if the hypotheses are true or false.

3.5 Operational Definition

i. Safety Performance

Core safety behaviours are central to health and safety. These behaviours are performed in almost all jobs, and consist of using protective equipment, engaging in work practices to reduce risk, communicating health and safety information, and exercising employee rights and responsibilities (Vinodkumar & Bhasi, 2010).

ii. Safety Compliance

Safety compliance is defined as the core activities that individuals need to perform to maintain safe workplace. Some of the behaviours include adhering to standard work procedures and wearing personal protective equipment (Neal & Griffin, 2006)

iii. Safety Participation

Safety participation is termed as the behaviours that do not directly contribute to an individual's personal safety yet helps to develop a safe environment. These behaviours include routines like participating in voluntary safety activities, helping co-workers with safety-related issues, and attending safety meetings (Neal & Griffin, 2006). Safety participation has a more voluntary and discrete in nature, which includes practices oriented toward safety besides normal role requirements (Fugas et al., 2012)

iv. Management Safety Practices

Management safety practices are safety policies and enforcements that are practiced in the company. In other words, a management safety practice relates to the actual practices, roles and functions related to a safe environment. Usually it is an organization's sub-system management and is carried out through the organization's safety management system with the help of various safety management practices (Vinodkumar & Bhasi, 2010).

v. Supervisory Safety Practices

Supervisors acts as a role model in developing safety ethics and practices at workplace. For construction sites, contractors play a vital role in ensuring safety practice are followed and practiced, at the same time to uphold company safety enforcements. Supervisors may also engage in acts of verbal persuasion that are conducive to self-efficacy formulation among the workers. Supervisors

set the tone and tempo for safety, like emphasizing safety behaviours at place of work (Seibokaite & Endriulaitiene, 2012)

vi. Safety Attitude

Safety attitude refers to the perception and behaviour of a person towards creating a safe environment to him/her and also others. Poor safety attitude among the workers, namely construction works in this study would create an implicit assumption that relates to the failure of safety compliance at workplace (Azimah et al., 2009; Neal & Griffin, 2006).

vii. Safety Training

Safety training are the activities done within the organization by applying its safety management systems to enhance the knowledge on safety practices at work place and engage in a learning process of the probable hazards the workers might be exposed to at the place of work and measures to avoid accidents. Nevertheless, the key element to a successful accident prevention or occupational safety and health programme is an effective safety training (Vinodkumar & Bhasi, 2010)

viii. Job Safety

Job safety refers to the level of safety measures a worker should take based on the probable hazards they are exposed to. Every job has its own safety hazards. Hence, all measures must be taken to create a safe work environment. Job safety is also align with the OSHA 1994 main objectives in order to uphold a

safe working condition regardless of level of skill, knowledge and experience of the worker (Fugas et al., 2012; Shang & Lu, 2009).

ix. Co-Workers Safety Practices

Co-workers or colleague's safety practices refer to the individuals in practicing behaviour that promotes a safe environment for them. The co-worker safety practices focused on the perception of a worker to practice safety regulations at workplace that will promote safe work ethics to another worker (Lu & Tsai, 2008).

3.6 Research Instrumentation

The questionnaire survey is used as the tool to collect the data from the respondents. The content validity of questionnaire items used in this study was confirmed through a literature review and interviews with practitioners; in other words, questionnaire questions were based on previous studies (Lu & Tsai, 2008). This questionnaire survey form is adapted from the works of Lu and Tsai (2008), Hall (2006) and Neal and Griffin (2006). These questions were reworded and rephrased to suit local working practices and culture. Each question was a complete narrative statement. Based on their actual experience and feeling, the respondents rate each question in the survey form. The questionnaire comprises of 9 parts with a total of 62 closed response questions using the nominal scale for respondent's demographic data and Likert scale (1 – Strongly disagree, 2- Disagree, 3- Unsure, 4-Agree, 5- Strongly Agree) for all the variables studied in this research. The questions are designed in accordance to reversed-scored layout (Harun, 2014).

i. Safety climate scale:

This scale was made up of 6 dimensions and is measured with 6 subscales measuring the construction workers' management safety practices, supervisory safety practices, safety attitude, safety training, job safety and safety training.

ii. Safety performance scale:

This scale consists of two dimensions: Safety compliance and safety participation and is measured on two subscales.

3.7 Data Collection

In this research studies, premier data is used. According to Sekaran (2000), premier data are those obtained from the various variables used in the study of a research (Harun, 2014). To obtain the data, the survey forms are distributed to the contractors who are hired for the construction works at Motorola Penang to be distributed to the construction workers and also the safety department executives and officers dealing with this construction project. Clear instructions are stated in the survey form for the respondents, with ample of time given to fulfil the form without any form of force and pressure to the respondents. The psychological factor of the respondents plays an important part in the type of response given to the structure questions. The surveys forms are collected back form the respondents upon completion. The data obtained is analysed for further discussion.

3.8 Population

The target group for this study is mainly the construction workers who are involved in the construction works in Motorola Penang directly. Besides, the targeted group also includes the officers: contractors and safety officers or supervisors, as well as the executives working in this project. The survey population size is limited to respondents of mentioned work classifications. A total of 80 workers involved in this construction works.

3.9 Sampling

Sampling is a process of selecting the appropriate elements or groups in a population that will fulfil all criteria needed in the targeted population whilst obtaining the variance in response based on the difference in knowledge and skills area. Sampling is an effective way to obtain the data required as it will minimize probable errors especially, when large number of target group is selected.

For this study, the target group chosen around 80 construction workers at Motorola Penang, which includes the supervisor and executive level employees involved in the construction process. The idea is to collect the primary data from a wider population that will provide a more balanced perspective.

In addition to the literature references, based on Krejcie and Morgan (1970) table, the number of samples should not be less than 66. However, only 67 questionnaires were responded, despite many verbal remainders through the construction supervisor. 6 responses were found to be ambiguous and were left out from the final number of the valid responses.

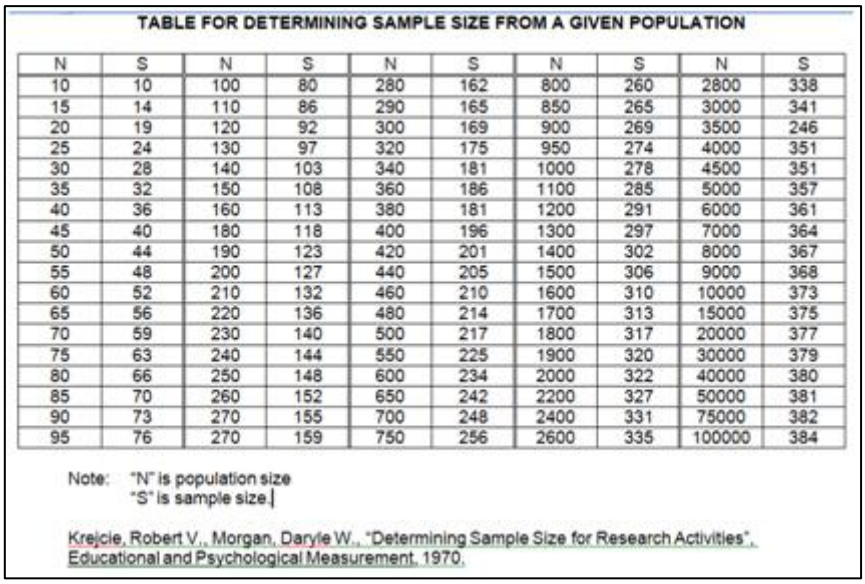


TABLE FOR DETERMINING SAMPLE SIZE FROM A GIVEN POPULATION

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Krejcie, Robert V., Morgan, Daryle W., "Determining Sample Size for Research Activities", Educational and Psychological Measurement, 1970.

Figure 3.2
Sample size determination based on population (Krejcie and Morgan, 1970)

3.10 Data Collection Techniques

Random sampling technique is used in this study to examine on the relationship between the independent and dependent variables and concurrently giving an equal chance of sampling within the population. A questionnaire survey is conducted and distributed within the population, and then a sampling of 61 respondents is chosen for data analysis. Nevertheless, this method is time consuming and largely influenced by the respondents state of mind while answering the questionnaire (Harun, 2014).

Descriptive statistics and exploratory factor analysis were used to reduce the safety climate attributes in order to manage sets of underlying dimensions in this research. ANOVA analysis was also used to evaluate the relationship between safety climate, safety performance and also the respondents' characteristics. In

order to analyse and measure the safety climate influence on the safety performance, each question was categorized and contain the key dimensions.

3.11 Data Analysis Techniques

The data gathered from the questionnaire survey is analysed using Statistical Package for Social Science version 19 (SPSS) software. The data gathered are studied using Descriptive analysis, Reliability analysis, Pearson Correlation Test and Multiple Regression test (Harun, 2014).

Descriptive statistics like percentage, means, standard deviations, maximum and minimum values for each variable were obtained and analysed. The computed frequencies are to analyse the respondents' profile in terms of gender, age, nationality and professional tenure. On the other hand, reliability test is performed on independent variables and dependent variables to ensure the reliability and internal consistency of the variable grouping (Munusamy, 2008). In other words, reliability test can determine the level of reliability and validity of the instruments used, at the same time to ensure the study is able to be carried out.

Pearson correlation test is an analysis used to correlate both the dependent and independent variables. The significance of the independent variable onto the dependent variable could be studied using this analysis method. Finally, Multiple Regression method is used to analyse the intensity of the relation between the two type variables. Through this analysis, the safety climate which gives the most significance to the safety performance can be identified.

3.12 Preliminary Studies

A preliminary study with a total of 30 respondents was carried out prior the actual survey. The main objective of this preliminary study is to determine the reliability of this study and the instruments used to obtain the data. Besides, the survey form is bilingual to ensure the validity and reliability of the tool used. This ensures the response obtained from the sample group is valid and trustworthy to be used for the actual study group.

Initially, a total of 78 Likert-type questions were prepared in accordance to the matter of study for this pilot study, in addition to safety expert evaluation and feedback on the questionnaire. Based on the feedback, the items that were not appropriate, redundant to the study and confusing were removed. Certain questions in the original survey script were altered as the dimensions were not clear and too long. Moreover, the items were redefined to eliminate related items across the 8 categories in the questionnaire form. Upon redefining the questionnaire, the total number of questions is 57. The overall items being removed is 27% i.e. 21 questions out of 78 questions, with 6 questions (8%) were relocated to other factors to ensure the suitability of the question to fit to the category.

3.13 Conclusion

Chapter 3 revolves on the technical aspects of the research studies namely, study instruments and statistical tools used in this study. Based on this study, the empirical relationship between the 6 safety climate dimensions and 2 safety

performance dimensions serves as the outcome variables. All constructs are demonstrated and accepted are with an acceptable internal consistency. Besides, a thorough and wide explanation on the variables and mode of research instruments is included in this chapter

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter comprise of the overall data collection interpretation, data analysis and discussion on the data collected using SPSS. In SPSS, the data is analysed using Reliability Analysis; Pearson Correlation Test to determine the relationship between the independent variables, Multiple Regression Test to analyse and test the degree of significance of the independent variable on the fixed variable, and Descriptive Analysis to further elaborate on the demographic data of the respondents, with the mean and standard deviation of all the tested variable.

4.1.1 Early Stage Screening

The method used for gathering data is via survey form. A set of 78 Likert-type items were compiled into a survey for a pilot study among the target group. This set of questions was also subjected for an evaluation by academician in this related field of study. The main purpose is to remove some items that are deemed as inappropriate, redundant and misleading, and those with very low correlation between the variable. Besides, through this pilot test and evaluation, the items that are perceived clear are further improved to allow a better interpretation and co-relation of the variables. Moreover, the review also gave a measure whether the full theme of the study topic is implied on the survey questions. On other words, items that are not suitable are removed and those which are suitable but give a

vague interpretation are modified. From the original 78 items, 57 items were utilized in the final draft of the questionnaire. Total of 26.9 % items removed and 7.7% items were modified as a result of evaluation by the academician.

4.1.2 Questionnaire Response

Random sampling method is used for this questionnaire survey to gather the necessary data needed in relation to the research study on the target group, construction workers at Motorola Penang. This survey was conducted via simple random sampling on the target group. Total of 80 questionnaires were distributed in the sample, with a total of 67 forms returned. Out of those 67 forms, only 61 response forms could be used to further analyse the data for this research study.

Only questionnaires returned which is completely filled were included in the compilation of the results. The data collected through the background questions and the 57 items were analysed by using IBM SPSS Statistics (version 19) and Microsoft Office Excel (2010). The raw data from the items were used to calculate mean scores for each dimension and individual. Only answered items were used in the calculations.

Table 4.1
Questionnaire form collection data form target group

Survey Form Response	Frequency, *f*	Percentage (%)
Total number of distributed forms	80	100.00
Total number of returned forms	67	83.43
Total number of used forms	61	76.25

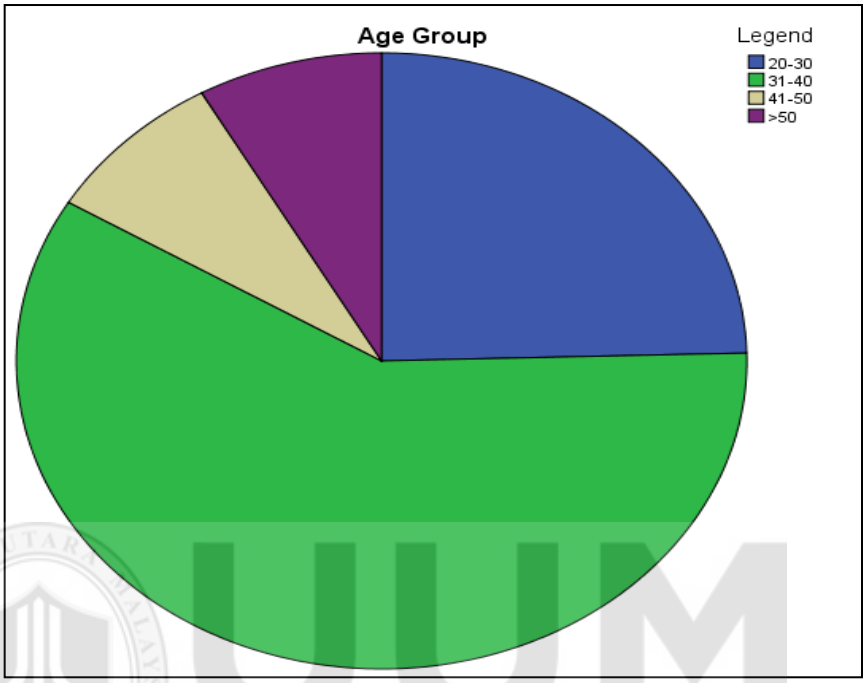
4.1.3 Participants' Demographics

From the questionnaire outcome, most of the respondents were middle aged, between 31 to 40 years old (59.0%). In regard of the gender, male respondents were the majority participant in this questionnaire survey study with a total percentage of 93.4% compared to female respondents.

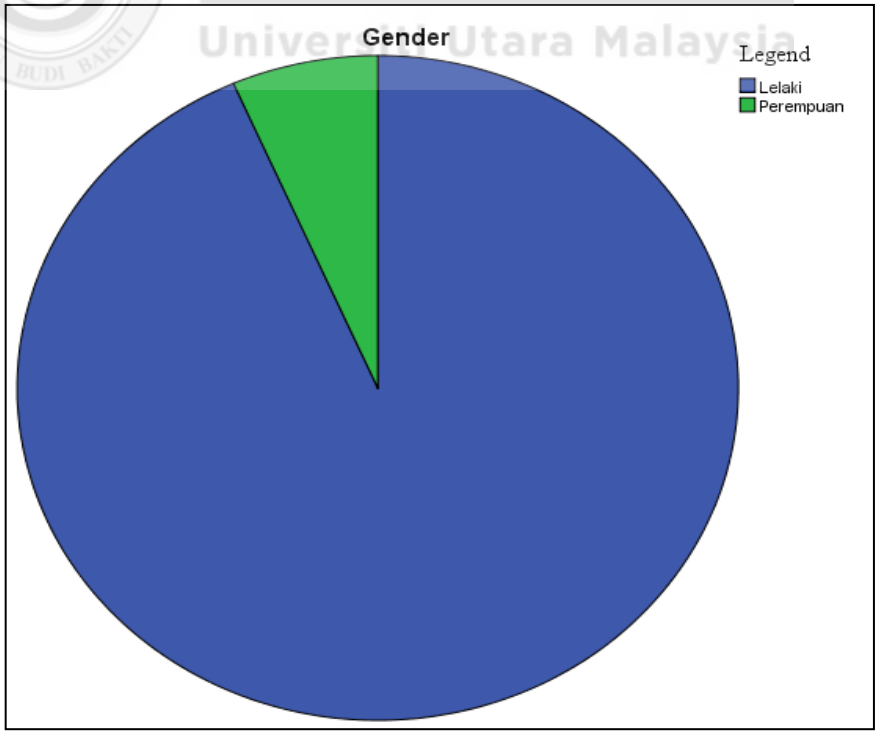
On the other hand, in terms of nationality, majority of the respondents are Malaysians with a percentage of 70.5% compared to non-Malaysian participants. This could also be linked to the majority of the survey participants were the contractors (45.9%) and executives (13.1%), whilst the non-Malaysian respondents were mainly working as general workers (39.3%) Table 4.2 summarizes the respondents' profiles and the data illustrated in diagram 4.1.

In short, the nature of the sample group could be seen through the demographic profile of all respondents, mainly targeting on the age group, as well as the job scope. This target group are indeed suitable to the survey study. In summary, the contractors and general workers are targeted for this study. With a

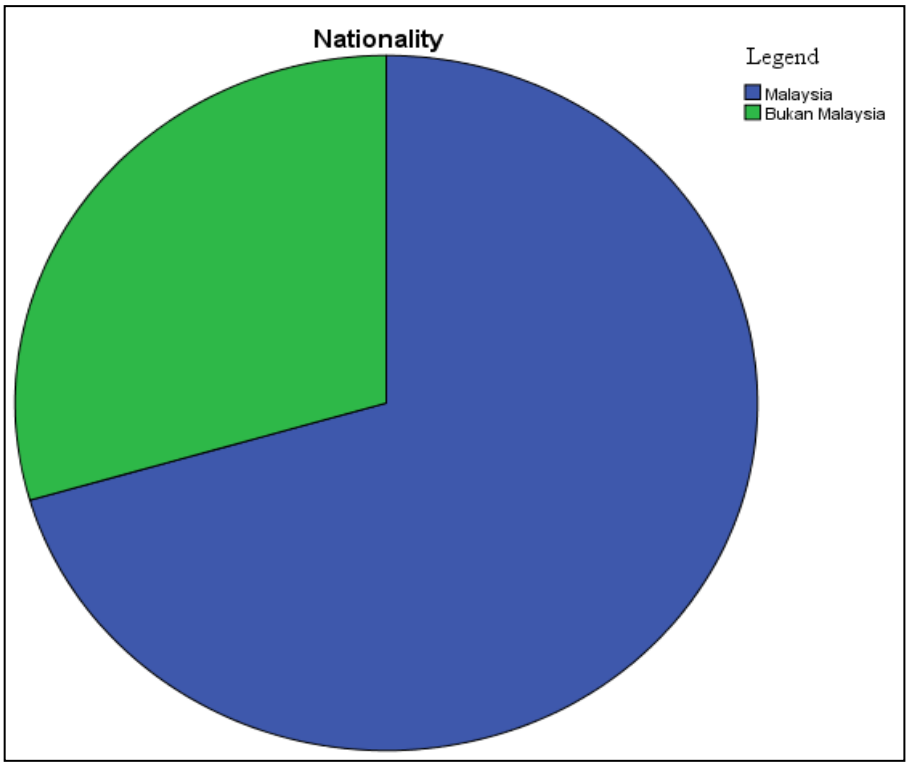
large number of 61 valid respondents, the objective of this survey to analyse the data were achieved. Nevertheless, the demographic profile also represents the overall population of the construction work site at Motorola Penang.



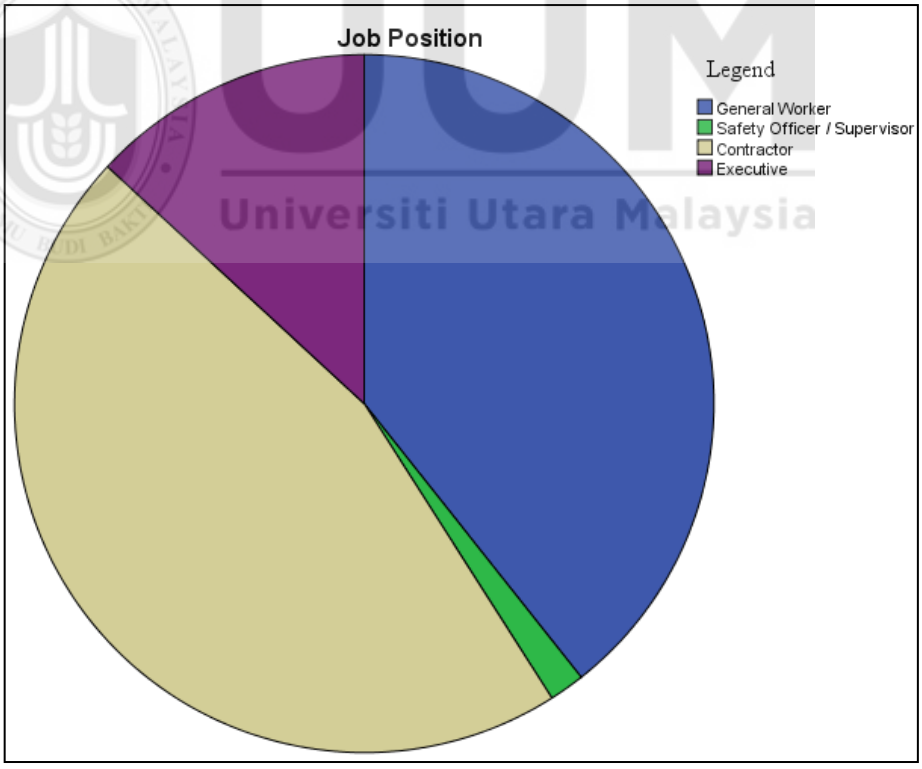
(a)



(b)



(c)



(d)

Figure 4.1

Pie chart representing the demographic profiles of the by categories (a) Age group; (b) Gender; (c) Nationality; and (d) Job Position

Table 4.2
Demographic profile of survey respondents (n =61)

Characteristics		Frequency	Percentage (%)
Age	20 – 30	15	24.6
	31 – 40	36	59.0
	41 – 50	5	8.2
	>50	5	8.2
Gender	Male	57	93.4
	Female	4	6.6
Nationality	Malaysian	43	70.5
	Non-Malaysian	18	29.5
Job Position	General Worker	24	39.3
	Safety Officer/ Supervisor	1	1.6
	Contractor	28	45.9
	Executive	8	13.1

4.2 Analysis of Data

Utilizing the Statistical package for the Social Sciences (SPSS), the data obtained from the survey questionnaire were analysed to evaluate the safety climate factorial structure for each distribution. A second order factor analysis of the scales was conducted. The overall reliability of the measure for both distributions of dependent and independent variables was also assessed using Cronbach's Alpha.

4.2.1 Research Variables

Random sampling method was chosen to gather information on the research topic to enable more dispersed views from the sample from the target population. It is proven that via random sampling, and error of 5% could be eliminated when gathering the data through questionnaire survey. An estimation of 60% return rate from the overall sampling would be suffice to gather the data and analyse all research variables (Wu et al., 2008). Standard deviation obtained from the data gathered would explain on the dispersion of the response from the mean value and also reveal the most significant data.

Table 4.3 summarizes the data of the mean value for all independent variables towards the dependent variables. Independent variables are safety climate while dependent variables are safety performance, which comprise of safety compliance (Item H48 – H52) and safety participation (Item I53-I57). In a whole, the mean value for all the independent variables are in the range of 2.62 (Safety Attitude) and 3.90 (Supervisory Safety Practices). The mean data value shows a small range between all variables, giving a perception on all safety climates being measured in this study, whereby all the variables are almost equally significant in affecting the dependant variable, Safety Performance. 5 safety climates; Management Practices, Supervisory Safety Practices, Safety Training, Job Safety and Co-Workers Practices, have a mean value above 3.7 while only one safety climate; Safety Attitude have a mean value below 3.0, which is also the lowest among all variables.

Supervisory safety practices record the highest mean value of $3.9071 \approx 4.0$ with a standard deviation of 0.41285. Based on this mean value, majority of the

respondents agrees that the safety performance of the working environment at the construction area largely dependent on the Supervisory Safety Practices (SSP). This is relatable since other empirical research also indicates that supervisors have an important role to play in safety climate. For example, a model that integrates the safety influences of managers and supervisors is offered by Thompson and team in the year 1998, who tested a model based around two central pathways: from 'organisational politics' to 'manager support for safety' to 'safety conditions' and also from 'supervisor fairness' to 'supervisor support for safety' to 'safety compliance' (Yule et al., 2007). As for the standard deviation, all safety climate has a value lower than 1.0. In general, the low standard deviation value concludes the respondents' answer in the questionnaire survey have a small variation.

Table 4.3
Mean Value and Standard Deviation of the Independent Variables (Safety Climate) (n=61)

Variables	Mean Value	Standard Deviation
Safety Performance (SP)*	3.9016	0.40599
Management Safety Practices (MSP)*	3.8921	0.43815
Supervisory Safety Practices (SSP)*	3.9071	0.41285
Safety Attitude (SA)*	2.6189	0.85191
Safety Training (ST)*	3.8056	0.59535
Job Safety (JS)*	3.7869	0.52891
Co-workers Safety Practices (WSP)*	3.7443	0.57519

Note: *1= Strongly Disagree, 2=Disagree, 3=Unsure, 4=Agree, 5=Strongly Agree

4.2.2 Reliability Test

Reliability is termed as the proportion of observed score variance that comparable and represented to true score variance. There are several methods to establish the reliability of a measuring instrument, and the internal consistency method is the popularly used method in studies with cross-sectional design (Vinodkumar & Bhasi, 2010). For the factor analysis by reliability test, internal consistency reliability coefficient for all variables was calculated using Cronbach's coefficient alpha, α. Cronbach's coefficient alpha is used when questions are rated on interval scales such as five point Likert scales, as used in this questionnaire survey, and represents the reliability coefficient that would have been obtained from all possible combinations of dividing the questions into two sets (split-halves) (Cooper & Phillips, 2004).

The data obtained is represented in table 4.5. From the data, all internal consistency estimates for the variables ranged between 0.860 (Job Safety) and 0.944 (Safety Training), with no elimination of data done. As defined by Nunally in 1978, an value of 0.70 or above is considered to be the criterion for demonstrating strong internal consistency of established scales (Vinodkumar & Bhasi, 2010). Based on the data tabulated, it can be concluded that variables are proven to be reliable and valid for the research analysis, with a high reliability coefficient.

Table 4.4
Declaration of items based on the survey questionnaire

Variables	Items	No. of Items
Safety Performance (SP)*	H48 - I57	10
Management Safety Practices (MSP)*	B1-B12	12
Supervisory Safety Practices (SSP)*	C13 - C21	9
Safety Attitude (SA)*	D22 -D29	8
Safety Training (ST)*	E30 - E36	7
Job Safety (JS)*	F37 -F42	6
Co-workers Safety Practices (WSP)*	G43 - G47	5

Table 4.5
Cronbach's Coefficient alpha, α of the Independent Variables (Safety Climate) (n=61)

Variables	Cronbach's coefficient alpha, α	Eliminated items
Safety Performance (SP)*	0.893	-
Management Safety Practices (MSP)*	0.889	-
Supervisory Safety Practices (SSP)*	0.873	-
Safety Attitude (SA)*	0.930	-
Safety Training (ST)*	0.944	-
Job Safety (JS)*	0.860	-
Co-workers Safety Practices (WSP)*	0.920	-

4.2.3 Pearson Correlation Test

The relationship between the independent variables is determined via Pearson co-relation coefficient, *r*. Correlation is method for investigating the relationship between two quantitative, continuous variables; Pearson's correlation

coefficient, *r* is a measure of the strength of the relationship between the two variables (Glendon & Litherland, 2001). For this part, the relationship between safety climate and safety performance is analysed. Table 4.6 summarizes the coefficient, *r* the variables.

Table 4.6
Pearson Co-relation coefficient, r of the Independent Variables (Safety Climate)

	SP	MSP	SSP	SA	ST	JS	WSP
SP	1						
MSP	0.739**	1					
SSP	0.777**	0.830**	1				
SA	-0.250	-0.033	-0.108	1			
ST	0.689**	0.731**	0.696	-0.224	1		
JS	0.374**	0.068	0.100	-0.122	0.033	1	
WSP	0.681**	0.647**	0.667**	-0.455**	0.703**	0.252*	1

Note: SP = Safety Performance; MSP = Management Safety Practices; SSP = Supervisory Safety Practices; SA = Safety Attitude; ST = Safety Training; JS = Job Safety; WSP = Co-workers Safety Practices
** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Table 4.6 reveal the total scores of safety performance, management safety practices, supervisory safety practices, safety attitude, safety training, job safety and co-worker's safety practices. From the table, it is found that safety attitude is negatively correlated to safety performance and the relationship is not significant. Safety attitude is the only dimension with insignificant relationship to safety performance. All other dimensions of safety climate do have a positive and significant relationship with safety performance. It is found that supervisory

safety practices have the largest r coefficient of 0.777 ($p<0.01$) with relation to the dependent variable, safety performance.

4.2.4 Regression Test

Multiple regression analysis is used to further study and analyse the relationship between the independent variables and the fixed variable in this case, safety participation (SP). It consists of mathematical workings that provide the information on the variability level within a regression model and form a baseline to test on the significance of the regression data. The regression equation for all tested safety climates are summarized in Table 4.7.

Table 4.7 depicts the regression of the tested safety climate dimension; management safety practices, supervisory safety practices, safety attitude, safety training, job safety and co-worker's safety practices is significant ($R = 0.874$, $R^2 = 0.764$, $AdjR^2 = 0.738$, and $F(61,6) = 29.122$). If translated, the β coefficient between the tested safety climate dimension and the fixed dimension is 0.874; with 76.4% variance in safety participation can be explained in the entire tested safety climate. $AdjR^2$ value represents the degree of generalizability of the β coefficient. Generalizability is defined as a statistical framework in investigating reliable observation or data under specific conditions, which is vital in accessing the reliability of the performance assessments done in a study (Vinodkumar & Bhasi, 2009).

Table 4.7
Multiple ANOVA of Independent Variables (Safety Climate) (n=61)

Independent Variables	β coefficient
Management Safety Practices (MSP)*	0.227
Supervisory Safety Practices (SSP)*	0.393
Safety Attitude (SA)*	-0.461
Safety Training (ST)*	0.145
Job Safety (JS)*	0.232
Co-workers Safety Practices (WSP)*	-0.020
F	29.122
R	0.874[a]
R^2	0.764
$AdjR^2$	0.738

Note:
a = Dependent variable: Safety Performance

The generalizability of this model in other population is 0.738, with a difference of 3.4% from the R^2 value. From this, we conclude that the model is valid with a very low correction value (<5%). In a whole, the ANOVA test shows the model tested is valid and shows a significant and linearly related to the fixed variable, safety performance.

Based on the tested 6 safety climates, Supervisory Safety Practices (SSP) is significant ($p<0.01$) and have the highest score of β coefficient of 0.393. Relatively, the findings show that supervisory safety practices are the vital safety climate in predicting and determining the safety performance of workers at the construction site in Motorola Penang. Besides, supervisory safety practices, other significant safety climate is management safety practices ($\beta = 0.227$, $p<0.01$).

4.3 Data Analysis Summary

Table 4.8
Summary of Hypotheses Analysis Verdict

Hx	Hypothesis	Verdict
H1	There is a significant relationship between the management safety practices and safety performance	Accepted
H2	There is a significant relationship between the supervisory safety practices and safety performance	Accepted
H3	There is a significant relationship between safety attitude and safety performance	Rejected
H4	These is a significant relationship between safety training and safety performance	Accepted
H5	There is a significant relationship between job safety and safety performance	Accepted
H6	There is a significant relationship between co-worker's safety practice and safety performance	Accepted
H7	There is a significant influence of safety climate dimensions on safety performance	Accepted

4.4 Summary

In this chapter, the findings from the survey questionnaire and the data analysis form the findings are explained and presented in form of tables. All the survey findings were analysed using SPSS software for descriptive analysis, correlation analysis and also reliability analysis. The discussion the obtained data will be discussed elaborately in the next chapter

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

In this chapter, the findings and results from the data analysis as presented in Chapter 4 will be discussed. Besides elaborate discussion on the findings, the implication of the survey questionnaire study, recommendations and also conclusion based on the findings will be presented. The discussion is based on the dependent variable (safety performance) and independent variables (safety climates), and its impact on the study subject.

5.2 Discussion

5.2.1 Relationship between Management Safety Practices and Safety Performance

The safety climate, management safety practices here refers to companies' policies and practices that adhere to the law by the government and also other interested third party. This includes the actual practices, roles and functions associated in maintaining a safe area for their employees (Vinodkumar & Bhasi, 2010). In Malaysia, safety practices at workplace should comply with the policies and standards set by the Department of Safety and Health (DOSH). These management safety practices should comply with the Occupational Safety and Health Act (1994).

In this study, it is found that the management safety practices have a significant impact on the safety performance dimensions. Management safety practices have a mean value of 3.8921 which is close to 4.0 with a standard deviation of 0.43815. The data shows most respondents agree (Score 4) that the management safety practices (Item B1 – B12) have a significant impact on the safety performance. The Cronbach coefficient alpha, α of this safety climate which scored 0.873 (<0.7) proves that the data obtained is reliable and can be taken accountable for other data analyses.

The Pearson Co-relation coefficient, r shows that this climate is significantly co-related to the safety performance with a score of r = 0.739 ($p<0.01$). Moreover, this safety climate is co-related internally to other safety climate like supervisory safety climate (r=0.252) and job safety (r=0.252). In other words, they have these safety climates have a shared weightage in determining the safety climate. Finally, the multiple regression study (ANOVA) of the safety climate scores 0.227 ($p<0.01$) proving that management safety climates have indeed a significant impact on the safety performance of workers at the construction site of Motorola Penang.

The strong evidence that could support these findings should be the Contractor OSH Management plan implemented in Motorola Penang. Through this system, the management able to filter potential vendors or contractors not only based on monetary (i.e. tender offer), but also able to employ only competent vendors who are able to comply to all safety policies as indicated through this system. Besides, through this system, the contractors are educated on the internal practices and able to educate his/her sub-ordinates that are working at the

construction site and also aware of the consequences when not complying to the management safety polices. Nevertheless, the appointment of Safety Officers and Site Safety Supervisor further enhance the tight monitoring of the management towards the safety participation and compliance of the construction workers.

The findings of this study prove the extent of importance and commitment of the management towards safety of the construction workers and hence, management safety practices are significant towards the safety performance of construction workers at Motorola Penang.

5.2.2 Relationship between Supervisory Safety Practices Safety Performance

Supervisory safety practices (Item C13 – C21) is chosen as the safety climate to be studied in this research. In an initial study done by Komaki (1998), it is noted that superior's primary role indeed influences subordinate behaviour either safety behaviour or work ethics. This is because an effective line of supervisors continually able to provide the antecedents and consequences employed in behavioural safety monitoring. This includes the role of supervisors to monitor work in progress of their subordinates and act accordingly, providing positive or negative impact depending on the outcome of the monitoring and evaluation activities (Zohar & Luria, 2003).

Findings of the questionnaire study shows that this safety climate has a mean value of 3.9071, with a standard deviation of 0.41285. In fact, this factor is the most agreed safety climate by the survey respondents. In other words, majority of the respondents agree that the supervisory safety climate give a large influence on the safety performance of the construction workers. From the analysis, this

safety climate has a Cronbach's coefficient alpha, α of 0.930, Pearson co-relation coefficient, r of 0.777 ($p<0.01$) towards the safety performance and β coefficient of 0.393 ($p<0.01$). Based on the analysis, supervisory safety practices can be summarized as a reliable and acceptable safety climate, with a significant relationship on the safety performance

The supervisory safety practices here can be grouped as 1) internal supervision and safety practices i.e. the contractor towards the construction workers and 2) supervision and safety practices by the executives of Motorola Inc. The supervision of the contractors to ensure the workers to follow safety practices and safety attitude in performing their tasks is vital as the superior have the primary role in influencing subordinate behaviour (Zohar & Luria, 2003). O'Dea (2002) also proved that supervisor commitment to safety was predictive of worker propensity towards safety performance and safety attitude.

The second level supervisory safety practices refer to the practices by the executives of Motorola Penang to ensure a safe working environment and the workers to comply with the regulations by the management at the same time the legal authorities. This factor has some correlation with the Management safety practices, which can be proved with the Pearson co-relation, r value of 0.830 ($p<0.01$) with management safety practices. This phenomenon is called multicollinearity; whereby independent factors determine its significance on the dependent. Nevertheless, from three Spanish samples of 'high risk organisations' by Tomas and team in the year 1999, imply that supervisor's role in the accident prevention process is vital, whereby they transfer the elements of safety climate to members of the workforce. The supervisors at all time would ensure the

construction workers follow the safety practices as the consequences if not complied would include for any unforeseen event such as fatality, lost time injury and etc., as DOSH had implied that construction work area is one of the high risk for industrial accidents in their study. In case of non-compliance both the contractor and management would be penalized by the regulatory body.

Another supporting literature support came from a tested model in which the causal chain ran from 'safety climate' to 'supervisor response' to 'co-worker response' to 'worker attitude', and then to 'safety behaviour', 'risk' and finally 'accidents' (Yule et al., 2007). In another study, supervisors could dramatically improve safety performance and compliance by merely enforcing and emphasising safety in interactions that take place on the work area is an example of a micro-level change in culture. Supervisors are also deemed as role models instilling safety awareness among their subordinates and supporting safe behaviour at work, hence further strengthening the fact and findings that supervisory safety practices have a significant impact towards the safety performance of the construction workers at Motorola Penang.

5.2.3 Relationship between Safety Attitude and Safety Performance

The safety climate, safety attitude can be denoted as a human factor, whereby changes occurring at the work environment or the work environment itself giving impact on the safety performance as well as the work performance (Siu et al., 2003). In other words, the social-psychological factor gives a large input on the safety performance. In an initial study, Donald and Canter (1993) proposed a theory using attitudinal approach, whereby a large number of accidents

occurring in the basic premise occurred. The people involved in the accident did not intend to have an accident but their behaviour caused the accident intentional and they are aware of what they are doing. This findings is in contrast with the basic idea of accident occurring due to momentary lapse or slip of concentration (Mearns et al, 2003; Siu et al., 2003). In another context, safety culture at workplace is vital as it forms the context within which individual safety attitudes develop and persist and safety behaviours are promoted (Hee & Ping, 2014).

In this research finding, the questionnaire response gives a mean value of 2.6189 with a variance of 0.85191. This shows that most respondents' chose the option between neutral and disagree for this part of the questionnaire. Nevertheless, the Cronbach's coefficient alpha, α obtained from the reliability test is 0.944 (≤ 0.7) proving the variable is reliable and valid. However, the Pearson co-relation coefficient, r is negatively correlated to the safety performance as well as other safety climates. Hence, this safety climate is found to be non-significant. The regression analysis also scored the β coefficient of this safety climate negatively related to the fixed variable, safety performance.

Safety attitude is a factor that can be manipulated easily by other safety climate that are studied in this research. A person's behaviour towards a safe working practice may influence another, regardless of the implementation and enforcement of safety policies at the place of work. Safety attitude also may overlap with other safety climates that are not studied in this research like work pressure, risks and also competence of the worker, since it is a social-psychological factor. Besides, the safety attitude is less significant in this target

group as the construction workers as well as the supervisors and executives are always aware to keep up safety practices due to the management enforcement.

5.2.4 Relationship between Safety Training and Safety Performance

Safety training in this research scope refers to the awareness and training programs that the target group undergo prior the job or assignment of job to acquire the knowledge and skills about the risks in job (Azimah et al., 2009). Safety training is vital for those working in high risk job are, and since construction work area is one of the high-risk job area, hence this safety climate was chosen to be studied in this research.

Safety training have a mean value of 3.8056 with a variance of 0.59535. This data shows most respondents are likely to have chosen option 3 'neutral' and 4 'agree' for items E30 – E36 in the questionnaire. From the reliability test, it is found that the Cronbach's coefficient alpha, α is 0.860 ($\leq$ 0.7), proving that this independent variable is valid. Further analysis was done, by determining the Pearson co-relation coefficient, r of 0.689 ($p<0.01$) in relation to the dependent variable, safety performance. From this analysis, it is found that job training has a significant effect on the safety performance. Multiple regression analysis depicts the β coefficient of 0.145, which is very small than the chosen safety performance, management safety practices and supervisory safety practices. Even though the analysis shows a positive result, this safety climate shows less significance than that of management safety practices and supervisory safety practices.

Various researchers have previously studied the significance of safety training towards safety performance. However, the safety training in this case

study is largely dominated by the factor of management safety practices, which include the competency of the construction workers to understand the risks of the job and follow the practices as instructed, as per the regulations by DOSH as well. In this study, the safety climate safety training is concluded as less significant as this factor overlaps with management safety performance. The perception of the respondents indicates that the management safety objectives gave rise for safety training to be conducted, and therefore seems less significant when compared to management safety practices.

5.2.5 Relationship between Job Safety and Safety Performance

Job safety can be interpreted as the amount of risk a person is exposed when conducting his/her job and their behaviour in complying to the enforcement of safety practices at work place (Fugas et al., 2012). DOSH has addressed the risks involved in construction work are, and the developer management and client must comply to those regulation as stated in OSHA act 1994. Job safety is chosen as the safety climate to be studied in this research study as this is a social-psychological factor as well, and the behaviour, awareness and perception of the employee towards safety at the place of work.

From the questionnaire data analysis, it is found that this safety climate has a mean value of 3.7869, with a standard deviation of 0.52891. Items F37 -F42 represents the safety climate job safety denoting that most respondents have chosen the option 3 “neutral” and 4 “agree”. This indicates a positive response towards the implications of job safety towards safety performance of the construction workers at Motorola Penang. As for the reliability test, this safety

climate scores the Cronbach's Coefficient alpha value of 0.920 (≤ 0.7), indicating that the data obtained for this safety climate is reliable.

Other analyses include Pearson co-relation test and ANOVA test. The Pearson Co-relation coefficient, r for job safety is 0.374 ($p<0.01$) in relation to safety performance. However, this variable is not significant towards other safety climates. Multiple regression analysis reveals that job safety has β coefficient of 0.232. This value is higher than that of management safety practices, yet is not chosen as the significant variable affecting safety performance as the correlation of this safety climate with other variables is not significant.

The hypothesis proposed for the safety climate job safety is accepted regardless the weightage of significance towards safety performance is low. Nevertheless, job safety is a factor that should be addressed by all parties, since the awareness towards the risk may eliminate the occurrence of accidents at the construction area of Motorola Penang. Safety culture norm at workplace cultivates engagement of employees towards job safety. If workers perceive reference groups as performing their jobs safely, they are also more likely to be motivated to enhance their own safety performance. Hence, the validity of the current study incorporates this taxonomy of norms into the theory of planned behaviours, improving the normative component of this theory into a more holistic approach to social influences on safety (Fugas et al., 2012). In other words, a competent culture towards safety and safe work place will promote job safety and safe work environment.

5.2.6 Relationship between Co-workers Safety Practices and Safety Performance

At a place of work, co-workers or colleagues play an important impact on the workers, especially those who are new at that particular place of work. In this study, co-worker's safety practices are chosen as the safety climate to be studied, due the nature of work at construction areas require two or more people working at a specified area (buddy systems). Moreover, co-workers are those whom interacts each other at most times at the place at work. Co-workers safety practices can also be denoted as safety related conditions at a place of work as the behaviour of the co-worker may influence one's perception towards safety culture at the place of work (Lu & Tsai, 2008).

Items G43 - G47 represents the statements regarding co-worker's safety practices in the questionnaire. This safety climate scores a mean value of 3.7443 with a standard deviation of 0.57519. The data depicts that most respondents chose option 3, neutral and 4, agree, on the 5 statements listed on co-worker's safety practices, like that of other safety climates studied in this research. The Cronbach's coefficient alpha, α of this safety climate is 0.893 denoting that this variable is valid for further analysis. The Pearson co-relation coefficient, r of this safety climate is 0.681 ($p<0.01$), and hence have a relation with the safety performance. Other than that, this safety climate also shows correlation all other safety climates except safety attitude. However, ANOVA test of this variable gives a value of -0.020. The negative value indicates that safety climate is insignificant towards the safety performance.

Even though this safety climate shows a negative regression value, yet, other correlations with co-worker's safety practices in the safety performance of

the workplace. The weightage of significance is low due to the dominance of both management and supervisory safety practices in this study. Both parties had ensured the workers to be highly competent and well informed on the safety procedures via the contractor OSH management plan

5.2.7 Influence of Safety Climate Dimensions on Safety Performance.

From the above findings, the safety climates; Management Safety Practices, Supervisor safety practices, Safety Training, Job Safety and Co- worker safety practices shows relationship to the dependant variable, Safety performance. As mentioned above, 5 out of 6 safety climates show significant influence on the safety performance. Hence, the safety climate studied in this research shows a significant influence on the safety performance of contractors at Motorola Inc. Penang.

5.3 Impact of the Research Findings

This research gives a substantial view of safety performance of the target group, construction workers who are involved in the renovation and repair works at Motorola Penang. The target group also represents people from management level, supervisory level as well as the workers involved in the construction works.

Besides academic input, this research also helps to give input on the level of safety performance to the management of Motorola Penang. This input may be used by the management and also supervisory level control to further brush up and improve the efficiency of safety management at the place of work. The

construction work at Motorola Penang is considered as an occupational risk area as the workers as well as any personnel whom enters the construction site is exposed to the risks of occupational accidents. Motorola Penang has an established safety management system and administration, and this EHS department is responsible in managing the safety policies and regulations of the company.

The core objective of this department is maintaining a safe and free of risk place of work. This also applies for external vendors, in this case the construction contractor and workers hired by the management to carry out the renovation works. The safety department is one of the department which can be benefited from this study as they are able to measure the effectiveness of the safety regulations imposed on the construction workers. Besides that, the workers themselves are able to rationalize the safety practices that were enforced upon them when taking part in the questionnaire survey.

The study also reflects on the level of emphasis of safety at work by all interested parties; the management, the regulatory bodies, the contractors and finally the workers themselves. The contractor management system in Motorola Penang gave a large impact on the perception of the contractor and workers on the importance of maintaining a safe place of work. The safety climates studied in this research; management safety practices, supervisory safety practices, safety attitude, safety training, job safety and co-worker's safety practices are indeed a reliable and valid to the target group, in reference to the literature by previous researchers and the suitability of the case study.

The enforcement of safety culture at work is important at any workplace especially at high risk area, and is measured by the safety performance of the workers. The safe work culture will further improve with the engagement in between workers, their superior and the management. This will also improve the degree of awareness towards a safety and safe work culture among the members of the organization. It is proven that an accident free place of work measures good safety culture cultivation and safety performance among the workers, at the same time able to improve work efficiency and incurred costs.

Moreover, this research study is able to give input on the grey areas that can be further improved to the both management of Motorola Penang and the construction contractors. This recommendation can also act as the guidelines for ideas of improvement in safety policy enforcements, awareness programmes and development of a more- lean safety management system.

5.4 Recommendations

The findings accumulated from this questionnaire study reflect the extent of safety awareness within the organization and the target group. Based on the research findings, there are several recommendations to be proposed for future research scopes and also for the organization itself. These recommendations can be used as a guideline for future projects.

5.4.1 Recommendation to the Organization

Based on the hypothesis study as discussed in this thesis, it proves that 5 out of 6 dimensions have strong influence in the current Motorola OSH management system. However, safety attitude showed less significance based on the responses from the targeted sampling group. It is highly recommended for Motorola to review, internalise and put forward appropriate action plans on all the dimensions as discussed. Following are the recommendations to help Motorola to improve the existing OSH Management System on construction works.

i. Focus on Motorola middle management and contractors' supervisor safety practices development to have a larger impact on the safety performance. Most organizations would manage the performance of the contractor reactively. While this may lead to short-term gains, a better approach would be to focus on a sustainable safety performance. An example would be by conducting series of educational and safety programs to assist Motorola management as well as its contractors to embrace the key safety management practices. To complement the above, Motorola can put forward 2 action plans:

   a. Make safety as a Key Performance Indicator (KPI) for its middle management, in which it's measurable as part of their annual performance review. This will help to foster and instil effective and measurable safety performance behaviour as envisaged by the company.

   b. As for the contractors, Motorola can implement a safety performance bonus scheme based on the set of KPI targets.

ii. Motorola contractor's KPI targets should include all the safety climate dimensions which are management safety practices, supervisory safety practices, safety attitude, safety training, job safety and also co-worker's safety practices as it directly impacts their safety performance. The KPI shall focus on assessment of the contractors' safety performance on a quarterly basis and to be evaluated yearly to determine their qualification status to continuously be able to be allowed to work on Motorola construction works. Poor KPI result from the contractor should subject them to be temporarily disqualified, while continuous poor KPI performance should lead to a permanent termination as Motorola qualified contractors.

iii. It is also highly recommended for Motorola to expand the coverage of the contractors OSH management system beyond construction activities. Being a member of The Penang Free Industrial Zone Companies (FREPENCA), it is also desirable for Motorola to take the lead and proliferate the OSH management system across other FREPENCA members.

iv. Safety training programs for the workers must be included as part of the agreement with the contractors. It has to be made mandatory that contractors must have continuous and regular safety education programme for its employees. The compliance to this contractual requirement will need to be monitored and measured as part of the KPI to help driving safety attitude among the contractors' workers.

v. Frequent site inspection and document audit shall be conducted by Motorola on contractor's safety management system and site condition.

This is to ensure the work environment and the workers safety are mitigated from unsafe act and condition. The inspection shall be conducted by Motorola and contractor's management team together with some randomly selected workers. By doing so, it is strongly believed that it will bring better impact on safety awareness to the workers who are the real targeted group. Any observation from the audit shall be documented and be recommended as continual improvement for construction company to ensure the job safety are safe and free from risk.

vi. The project manager and supervisor engagement on safety briefing, safety talk and tool box talk should be to further expend so that more time are employed with the workers. Awareness training for workers must include the contents and reports by DOSH on the recent years' workplace accident data and case study of related work field. This will help to improve the safety awareness among workers by understanding the threats and risks at workplace and be more vigilant on the safety rules and procedures. The workers need to also be reminded on the legal penalties for non-compliance.

vii. The senior management shall role model safety behaviours at all times and be seen as strongly influencing and implementing safety culture in the organization. Their commitments and involvements on the safety compliances together with the extra attention will inspire and change the mind-set and behaviour of Motorola employees and contractors. The management shall encourage, support and provide funding on relevant safety training and development programs for its employee. The same shall apply to the contractors.

5.4.2 Recommendation for future studies

i. Increase research target group size to further validate and verify the effect of safety climate on the safety performance of the construction workers as the number of respondents were too little and (n=61) and it was a tad bit difficult to make justifications on the analysis in the beginning

ii. Widen the scope of research by evaluating other probable safety climate dimensions that may affect the safety performance that are valid to the nature of the target group

iii. Health factors that are not implemented or not enforced

iv. Widen the target group scope to the constructor management level and suppliers whom are involved in the construction projects in Motorola Penang

5.5 Conclusion

In this research study, the safety climates affecting the safety performance of the construction workers at Motorola Penang are able to be identified using the questionnaire survey method. The statistical analysis method which is chosen in this research are reliability test, correlation test and multiple regression tests, using the software SPSS version 19 able to reveal the safety climate that determines and influences the safety climate of the target group. Management safety practices and supervisory safety practices give a large impact on the safety performance of the construction workers and influence

the safety culture at the place of work. Hope that the findings of this research could be benefited by all relevant parties in further enhancing the safety performance of the target group.

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APPENDIX A

OTHMAN YEOP ABDULLAH GRADUATE SCHOOL OF BUSINESS
UNIVERSITI UTARA MALAYSIA

BORANG KAJI SELIDIK

Terima kasih kerana sudi meluangkan masa untuk mejawab boring soal selidik ini. Soal selidik ini bertujuan untuk mendapatkan pandangan berkaitan prestasi keselamatan di tapak pembinaan dan renovasi di Motorola Solutions Pulau Pinag. Kajian ini merupakan salah satu syarat bagi saya untuk melengkapkan kajian sayan dan memperoleh Ijazah Sarjan Sains (Pengurusan). Kajian ini diselia oleh Dr. Munauwar Bin Mustafa (UUM). Maklum balas tuan/puan amat berguna kepada saya untuk mengkaji tahap prestasi keselamatan di tapak pembinaan Motorola Solutions Pulau Pinang.

Saya memohon kerjasam tuan/puan untuk mejawab soal selidik ini dengan jujur dan ihklas. Soal selidik ini mempunyai 47 soalan dan tidak akan mengambil masa lebih dari 10 minit masa tuan/puan. Tiada jawapan betul atau salah. Oleh itu tuan/ puan boleh menjawab mengikut pendapat dan keseuaian anda terhadap kenyataan yang dikemukakan dalam borang ini.

Hasil kajian ini adala sulit dan akan digunakan untuk tujuan penyerlidikan sahaja. Kerjasam tuan/puan dalam kajian soal selidik ini adalah amat dihargai. Kertas soal selidik ini adalah dwibahasa (Bahasa Melayu dan Bahasa Inggeris). Terima Kasih

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PENGARUH IKLIM KESELAMATAN KE ATAS PRESTASI KESELAMATAN: KAJIAN TERHADAP KONTRAKTOR DI MOTOROLA SOLUTION, PENANG

Bahagian A: Demografi Responden

Arahan: Sila tandakan (X) pada petak yang berkenaan

1)	Umur	☐	20-30 tahun	☐	41-50 tahun
		☐	31-40 tahun	☐	> 50 tahun
2)	Jantina	☐	Lelaki	☐	Perempuan
3)	Warganegara	☐	Warga Malaysia	☐	Bukan WargaMalaysia
4)	Jawatan	☐	Pekerja Am	☐	Pegawai Keselamatan/ Penyelia
		☐	Kontraktor	☐	Eksekutif
5)	Syarikat	☐			

Bahagian B: Amalan Keselamatan Pihak Pengurusan

Arahan: Sila bulatkan jawapan anda pada skala yang bersesuaian..

1	2	3	4	5
Sangat Tidak Setuju	**Tidak Setuju**	**Tidak Pasti**	**Setuju**	**Sangat Setuju**

1. Syarikat saya pantas memberikan respon kepada masalah keselamatan	1	2	3	4	5
2. Syarikat saya memberi maklumat tentang keselamatan	1	2	3	4	5
3. Syarikat saya mengadakan mesyuarat tentang keselamatan pekerjaan secara berkala	1	2	3	4	5
4. Syarikat saya akan menyiasat masalah keselamatan dengan segera	1	2	3	4	5
5. Syarikat saya menjalankan pemeriksaan keselamatan dengan kerap	1	2	3	4	5
6. Syarikat saya menyediakan peralatan keselamatan yang cukup	1	2	3	4	5
7. Syarikat saya sentiasa memaklumkan tentang bahaya kepada pekerja-pekerja	1	2	3	4	5
8. Syarikat saya memberi penekanan kepada keadaan kerja yang selamat	1	2	3	4	5
9. Syarikat saya menyediakan program latihan keselamatan yang mencukupi	1	2	3	4	5

10. Syarikat saya menyediakan peralatan keselamatan yang baik	1	2	3	4	5
11. Syarikat saya melabelkan tanda amaran pada bahan kimia yang berbahaya.	1	2	3	4	5
12. Syarikat saya memberi ganjaran kepada pekerja yang berkerja dengan selamat	1	2	3	4	5

Bahagian C: Amalan Keselamatan Pihak Penyelia

13. Penyelia saya bertindak terhadap cadangan keselamatan oleh pekerja	1	2	3	4	5
14. Penyelia saya menggalakkan tingkah laku yang selamat	1	2	3	4	5
15. Penyelia saya mengambil berat tentang keselamatan pekerja	1	2	3	4	5
16. Penyelia saya memuji tingkah laku kerja yang selamat	1	2	3	4	5
17. Penyelia saya membincangkan isu-isu keselamatan dengan orang lain	1	2	3	4	5
18. Penyelia saya memastikan pekerja dimaklumkan mengenai peraturan keselamatan	1	2	3	4	5
19. Penyelia saya melibatkan pekerja dalam menetapkan matlamat keselamatan	1	2	3	4	5
20. Penyelia saya menguatkuasakan peraturan keselamatan	1	2	3	4	5
21. Penyelia saya sering menyebut bahawa keselamatan adalah sama penting dengan kecekapan	1	2	3	4	5

Bahagian D: Sikap Keselamatan

22. Penggunaan peralatan keselamatan tidak boleh mengurangkan kecederaan dan kemalangan	1	2	3	4	5
23. Prosedur operasi yang selamat tidak boleh mengurangkan kemalangan	1	2	3	4	5
24. Saya melanggar peraturan keselamatan semasa di bawah tekanan kerja	1	2	3	4	5
25. Saya mengabaikan peraturan keselamatan untuk menyelesaikan kerja yang dilakukan	1	2	3	4	5
26. Kemalangan tidak dapat dielakkan ataupun keselamatan pekerja tidak dapat dilindungi	1	2	3	4	5
27. Saya akan mengabaikan prosedur berkerja yang selamat untuk kemudahan saya	1	2	3	4	5
28. Saya menilaikan kemalangan sebagai nasib malang	1	2	3	4	5
29. Saya tidak suka menerima cadangan keselamatan daripada orang lain	1	2	3	4	5

Part E: Latihan Keselamatan

30. Program-program latihan keselamatan membantu mengelakkan kemalangan di syarikat saya	1	2	3	4	5
31. Program-program latihan keselamatan di syarikat saya adalah berguna	1	2	3	4	5
32. Program-program latihan keselamatan di syarikat saya adalah berbaloi	1	2	3	4	5

33. Program-program latihan keselamatan di syarikat saya berkaitan dengan kerja saya	1	2	3	4	5
34. Program-program latihan keselamatan di syarikat saya adalah jelas	1	2	3	4	5
35. Program-program latihan keselamatan di syarikat saya adalah baik	1	2	3	4	5
36. Program-program latihan keselamatan di syarikat saya sangat berkesan	1	2	3	4	5

Bahagian F: Keselamatan Tugas

37. Kerja di tapak kerja tidak selamat	1	2	3	4	5
38. Kerja di tapak kerja adalah berisiko	1	2	3	4	5
39. Berkerja di tapak kerja seseorang boleh tercedera dengan mudah	1	2	3	4	5
40. Kerja di tapak kerja tidak sihat	1	2	3	4	5
41. Kerja di tapak kerja adalah berbahaya	1	2	3	4	5
42. Kerja di tapak kerja menakutkan	1	2	3	4	5

Bahagian G: Amalan Keselamatan Rakan Sekerja

43. Rakan sekerja saya mengalakkan orang lain berada dalam keadaan selamat	1	2	3	4	5
44. Rakan sekerja saya mengambil berat tentang keselamatan kerja	1	2	3	4	5

45. Rakan sekerja saya mengambil berat tentang keselamatan orang lain	1	2	3	4	5
46. Rakan sekerja saya ikut peraturan keselamatan	1	2	3	4	5
47. Rakan sekerja saya memastikan kawasan kerja selamat	1	2	3	4	5

Bahagian H: Pematuhan Keselamatan

48. Saya sentiasa ada kesedaran keselamatan di tempat kerja	1	2	3	4	5
49. Saya mematuhi kepada peraturan keselamatan dan prosedur operasi standard	1	2	3	4	5
50. Saya tidak mengabaikan keselamatan, walaupun dalam keadaan tergesa-gesa	1	2	3	4	5
51. Saya memakai peralatan perlindungan peribadi semasa bekerja	1	2	3	4	5
52. Saya yakin dengan kebolehan saya untuk bekerja dengan selamat	1	2	3	4	5

Bahagian I: Penyertaan Keselamatan

53. Saya aktif melibatkan diri dalam menetapkan matlamat keselamatan	1	2	3	4	5
54. Saya secara aktif mempromosi cadangan-cadangan penambahbaikan keselamatan	1	2	3	4	5
55. Saya secara aktif mengambil bahagian dalam mesyuarat keselamatan	1	2	3	4	5

56. Saya secara aktif mengambil bahagian atau membantu rakan sekerja dengan isu yang berkaitan dengan keselamatan semasa taklimat keselamatan	1	2	3	4	5
57. Saya secara aktif mengambil bahagian dalam membuat keputusan keselamatan dengan penyelia saya	1	2	3	4	5

Terima kasih untuk meluangkan masa anda.

THE INFLUENCE OF SAFETY CLIMATE ON SAFETY PERFORMANCE: STUDY ON THE CONTRACTORS OF MOTOROLA SOLUTIONS, PENANG

Part A: Demography of the Respondent

Instructions: Please tick (X) on the related column.

1)	Age	☐	20-30 years old	☐	41-50 years old
		☐	31-40 years old	☐	> 50 years old
2)	Gender	☐	Male	☐	Female
3)	Nationality	☐	Malaysian	☐	Non-Malaysian
4)	Position	☐	General Worker	☐	Safety Officer/ Supervisor
		☐	Contractor	☐	Executive
5)	Company	☐			

Instructions: Please rate how much you personally agree or disagree with these statements. Please circle the correct answer.

1	2	3	4	5
Strongly disagree	**Disagree**	**Unsure**	**Agree**	**Strongly agree**

Part B: Management Safety Practices

1. My company responds quickly to safety concerns	1	2	3	4	5
2. My company provides safety information	1	2	3	4	5
3. My company has a regular job safety meeting	1	2	3	4	5
4. My company investigates safety problems quickly	1	2	3	4	5
5. My company conducts frequent safety inspections	1	2	3	4	5
6. My company provides enough safety equipment's	1	2	3	4	5
7. My company keeps workers informed of the hazards	1	2	3	4	5
8. My company emphasizes safe working conditions	1	2	3	4	5
9. My company provides enough safety training programs	1	2	3	4	5
10. My company provides good safety equipment's	1	2	3	4	5

11. My company label warning signs for hazardous substances	1	2	3	4	5
12. My company rewards safe workers	1	2	3	4	5

Part C: Supervisory Safety Practices

13. My supervisors act on safety suggestions by the workers	1	2	3	4	5
14. My supervisors encourage safe behaviours	1	2	3	4	5
15. My supervisors care about the worker safety	1	2	3	4	5
16. My supervisors praise safe work behaviour	1	2	3	4	5
17. My supervisors discuss safety issues with others	1	2	3	4	5
18. My supervisors keep the workers informed of safety rules	1	2	3	4	5
19. My supervisors involve the workers in setting safety goals	1	2	3	4	5
20. My supervisors enforce safety rules	1	2	3	4	5
21. My supervisors frequently mention safety is as important as efficiency	1	2	3	4	5

Part D: Safety Attitude

22. The use of safety equipment cannot reduce injuries and accidents	1	2	3	4	5
23. Safe operating procedures cannot reduce accidents	1	2	3	4	5
24. I break safety rules when under job pressure	1	2	3	4	5
25. I ignore safety regulations to get the job done	1	2	3	4	5
26. Accidents cannot be avoided nor workers protected in advance	1	2	3	4	5
27. I will ignore safe working procedures for convenience	1	2	3	4	5
28. I put accidents down to bad luck	1	2	3	4	5
29. I don't like to accept safety suggestions from others	1	2	3	4	5

Part E: Safety Training

30. The safety training programs in my company help prevent accidents	1	2	3	4	5
31. The safety training programs in my company are useful	1	2	3	4	5
32. The safety training programs in my company are worthwhile	1	2	3	4	5

33. The safety training programs in my company apply to my job	1	2	3	4	5
34. The safety training programs in my company are clear	1	2	3	4	5
35. The safety training programs in my company are good	1	2	3	4	5
36. The safety training programs in my company do the work	1	2	3	4	5

Part F: Job Safety

37. Work on site is unsafe	1	2	3	4	5
38. Work on site is risky	1	2	3	4	5
39. Working on site one can easily get hurt	1	2	3	4	5
40. Work on site is unhealthy	1	2	3	4	5
41. Work on site is dangerous	1	2	3	4	5
42. Work on site is scary	1	2	3	4	5

Part G: Co- Workers Safety Practice

43. My co-workers encourage others to be safe	1	2	3	4	5
44. My co-workers care about work safety	1	2	3	4	5
45. My co-workers care about others' safety	1	2	3	4	5
46. My co-workers follow safety rules	1	2	3	4	5
47. My co-workers keep the work area safe	1	2	3	4	5

Part H: Safety Compliance

48. I maintain safety awareness at work	1	2	3	4	5
49. I comply with safety rules and standard operational procedure	1	2	3	4	5
50. I do not neglect safety, even when in a rush.	1	2	3	4	5
51. I wear personal protective equipment at work	1	2	3	4	5
52. I am confident in my ability to work safely	1	2	3	4	5

Part I: Safety Participation

53. I actively participate in setting safety goals	1	2	3	4	5
54. I actively promote safety improvement suggestions	1	2	3	4	5
55. I actively participate in safety meeting	1	2	3	4	5
56. I actively participate or helping coworkers with safety related issues during safety briefing	1	2	3	4	5
57. I actively participate in safety decision making with my supervisor.	1	2	3	4	5

Thank you for your time.

APPENDIX B

```
GET
  FILE='C:\Users\User\Desktop\VINO3.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
RELIABILITY
  /VARIABLES=B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=SCALE
  /SUMMARY=TOTAL.
```

Reliability

Notes

Output Created		16-OCT-2016 18:20:13
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61
	Matrix Input	C:\Users\User\Desktop\VINO3.sav
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.

Syntax		RELIABILITY /VARIABLES=B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA /STATISTICS=SCALE /SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.05

[DataSet1] C:\Users\User\Desktop\VINO3.sav

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	61	100.0
	Excluded[a]	0	.0
	Total	61	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.889	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B1	42.7377	24.897	.573	.883
B2	42.7049	23.745	.722	.876
B3	42.8689	22.483	.787	.870
B4	42.7377	22.397	.774	.870
B5	42.9016	23.323	.683	.876
B6	42.6721	24.524	.559	.883
B7	42.7213	23.471	.667	.877
B8	42.7541	25.455	.387	.890
B9	42.8361	22.239	.784	.870
B10	42.7541	24.589	.528	.884
B11	42.8525	25.428	.351	.892
B12	43.2131	19.004	.652	.894

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
46.7049	27.645	5.25783	12

```
RELIABILITY
  /VARIABLES=C13 C14 C15 C16 C17 C18 C19 C20 C21
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=SCALE
  /SUMMARY=TOTAL.
```

Reliability

Notes

Output Created		16-OCT-2016 18:21:53
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=C13 C14 C15 C16 C17 C18 C19 C20 C21 /SCALE ('ALL VARIABLES') ALL /MODEL=ALPHA /STATISTICS=SCALE /SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	61	100.0
	Excluded[a]	0	.0
	Total	61	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.873	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C13	31.3279	11.524	.526	.867
C14	31.1639	11.906	.458	.872
C15	31.2131	11.004	.628	.858
C16	31.3770	10.239	.674	.854
C17	31.3607	10.701	.742	.848
C18	31.2295	11.513	.473	.872
C19	31.2459	10.955	.647	.857

C20	31.1803	11.350	.606	.860
C21	31.2131	10.537	.763	.846

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
35.1639	13.806	3.71564	9

```
RELIABILITY
  /VARIABLES=D22 D23 D24 D25 D26 D27 D28 D29
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=SCALE
  /SUMMARY=TOTAL.
```

Reliability

Notes

Output Created		16-OCT-2016 18:23:14
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.

	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=D22 D23 D24 D25 D26 D27 D28 D29 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA /STATISTICS=SCALE /SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	61	100.0
	Excluded[a]	0	.0
	Total	61	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.930	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
D22	18.0984	35.457	.727	.923
D23	18.2131	34.970	.768	.920
D24	18.2623	34.930	.817	.916
D25	18.1639	33.673	.909	.908
D26	18.2131	32.870	.873	.911
D27	18.4098	35.879	.806	.917
D28	18.6230	39.805	.604	.931
D29	18.6721	39.757	.566	.933

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
20.9508	46.448	6.81524	8

```
RELIABILITY
  /VARIABLES=E30 E31 E32 E33 E34 E35 E36
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=SCALE
  /SUMMARY=TOTAL.
```

Reliability

Notes

Output Created		16-OCT-2016 18:24:52
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=E30 E31 E32 E33 E34 E35 E36 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA /STATISTICS=SCALE /SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	61	100.0
	Excluded[a]	0	.0
	Total	61	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.944	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
E30	22.6885	13.085	.874	.931
E31	22.8525	12.528	.900	.927
E32	22.8689	12.483	.831	.934
E33	22.8197	13.117	.862	.932
E34	22.9016	13.057	.749	.941
E35	22.8197	12.717	.775	.939
E36	22.8852	13.170	.731	.942

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
26.6393	17.368	4.16746	7

```
RELIABILITY
  /VARIABLES=F37 F38 F39 F40 F41 F42
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=SCALE
  /SUMMARY=TOTAL.
```

Reliability

Notes

Output Created		16-OCT-2016 18:26:12
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.

Syntax		RELIABILITY /VARIABLES=F37 F38 F39 F40 F41 F42 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA /STATISTICS=SCALE /SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	61	100.0
	Excluded[a]	0	.0
	Total	61	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.860	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
F37	18.9344	7.096	.760	.819
F38	18.9016	6.857	.716	.824
F39	18.8361	7.839	.583	.849
F40	18.9016	6.890	.815	.808
F41	18.8197	7.350	.688	.831
F42	19.2131	7.104	.461	.887

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
22.7213	10.071	3.17349	6


```
RELIABILITY
  /VARIABLES=G43 G44 G45 G46 G47
  /SCALE ('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=SCALE
  /SUMMARY=TOTAL.
```

Reliability

Notes

Output Created		16-OCT-2016 18:27:35
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=G43 G44 G45 G46 G47 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA /STATISTICS=SCALE /SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.01

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	61	100.0
	Excluded[a]	0	.0
	Total	61	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.920	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
G43	15.0328	5.532	.807	.900
G44	15.0000	5.533	.878	.889
G45	14.9672	5.332	.759	.909
G46	14.8689	5.849	.810	.903
G47	15.0164	4.750	.792	.911

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
18.7213	8.271	2.87594	5

```
RELIABILITY
  /VARIABLES=H48 H49 H50 H51 H52 I53 I54 I55 I56 I57
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=SCALE
  /SUMMARY=TOTAL.
```

Reliability

Notes

Output Created		16-OCT-2016 18:28:48
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
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	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.

Syntax		RELIABILITY /VARIABLES=H48 H49 H50 H51 H52 I53 I54 I55 I56 I57 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA /STATISTICS=SCALE /SUMMARY=TOTAL.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	61	100.0
	Excluded[a]	0	.0
	Total	61	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.893	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
H48	35.0164	14.583	.556	.888
H49	35.0328	13.866	.636	.883
H50	35.0984	13.590	.556	.888
H51	35.0164	14.050	.560	.887
H52	34.9672	14.999	.396	.896
I53	35.1148	12.903	.711	.877
I54	35.1967	12.827	.700	.878
I55	35.2623	12.897	.714	.877
I56	35.2295	12.680	.838	.868
I57	35.2131	12.704	.686	.879

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
39.0164	16.483	4.05993	10

```
COMPUTE MeanSP=Mean(H48,H49,H50,H51,H52,I53,I54,I55,I56,I57).
EXECUTE.
COMPUTE MeanMSP=Mean(B1,B2,B3,B4,B5,B6,B7,B8,B9,B10,B11,B12).
EXECUTE.
COMPUTE MeanSSP=Mean(C13,C14,C15,C16,C17,C18,C19,C20,C21).
EXECUTE.
COMPUTE MeanSA=Mean(D22,D23,D24,D25,D26,D27,D28,D29).
EXECUTE.
COMPUTE MeanST=Mean(E30,E31,E32,E33,E34,E35,E36).
EXECUTE.
COMPUTE MeanJS=Mean(F37,F38,F39,F40,F41,F42).
EXECUTE.
COMPUTE MeanWSP=Mean(G43,G44,G45,G46,G47).
EXECUTE.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT MeanSP
  /METHOD=ENTER MeanMSP MeanSSP MeanSA MeanST MeanJS MeanWSP
  /SCATTERPLOT=(*ZRESID ,*ZPRED).
```

Regression

Notes

Output Created		16-OCT-2016 19:02:18
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.

	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT MeanSP /METHOD=ENTER MeanMSP MeanSSP MeanSA MeanST MeanJS MeanWSP /SCATTERPLOT=(*ZRESID ,*ZPRED).
Resources	Processor Time	00:00:02.22
	Elapsed Time	00:00:02.17
	Memory Required	4476 bytes
	Additional Memory Required for Residual Plots	200 bytes

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	MeanWSP, MeanJS, MeanSA, MeanSSP, MeanST, MeanMSP[b]	.	Enter

a. Dependent Variable: MeanSP

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.874[a]	.764	.738	.20794

a. Predictors: (Constant), MeanWSP, MeanJS, MeanSA, MeanSSP, MeanST, MeanMSP

b. Dependent Variable: MeanSP

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.555	6	1.259	29.122	.000[b]
	Residual	2.335	54	.043		
	Total	9.890	60			

a. Dependent Variable: MeanSP

b. Predictors: (Constant), MeanWSP, MeanJS, MeanSA, MeanSSP, MeanST, MeanMSP

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.284	.335		.846	.401
	MeanMSP	.227	.124	.245	1.832	.072
	MeanSSP	.393	.123	.400	3.184	.002
	MeanSA	-.061	.038	-.127	-1.574	.121
	MeanST	.145	.075	.213	1.929	.059
	MeanJS	.232	.054	.302	4.318	.000
	MeanWSP	-.020	.085	-.028	-.230	.819

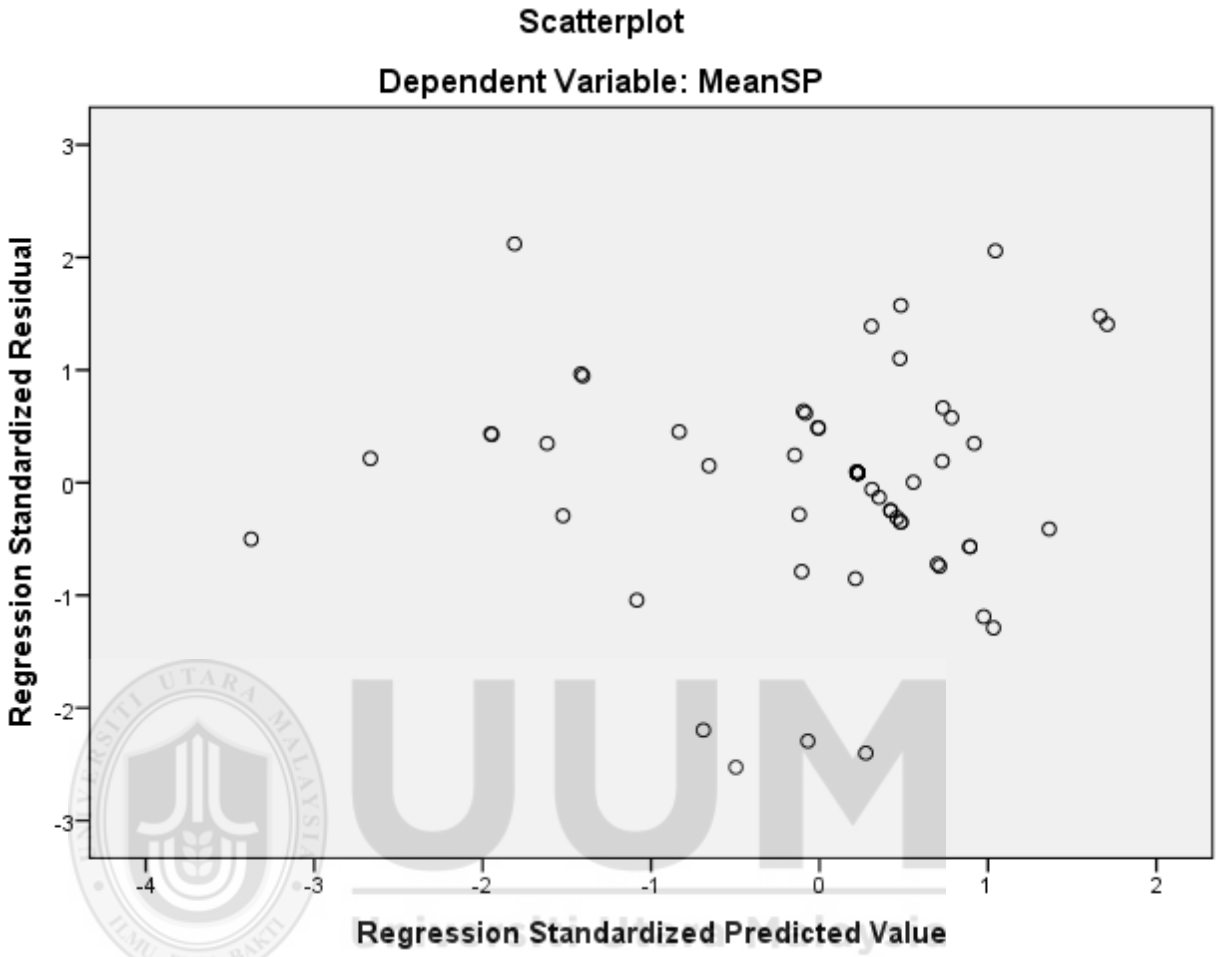
a. Dependent Variable: MeanSP

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.7042	4.5077	3.9016	.35485	61
Residual	-.52543	.44086	.00000	.19727	61
Std. Predicted Value	-3.375	1.708	.000	1.000	61
Std. Residual	-2.527	2.120	.000	.949	61

a. Dependent Variable: MeanSP

Charts




```
DESCRIPTIVES VARIABLES=MeanSP MeanMSP MeanSSP MeanSA MeanST MeanJS MeanWSP
  /STATISTICS=MEAN STDDEV MIN MAX.
```

Descriptives

Notes

Output Created		16-OCT-2016 19:16:49
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=MeanSP MeanMSP MeanSSP MeanSA MeanST MeanJS MeanWSP /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
MeanSP	61	2.60	4.80	3.9016	.40599
MeanMSP	61	2.25	4.67	3.8921	.43815
MeanSSP	61	2.89	4.56	3.9071	.41285
MeanSA	61	1.00	4.50	2.6189	.85191
MeanST	61	2.00	4.86	3.8056	.59535
MeanJS	61	2.17	4.67	3.7869	.52891
MeanWSP	61	2.00	4.80	3.7443	.57519
Valid N (listwise)	61				

```
FREQUENCIES VARIABLES=Umur Jantina Warganegara Jawatan
  /PIECHART FREQ
  /ORDER=ANALYSIS.
```

Frequencies

Notes

Output Created		16-OCT-2016 19:25:56
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61

Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=Umur Jantina Warganegara Jawatan /PIECHART FREQ /ORDER=ANALYSIS.
Resources	Processor Time	00:00:01.66
	Elapsed Time	00:00:01.55

Statistics

		Umur	Jantina	Warganegara	Jawatan
N	Valid	61	61	61	61
	Missing	0	0	0	0

Frequency Table

Umur

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	15	24.6	24.6	24.6
	31-40	36	59.0	59.0	83.6
	41-50	5	8.2	8.2	91.8
	>50	5	8.2	8.2	100.0
	Total	61	100.0	100.0	

Jantina

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lelaki	57	93.4	93.4	93.4
	Perempuan	4	6.6	6.6	100.0
	Total	61	100.0	100.0	

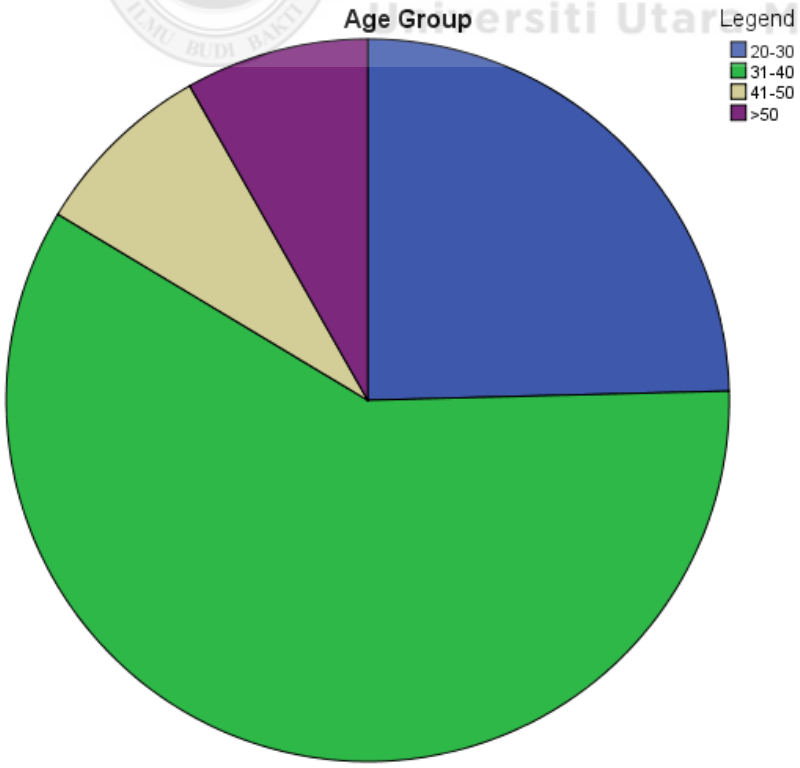
Warganegara

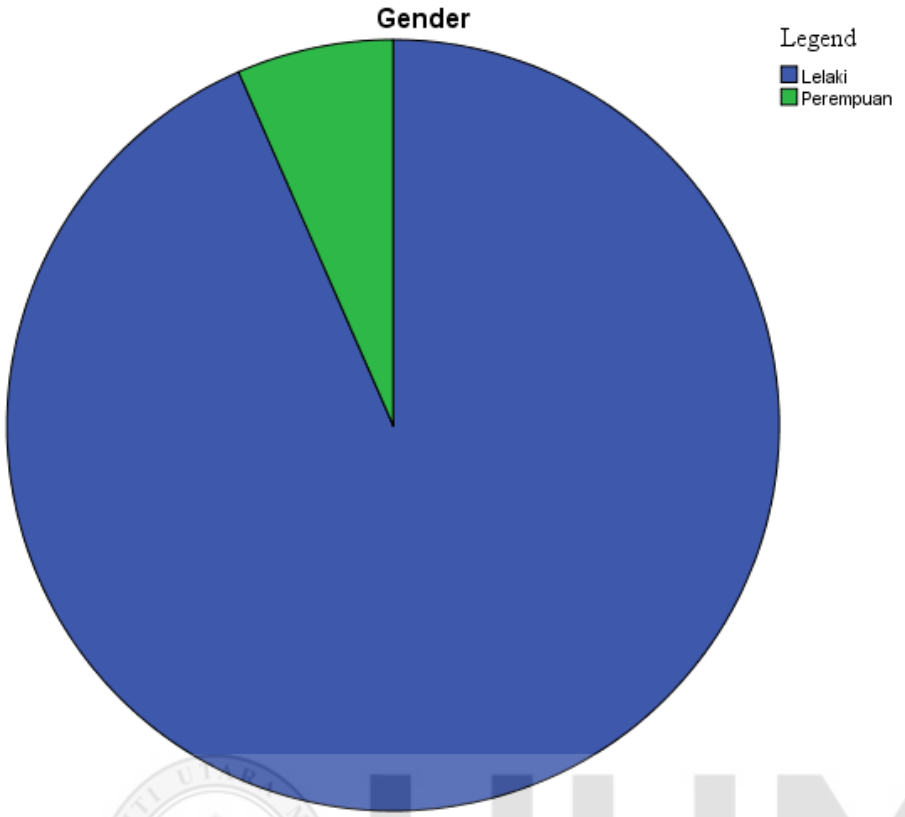
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Malaysia	43	70.5	70.5	70.5
	Bukan Malaysia	18	29.5	29.5	100.0
	Total	61	100.0	100.0	

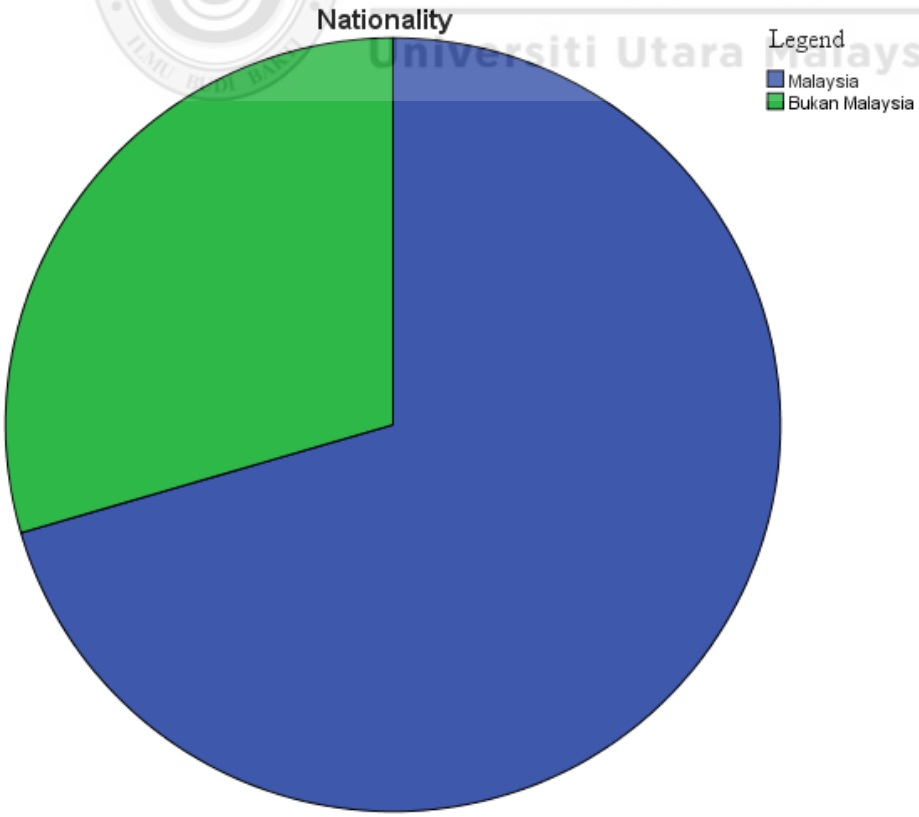
Jawatan

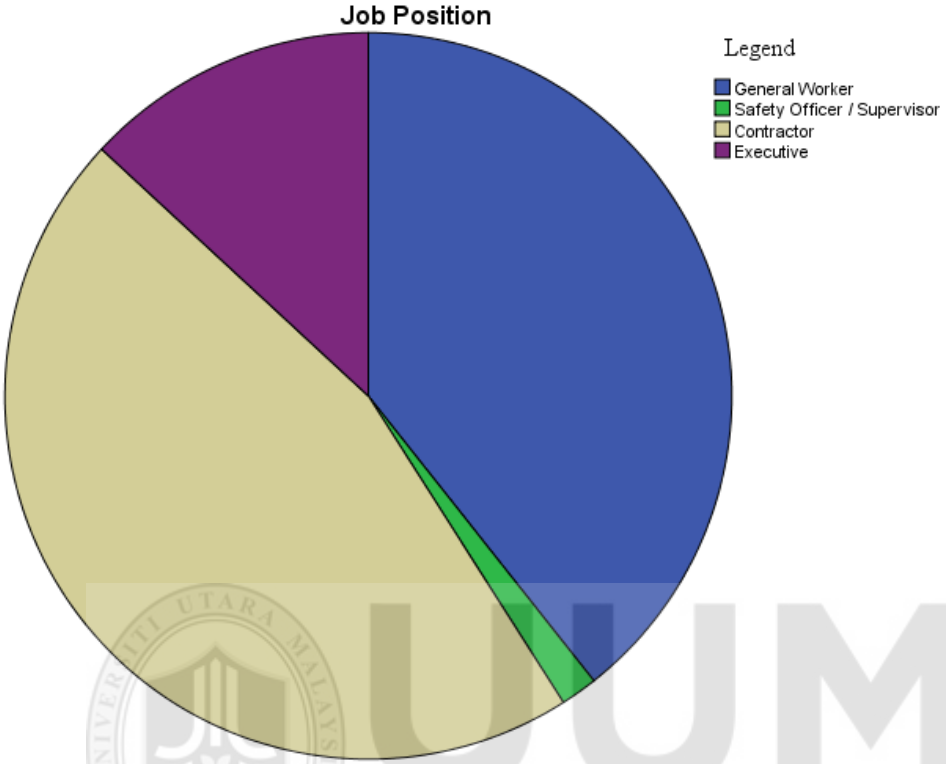
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pekerja Am	24	39.3	39.3	39.3
	Pegawai Keselamatan/Penyelia	1	1.6	1.6	41.0
	Kontraktor	28	45.9	45.9	86.9
	Eksekutif	8	13.1	13.1	100.0
	Total	61	100.0	100.0	

Pie Chart









```
CORRELATIONS
  /VARIABLES=MeanSP MeanMSP MeanSSP MeanSA MeanST MeanJS MeanWSP
  /PRINT=TWOTAIL NOSIG
  /STATISTICS DESCRIPTIVES
  /MISSING=PAIRWISE.
```

Correlations

Notes

Output Created		16-OCT-2016 19:29:52
Comments		
Input	Data	C:\Users\User\Desktop\VINO3.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	61
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each pair of variables are based on all the cases with valid data for that pair.

Syntax		CORRELATIONS /VARIABLES=MeanSP MeanMSP MeanSSP MeanSA MeanST MeanJS MeanWSP /PRINT=TWOTAIL NOSIG /STATISTICS DESCRIPTIVES /MISSING=PAIRWISE.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Descriptive Statistics

	Mean	Std. Deviation	N
MeanSP	3.9016	.40599	61
MeanMSP	3.8921	.43815	61
MeanSSP	3.9071	.41285	61
MeanSA	2.6189	.85191	61
MeanST	3.8056	.59535	61
MeanJS	3.7869	.52891	61
MeanWSP	3.7443	.57519	61

Correlations

		MeanSP	MeanMSP	MeanSSP	MeanSA	MeanST	MeanJS
MeanSP	Pearson Correlation	1	.739**	.777**	-.250	.689**	.374**
	Sig. (2-tailed)		.000	.000	.052	.000	.003
	N	61	61	61	61	61	61
MeanMSP	Pearson Correlation	.739**	1	.830**	-.033	.731**	.068
	Sig. (2-tailed)	.000		.000	.804	.000	.603
	N	61	61	61	61	61	61
MeanSSP	Pearson Correlation	.777**	.830**	1	-.108	.696**	.100
	Sig. (2-tailed)	.000	.000		.409	.000	.443
	N	61	61	61	61	61	61
MeanSA	Pearson Correlation	-.250	-.033	-.108	1	-.224	-.122
	Sig. (2-tailed)	.052	.804	.409		.082	.350
	N	61	61	61	61	61	61
MeanST	Pearson Correlation	.689**	.731**	.696**	-.224	1	.033
	Sig. (2-tailed)	.000	.000	.000	.082		.803
	N	61	61	61	61	61	61
MeanJS	Pearson Correlation	.374**	.068	.100	-.122	.033	1
	Sig. (2-tailed)	.003	.603	.443	.350	.803	

	N	61	61	61	61	61	61
MeanWSP	Pearson Correlation	.681**	.647**	.667**	-.455**	.703**	.252*
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.050
	N	61	61	61	61	61	61

Correlations

		MeanWSP
MeanSP	Pearson Correlation	.681**
	Sig. (2-tailed)	.000
	N	61
MeanMSP	Pearson Correlation	.647**
	Sig. (2-tailed)	.000
	N	61
MeanSSP	Pearson Correlation	.667**
	Sig. (2-tailed)	.000
	N	61
MeanSA	Pearson Correlation	-.455**
	Sig. (2-tailed)	.000
	N	61
MeanST	Pearson Correlation	.703**
	Sig. (2-tailed)	.000
	N	61

MeanJS	Pearson Correlation	.252*
	Sig. (2-tailed)	.050
	N	61
MeanWSP	Pearson Correlation	1
	Sig. (2-tailed)	
	N	61

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).