`

DEVELOPMENT OF OCCUPATIONAL SAFETY AND HEALTH (OSH) PERFORMANCE MANAGEMENT FRAMEWORK FOR INDUSTRIES IN MALAYSIA

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A thesis submitted in
fulfilment of the requirement for the award of the
Doctor of Philosophy

Faculty of Engineering Technology
Universiti Tun Hussein Onn Malaysia

JULY 2022

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DEDICATION

For my beloved mother and late father; my beloved sister and late brother

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ACKNOWLEDGEMENT

All Praise to ALLAH S.W.T the Almighty, for giving me the blessing, the strength, the chance and endurance to complete this study.

First and foremost, I would like to express my deep gratitude to my research supervisor, Prof. Dr. Abdul Mutalib bin Leman. Thank you for his valuable guidance, advise, support and sharing of knowledge given to me in completing this research. Apology also goes to his for any inconvenience brought to his during the entire period of this research. In additional, sincere appreciation is dedicated to all the respondents, who had generously spent their precious time to participate in completing the questionnaire of this research. Without it, I would not be able to conclude and complete this research.

I would also like to take this opportunity to thank all my family members and friends especially Dr. Norlia Goolamally for their prayers, great support and encouragement for me to complete this research. Million thanks to all. Last but never the least, thank you to Faculty Engineering Technology staffs for their continuous support throughout my years of study in UTHM.

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ABSTRACT

Each organisation should track occupational safety and health (OSH) performance to ensure that safety and health regulations are being followed and employers can address OSH concerns before they become a serious issue that affects everyone in the organisation. The purpose of this research is to build a framework for managing occupational safety and health performance based on Edgar Schein's organisational culture model and system theory of accident causation. This is a quantitative research study that utilises a questionnaire and is built based on the Occupational Safety and Health Act (OSHA) of 1994, ISO 45001:2018, and pertinent literature reviews. Eight industrial and academic specialists evaluated the questionnaire. The study employs purposive sampling of OSH competent individuals and OSH practitioners from companies covered by Schedule 1 OSHA 1994. The analysis included a total of 300 respondents. The Structural Equation Modelling (SEM) version 23 and the Statistical Package for the Social Sciences (SPSS) version 17 were used for data analysis, which included correlation, regression, and goodness of fit tests. The findings indicated that OSH leadership, support for OSH management, a risk reduction programme, and employees' OSH values all had a positive correlation with OSH performance. Additionally, mediators in the OSH performance management framework included OSH management support and risk reduction programmes, while the availability of OSH management systems acted as a moderator. Thus, the research successfully developed an OSH performance management framework that included seven OSH values and was transformed into an OSH balanced scorecard to enable employers to self-regulate OSH practises; achieve the preventive culture envisioned in the OSH Master Plan 2020; and embrace business sustainability.

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ABSTRAK

Setiap organisasi harus mengukur prestasi keselamatan dan kesihatan pekerjaan (KKP) untuk jaminan pematuhan dasar yang berkaitan dengannya. Ia juga cerminan majikan dalam memperbaiki isu berkaitan KKP sebelum isu menjadi serius dan menjejaskan semua pihak di dalam organisasi. Oleh itu, tujuan penyelidikan ini adalah untuk membina rangka kerja mengurus prestasi KKP berdasarkan teori sistem tentang punca kemalangan dan model budaya organisasi Edgar Schein. Penyelidikan kuantitatif melalui soal selidik dalam kajian ini dibina berdasarkan kepada Akta Keselamatan dan Kesihatan Pekerjaan (AKKP) 1994, ISO 45001:2018 dan berpandukan ulasan literatur lepas yang berkaitan. Set soal selidik yang digunakan dalam kajian ini telah disahkan oleh lapan pakar industri dan akademik. Pensampelan bertujuan di kalangan orang kompeten KKP dan pengamal KKP daripada industri adalah mengikut Jadual 1 AKKP 1994. Ia melibatkan 300 responden yang dianalisa menggunakan Pemodelan Persamaan Struktur (SEM) versi 23 dan Pakej Statistik untuk Sains Sosial (SPSS) versi 17. Analisis korelasi, regresi dan ujian kebaikan analisis adalah indikator utama prestasi ujian dalam kajian kuantitatif ini. Keputusan menunjukkan bahawa kepimpinan KKP, sokongan pengurusan KKP, program pengurangan risiko dan nilai KKP pekerja mempunyai korelasi yang positif terhadap prestasi KKP. Di samping itu, sokongan pengurusan KKP dan program pengurangan risiko didapati sebagai pengantara manakala ketersediaan sistem pengurusan KKP bertindak sebagai moderator dalam rangka kerja pengurusan prestasi KKP. Oleh itu, penyelidikan ini berjaya membangunkan rangka kerja pengurusan prestasi KKP yang merangkumi tujuh nilai KKP yang berpotensi untuk diubah suai menjadi kad skor seimbang KKP. Berbantukan kad skor cadangan kajian ini, majikan berupaya untuk mengawal selia amalan KKP di dalam organisasi; selaras dengan Pelan Induk KKP 2020; dan menyokong perniagaan yang mampan.

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LIST OF ABBREVIATIONS

AIC	-	Akaike's Information Criterion
AGFI	-	Adjusted Goodness of Fit Index
ASSE	-	American Society of Safety Engineers
AVE	-	Average Variance Extracted
BTS	-	Bartlett's Test of Sphericity
CAIC	-	Consistent Akaike's Information Criterion
CEO	-	Chief Executive Officer
CFA	-	Confirmatory Factor Analysis
CFI	-	Comparative Fit Index
Covid-19	-	Coronavirus disease 2019
CST	-	Climate Survey Tool
CVF	-	Competitive Values Framework
DNA	-	Deoxyribonucleic acid
DOSH	-	Department of Occupational Safety and Health
ECVI	-	Expected Cross Validation Index
EFA	-	Exploratory Factor Analysis
ESENER	-	European Survey of Enterprises on New and Emerging Risks
ESV	-	Employees OSH Values
FMA	-	Factories and Machinery Act
HSMS	-	Health and Safety Management Systems
IAEA	-	International Atomic Energy Agency
ICC	-	Intra-class Correlation Coefficient
ICMM	-	International Council on Mining and Metals
IFI	-	Incremental Fix Index
ILO	-	International Labour Organisation
INSAG	-	International Safety Advisory Group

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IOSH UK	-	Institution of Occupational Safety and Health United Kingdom
ISSA	-	International Social Security Association
KKP	-	Keselamatan dan Kesihatan Pekerjaan
KMO	-	Kaiser-Meyer-Olkin
KPIs	-	Key Performance Indicators
KUD	-	Village Unit Cooperatives
LILAC	-	Leadership, Involvement, Learning, Accountability and Communication
L_OSH	-	OSH Leadership
MS_OSH	-	OSH Management Support
NFI	-	Normed Fit Index
NNFI	-	Non-Normed Fit Index
OBSC	-	OSH Balanced Scorecard
OH&S	-	Occupational Health & Safety
OKPIs	-	OSH Key Performance Indicators
OSH	-	Occupational Safety and Health
OSHA	-	Occupational Safety and Health Act
OSHMP	-	Occupational Safety and Health Master Plan
OSHMS	-	OSH management systems
OSHPM	-	OSH performance management
PAF	-	Principal Axis Factoring
PDCA	-	Plan, Do, Check and Act
PEA	-	Procurement Executives' Association
PGFI	-	Parsimony Goodness of Fit Index
PNFI	-	parsimonious normed fit index
PPE	-	Personal Protective Equipment
RFI	-	Relative Fit Index
RMR	-	Root Mean Square Residual
RMSEA	-	Root Mean Square Error of Approximation
RR_OSH	-	OSH Risk Reduction Programme
SDG	-	Sustainable Development Goals
SEM	-	Structural Equation Modeling

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SOCSO	-	Social Security Organisation
SPSS	-	Statistical Package for Social Sciences
SP_OSH	-	OSH Performance
SRMR	-	Standardised Root Mean Square Residual
SSM	-	Companies Commission of Malaysia
TLI	-	Tucker-Lewis Index
TSC	-	Total Safety Culture
UDHR	-	Universal Declaration of Human Rights
US OSHA	-	United States Occupational Safety and Health Administration
UN	-	United Nations
VIF	-	Variance Inflation Factor

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Healthy, productive and motivated workforce is one of the key components in the socio-economic development of enterprises. Obviously, occupational accidents and diseases can have a major impact on productivity, competitiveness and reputation of enterprises (Boileau, 2016). Therefore, business success and sustainability of an organisation is dependent on safety and health (Lee, 2018). Organisation need to go beyond legal compliance in addressing the OSH issues (Azimah *et al.*, 2009). This is due to the people element that having a tendency in engaging in unsafe or safe behavior according to their interpretation and the unsafe behavior that can lead to accidents (Agumba *et al.*, 2011). Hence, there is a need for an organisation to use performance management tool as a channel for effective communication and feedback for both employer and employees in creating an organisation with shared understanding about what is to be achieved and how it is to be achieved, and an approach to managing people that increases the probability of achieving success. Performance management is related to the gaps between the predetermined goals and objectives of the organisation with the actual output of the employees (Samwel, 2018). Therefore, it requires a tool to monitor the organisations performance in terms of achieving these goals. However, according to Petersen (2001), the biggest problem in OSH was the difficulty in measuring an organisations OSH performance. Thus, there is a need to develop an instrument capable of systematically monitoring and measuring OSH performance. Through the use of the instrument, it is then

possible for an organisation to move in the right direction, to oversee whether the OSH performance is progressing well, and to know how intervention programmes can be improved (Tosine & Wedege, 2009). As a result, the business will flourish and be profitable in the long run.

1.2 Background to the study

It is anticipated that by the year 2020, Malaysia would witness significant changes in the country: unity among her various races; a confident people possessing strong moral and ethical values; emergence of a society that is democratic, liberal, caring, economically just and equitable, progressive and prosperous; an economy that is competitive, dynamic, robust and resilient (Islam & Ismail, 2011). In the endeavour to achieve vision 2020, the working community can contribute to the nation by inculcating a caring culture in the society through the establishment of preventive OSH practices in every Malaysian industry; these efforts will raise the workforce's quality of life and bring success and sustainability to the local businesses. Business owners should embrace business sustainability for business longevity. According to Haanaes (2016), it was observed that 62% of executives consider a sustainability strategy necessary to be competitive today, and another 22% think it will be in the future. In addition, worker safety and well-being are critical components of any long-term effort; we cannot claim to be a long-term, ethical, values-based organisation if we harm individuals and disrupt the lives of their families and communities (Vargas, 2018). Therefore, sustainability cannot be achieved by an organisation that does not integrate safety, health and welfare of its employees in the day-to-day business operations as workers are an organisation most vital resource. In addition, sustainability is not just about what is done, but also how it gets done. It is an approach that requires strong leadership: striving for excellence in business operations, and achieving goals beyond regulatory compliance (Occupational Safety and Health Administration, 2016). In brief, business sustainability is about how enterprises adopt business strategies and activities that meet the needs of the business and its stakeholders today, while protecting the mankind and preserving natural resources that will be needed in the future, because accidents and illnesses may cause immeasurable impacts not only on the employees, but the society as a whole. It is

based on the triple bottom line of sustainability, the 3Ps concept; protecting the people and the planet in the pursuit of profit for long-term success and viability.

As workforce is the greatest asset of the organisation many governments and business organisations have responded positively to promoting OSH and injury preventions in particular. Both are key requirements of the Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187), which has seen a steady increase in the ratification numbers since its adoption (International Labour Organisation, 2014). Indeed, on June 7, 2012, Malaysia was the third country in Asia after Japan and South Korea to ratify the International Labour Organisation (ILO) Promotional Framework for Occupational Safety and Health Convention 2006 (C187). The ratification shows that the Malaysian government is serious and committed to putting safety and health first at the workplace to reduce occupational accidents. In line with the ratification, Malaysia also agreed to be monitored by the ILO in matters related to occupational health and safety and to meet its high standards (International Labour Organisation, 2012). In addressing Article 2 (2) of the Promotional Framework for Occupational Safety and Health Convention 2006 (C187), the government crafted the Occupational Safety and Health Master Plan (OSHMP) 2011–2015 as one of the strategies to achieve self-regulation through enforcement. Self-regulation of health and safety within a legal framework was recommended by the 1972 Robens Committee Report. "Tripartism", the involvement of the government, industry and trade union representatives, is emphasised by Robens to promulgate safety and health policies in driving the self-regulation principles. If one of the keys 'partners' fails to fulfil its obligations, for example, if budgetary cuts mean that poor management of the safety and health occurs, the Robens' self-regulatory model collapses (Sirrs, 2015). In displaying the seriousness for Malaysia to create a preventive culture among its workforce, OSHMP 2016–2020 is formulated to espouse the safety and health values so that OSH stay at the heart and mind of every employees. There is strong evidence that a healthy workforce can improve corporate productivity, benefit companies, and benefit national economies, as evidenced by fewer accidents, lower disease prevalence rates, and fewer insurance and compensation claims (Lee, 2018). Consequently, in supporting with the Goal No. 8 of Sustainable Development Goals (SDG) 2030 that is to promote sustained, inclusive and sustainable economic growth, full and

productive employment, and decent work environment for all, Malaysia should aim for zero injury and zero fatality, as all working people deserve a decent work environment. Indeed, "Zero accident vision" is advocated by Zwetsloot *et al.,* (2013a) as the only ethically sustainable long-term goal for safety management. It is not impossible for Malaysia to establish a decently safe work environment, and make efforts to prevent or reduce injuries and illnesses; the country can provide productive employments similar to those in the United Kingdom, if the employers and employees demonstrate commitments to practising a preventive culture.

Zero Injury concept holds a strong safety culture (Zwetsloot *et al.*, 2017). Safety culture provide direction to the organisational structural design and operating procedures to assist in the prevention of accidents and improvement of safety performance (He *et al.*, 2012). Subsequently, Grote (2000) and Cooper (2000) agreed that safety culture is basic assumption that it can affect the attitude and behavior of staffs and it is the belief and value about health and safety problems. Safety culture is about how we do things here and therefore requires excellent safety and health engagement. Anitha (2014) and Crawford *et al.* (2010) highlighted the significant of engagement where it propels organisations to achieve higher shareholder returns, profitability, productivity and customer satisfaction that resulted in organisations success and competitive advantage. Therefore, in view of safety and health, it is vital for organisation to monitor its level of safety and health engagement to measure its level of safety culture. However, according to Håvold (2005), likewise organisational culture, safety culture was an abstract phenomenon and provides freedom for scientists to interpret and measure it. According to Guldenmund (2000), safety climate portrayed the expression of safety culture. Alhemood *et al.* (2004) described that management able to develop strategies for the purpose of continual improvement of work system conditions based on the data analysed from the safety climate survey. In addition, in their study, they develop a safety climate model that has demonstrated goodness as a scientific instrument to measure safety performance and can be recommended for use in future studies. In the study conducted by Yari *et al.* (2019) found that safety climate and the safety culture had a positive impact on each other, So that, with increasing safety climate, the safety culture also increases, and vice versa. Hence, Researcher decided to apply quantitative approach in developing OSH Performance Management Framework using safety climate survey to assist

organisation in self-regulated OSH management practices as aspired by Occupational Safety and Health Act (OSHA) 1994. The framework developed is essential for the employer and employees to formulate the best working rules and procedures related to activities undertaken at the workplace and obliged to the enforced duty provisions (general and specific duties) stipulated in the OSHA 1994 (Rahman, 2015). The framework was based on the 1990 Schein's organisational culture model and the 1978 Firenze's System theory, consists of twenty-one (21) critical leading indicators covering five constructs, namely OSH leadership, OSH management supports, risk reduction programmes, employees OSH values and OSH performance. This is aligned with Guldenmund (2000) that mentions safety climate can be considered as an alternative performance indicator. The development of the framework involves several phases: engaged OSH experts to validate the research instrument items; carried out a pilot run to determine the consistency of items within the chosen constructs; performed the normality test to determine the right statistical analysis is used, ran the exploratory factor analysis (EFA) to explore the underlying relationships between the measured variables (constructs); used the confirmatory factor analysis (CFA) to test whether measures of a construct are consistent with the Researcher's understanding of the nature of that construct; performed the structural equation modelling (SEM) to analyse structural relationships, and undertaken the path-analysis to explore the correlations within a defined network so as to propose the most suitable OSH performance management framework for the industries in Malaysia.

1.3 Problem statement

Despite of Covid-19 pandemic and sharp slowdown in economic activity, until December 2020, there were a total of 6,933 occupational accidents investigated by the Department of Occupational Safety and Health (DOSH). Malaysia top three sectors that contribute to the accidents are manufacturing (4,506); agriculture, forestry and fishery (979); and finance, insurance, real estate and business services (327). Accidents and diseases at work are exceedingly expensive, and they can have a variety of serious direct and indirect impacts and results on workers' lives, their families' lives, and the financial position of businesses. (International Labour

Organisation, 2013). Thus, governments, employers and employees must all endeavour to establish and maintain decent working conditions and a good working environment. Benjamin (2008) specified that decent working environment should include: (a) work should take place in a safe and healthy working environment; (b) conditions of work should be consistent with workers well-being and human dignity; and (c) work should offer real possibilities for personal achievement, self-fulfilment and service to society. Indeed, Adhikari (2015) emphasised that if organisations want to increase the productivity, they should be ready to invest in the safety and health of the employees. Abdul Rahman (2006) also mentioned that healthy and productive workforce should be the focus of OSH. All the citations above proved that occupational accidents prevention is a good for business as well as achieving quality living for society.

Jovanovic (2004) mentioned in preventing accidents, organisation can use engineering controls, protective equipment and technologies, management commitment to and investment in safety, regulatory controls, and education and training. However, even though most industries achieved safety and health improvements in the industry over the past thirty years with Acts and Regulations; better engineering design and equipment; and management system, efforts must be made to find other ways to further improve safety and health in the organisation, since its performance is reaching a plateau (Metzler, 2017). According to Leman and Nor Hidayah (2013), one way to improve workplace safety and health was by measuring the safety and health performance using a practical tool. A practical tool means an instrument that is capable of identifying safety and health barriers so that interventions can be introduced to bring about positive changes or address challenges. Kim *et al.* (2016) mentioned the introduction of a positive safety culture can further reduce the occupational injuries and diseases. Hence, measurement of preventive culture is the answer to improve the OSH performance in the organisations.

Herbert W. Heinrich claimed that roughly 88% of all accidents are made by unsafe acts of people, 10% are made by unsafe conditions, and 2% by the acts of nature. In order to reduce the probability of human errors, we need to increase levels of worker engagement in safety and health activities so that they become more involved in, and aware of their tasks/surroundings and associated risks, as well as

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