

HUMAN VALUES IDENTIFICATION AND ASSESSMENT TOOL
DEVELOPMENT FOR TQM CONTEXT

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This thesis is dedicated to my late parents

And

My beloved wife for her endless love, support and encouragement

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ABSTRACT

There is not a total improvement achieved by companies in implementing total quality management (TQM), where some are seen to be not successful. One of the key factors to achieve the intended results is human factors, especially human values which are critical and potential resource for the successful implementation of TQM. These values have been overlooked in past that need to be identified in real situation and should be aligned while implementing TQM practices. Despite the number of publications on the importance of human values for TQM implementation, little research has emphasized the relevant and required human values. There is also no consensus on the techniques and procedure to identify these values in real situation. A software tool that could identify human values for TQM implementation and provide assessment of the identified values is crucial. This helps the management to shape and implement TQM practices more effectively. It is believed that there is a lack of such tool that can identify the relevant human values in a real situation that is able to assess their level of practice for TQM implementation. The main objective of this study is to develop an automated tool for identifying values in a real situation and provide assessment of the level of practice of identified values for TQM implementation. A three techniques ladder, image tagging and storytelling has been proposed based on literature that support the values identification in real situation. In order to validate the proposed techniques and to acquire the industry's response about their practice regarding the human values identification, a survey was conducted among managers of manufacturing companies in Malaysia. The selection was based on the Malaysian Productivity Corporation (MPC) database. Two techniques of image tagging and storytelling were found to be highly important and were then used as key techniques for identifying relevant human values for TQM implementation. A human value identification and assessment (HVIA) tool was then proposed based on values identification techniques and a multi rated criteria. The multi rated criteria was adapted to assess the level of practice of identified human values for each TQM practice. Subsequently, the HVIA tool was developed using ASP.Net and MSSQL. A case study was conducted to deploy and validate the tool in industry. The tool can be used by companies for identifying the human values which are relevant and critical to implement TQM practices and to assess their level of practice on the identified human values. It is believed that this prototype tool will be able to enhance TQM implementation.

ABSTRAK

Syarikat-syarikat yang melaksanakan pengurusan kualiti menyeluruh (*TQM*) belum mencapai jumlah peningkatan sebenar, yang mana sebahagiannya dilihat sebagai tidak berjaya. Salah satu faktor utama yang diperlukan untuk mencapai keputusan yang diinginkan adalah faktor manusia, terutama nilai-nilai kemanusiaan yang kritikal dan merupakan sumber berpotensi untuk kejayaan pelaksanaan *TQM*. Nilai kemanusiaan ini telah diabaikan pada masa lalu yang perlu dikenalpasti dalam situasi sebenar dan haruslah diselaraskan untuk pelaksanaan amalan *TQM*. Walaupun terdapat banyak penerbitan tentang kepentingan nilai-nilai kemanusiaan untuk pelaksanaan *TQM* hanya sedikit sahaja penyelidikan yang menekankan kepada mengenal pasti nilai-nilai kemanusiaan yang relevan dan diperlukan. Tiada kesepakatan mengenai teknik dan prosedur untuk mengenal pasti nilai-nilai ini di dalam keadaan sebenar. Alat perisian yang boleh mengenalpasti nilai-nilai kemanusiaan untuk pelaksanaan *TQM* dan memberi penilaian terhadap nilai-nilai yang telah dikenalpasti adalah penting. Ini membantu pihak pengurusan untuk membentuk dan melaksanakan amalan *TQM* dengan lebih berkesan. Adalah dipercayai bahawa alat tersebut mempunyai kekurangan di dalam mengenal pasti nilai-nilai kemanusiaan yang berkaitan situasi sebenar bagi menilai tahap amalan untuk pelaksanaan *TQM*. Objektif utama kajian ini adalah untuk membangunkan alat automatik bagi mengenal pasti nilai-nilai dalam situasi sebenar dan menyediakan penilaian tahap amalan nilai-nilai yang dikenalpasti untuk pelaksanaan *TQM*. Tiga teknik iaitu *laddering*, label imej dan teknik penceritaan telah dicadangkan berdasarkan tinjauan literatur bagi menyokong pengenalan nilai dalam situasi sebenar. Bagi mengesahkan teknik yang dicadangkan dan untuk mendapatkan maklum balas industri tentang amalan mereka mengenai pengenalan nilai-nilai kemanusiaan, satu kaji selidik telah dijalankan di kalangan pengurus syarikat-syarikat pembuatan di Malaysia. Pemilihan adalah berdasarkan pangkalan data dari Perbadanan Produktiviti Malaysia (*MPC*). Dua teknik iaitu perlabelan imej dan teknik penceritaan didapati sangat penting dan telah digunakan sebagai teknik utama bagi mengenalpasti nilai-nilai kemanusiaan yang relevan untuk pelaksanaan *TQM*. Satu alat pengenalan dan pentaksiran nilai kemanusiaan (*HVIA*) telah dicadangkan berdasarkan teknik pengenalan nilai serta kriteria pelbagai kadar. Kriteria pelbagai kadar telah disesuaikan untuk menilai tahap amalan nilai-nilai kemanusiaan yang dikenalpasti bagi setiap amalan *TQM*. Seterusnya, alat *HVIA* dibangunkan menggunakan *ASP.Net* dan *MSSQL*. Satu kajian kes telah dijalankan untuk melaksana dan mengesah alat ini di dalam industri. Alat ini boleh digunakan oleh syarikat-syarikat untuk mengenalpasti nilai-nilai kemanusiaan yang relevan dan kritikal untuk melaksanakan amalan *TQM* serta menilai tahap amalan nilai-nilai yang dikenalpasti. Adalah dipercayai bahawa alat prototaip ini akan berupaya meningkatkan pelaksanaan *TQM*.

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LIST OF ABBREVIATIONS

ADO.Net	-	ActiveX Data Objects
ASP.Net	-	Active Server Pages .Net
IT	-	Information Technology
SME	-	Small to Medium Sized Enterprise
SPSS	-	Statistical Package for Social Science
SQL	-	Structured Query Language
MSSQL	-	Microsoft Structured Query Language
TQM	-	Total Quality Management
MPC	-	Malaysian Productivity Corporation
VS	-	Visual Studio
IIS	-	Internet Information Services
GUI	-	Graphical User Interface
HVIA	-	Human Values Identification and Assessment
ERD	-	Entity Relationship Diagram

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CHAPTER 1

INTRODUCTION

1.1 Background of Research

Total quality management (TQM) implementation has become increasingly important issue amongst industries. Many companies are directing their resources to explore ways towards its successful implementation. There is a growing awareness of the need to consider the human involvement and its associated factors such as human values for TQM implementation (Balvir, 2009; Moccia, 2008). Developing approaches to explore these human associated factors for TQM implementation has been regarded as critical (Dahlggaard-Park, 2012, Ingelsson *et al.*, 2012).

TQM is a holistic management philosophy and a set of practices that focuses to involve all members of organization for continuous improvement. In fact, the word of total in TQM means the total involvement of individual and cultivating the responsibility of everyone in the organization to implement quality (Fotis, 2007; Pfeffer and Veiga, 1999). Therefore, the individual level is considered as indispensable facet to enhance the implementation of TQM successfully (Moccia, 2008).

In recent years, many companies are facing challenges for implementation of TQM (Erturk, 2012; Coyle-Shapiro *et al.*, 2003). In particularly, implementation of TQM has certainly become one of the critical issues in manufacturing companies. They are striving for efficient production and competitiveness through the

implementation of TQM (Balvir, 2009; Fotis, 2007). Although many companies have improved by implementing TQM, but not all of them are obtaining the successive results (Coyle-Shapiro *et al.*, 2003). To achieve the intended results, human and its associated factors such human values are critical which have been overlooked in past (Balvir, 2009; Moccia, 2008).

Human values are the personal tacitly held belief and center the characteristics of individual (Chandrakumara, 2011; Schwartz, 2005). It refers to the set of principles that guide actions, attitude and behaviour such as personal growth, security, loyalty, trust, helpful, privacy, warm relationship and others. In this study, researcher defines human values as set of principles that sets the criteria based on event and situation to guide actions, attitude and behaviour.

Human values are the broad basic preference of desired actions (Schwartz, 2005; Schwartz and Boehnke, 2004). These human values have a large influence on attitude and behavior of an individual. They are the key driving source that sets the criteria to act and behave (Chandrakumara, 2011). These values become the guiding philosophy for desirable or preferable behavior that generally required involving and implementing in the practices of organization (Fritzsche and Oz, 2007; Schwartz, 1994; Rokeach, 1973).

Understanding the importance of human for TQM implementation, human values such as honesty, dedication, commitment and others are considered potential resource for enhancing quality implementation (Dahlgaard-Park, 2012; Ingleson *et al.*, 2012; Waldman, 1994). These values are indispensable elements for the successful implementation of TQM (Balvir, 2009; Dahlgaard-Park, 2012), as they provide hands on practice for individuals to implement quality (Chandrakumara, 2011). Implementation of TQM cannot be achieved until human values are aligned towards quality practices (Erturk, 2012; Moccia, 2008).

The human values are one of the key aspects in the success of TQM implementation. Every single job or operation to implement quality in the

organization is executed by the human with or without help of machines. Their human values in action are critical to explored and need to be aligned for TQM implementation (Dahlgaard and Dahlgaard, 2006; Fotis, 2006; Moccia, 2008), especially structuring, formulating and implementing practices of TQM (Dahlgaard-Park, 2012; Erturk, 2012; Siltaoja, 2009).

Identification of the human values in real situation is critical (Pommeranz *et al.*, 2012; Siltaoja, 2009). These values do not exist in isolation; rather they are associated with real situation (Pommeranz *et al.*, 2012; Maio, 2010). Real situation refers to set of circumstances in a practical field in which one finds oneself. For example working environment, workplace etc. Individual working in real situations required certain human values to perform tasks. While real situation varies, required human values also tend to vary in terms of priority or preferences according to the situations. This demand to notice the importance of human values exploration in real situation as it may differs to the hypothesized list of human values.

Various human values and their measurement instruments have been described by social psychology researchers (Jaffe and Scott, 2004; Schwartz, 2005; Rokeach, 1973), which they asked people to rate or rank values. However, these human values measure were based on that list that has been generated from the literature asking people to rank or rate that does not represents the real working environment of the respondents, rather highlights respondents' personality or preference towards life (Pommeranz *et al.*, 2012). As a result, hypothesized values generated which are not representative of the real situations and less practical (Ingelsson *et al.*, 2012; Siltaoja, 2009).

An automated software tool is a useful and efficient instrument for capturing real situation based values (Ingelsson *et al.*, 2012; Siltaoja, 2009). Recently, human values identification in real situation has been proposed in the area of software engineering by Pommeranz *et al.* (2012). They have proposed an initial conceptual design of a tool for stakeholders' values identification and communication among stakeholders and designers of software development team.

However, to the researcher's best knowledge, there is no study or a tool that identifies the relevant human values in real situation for TQM implementation. Lack of such tool generates difficulty for management to obtain awareness on the required human values and to shape TQM implementation effectively. It also posits difficulty for management to assess their current practice level for identified human values, if there is no such tool. Thus, it is believed that there is a need of research that could focus on identification of human values in real situation and assessing their practicing level for implementation of TQM.

1.2 Problem Statement

Implementation of TQM has certainly become critical issue and human involvements with the relevant human values are core for implementation of TQM (Coyle-Shapiro *et al.*, 2003). Although the literature on the importance of human values for TQM implementation is abundant and growing (Balvir, 2009; Dahlgaard and Dahlgaard, 2006; Fotis, 2006), very few studies have actually provide directions to identify and incorporate the relevant and essentially required human values in real situation (Pommeranz *et al.*, 2012; Siltaoja, 2009).

Mostly studies have performed identification of human values based on social scientist given list of values which are out of real context (Schwartz, 2005, Rokeach, 1973), not representing the actual situation rather representative of hypothetical and unrealistic human values (Pommeranz *et al.*, 2012). Identification of human values in real situation is more usable, realistic and practical that may result differently as compare to hypothesized human values. This research in real situation based identification of human values is critical to provide awareness about the importance of human values for TQM implementation and need to be explored that how human values can be identified in the organizations.

As if such values identification process continues out of real situation, it creates challenges and difficulties for management to understand about relevant and

required human values that their employees needed while performing quality practices. It also posits difficulty for them to assess their practicing level of relevant human value for TQM implementation. It also creates challenge for them to formulate strategies for internalization and reinforcement of relevant human values among existing and new employees. Thus, it is believed that there is a need for the development aspect of any approach that can identify human values in a real situation for TQM implementation and help management to provide assessment for the practice level of the identified human values.

A software tool is useful and efficient instrument for identification of human values in real situation for TQM implementation (Pommeranz *et al.*, 2012). Such tools can help to elicit human values with by incorporating those techniques that well support human values identification in real situation. There is a little research has been done in the area of software engineering, but there is yet an instrument required to describe the development of system to identify and assess human values in real situation for quality implementation in TQM context. In the researchers best knowledge, no such tool exists that can identify the relevant and required human values for TQM implementation, and provide assessment to their practice level in the organization. The research is necessary on the development aspect of human values in TQM context. Thus, focus of this research is to develop a software tool for human values identification, and assessment of the practice level of identified human values for TQM implementation.

1.3 Aim of Study

This study aims to assist the management of organization to identify relevant human values required for TQM implementation and also assess practice level of the identified human values for TQM implementation.

1.4 Research Question

The study comprises of following research questions.

- (i) What are the real situations based human values for implementation of TQM practices?
- (ii) How can the real situation based identified human values be assessed for implementation of TQM practices?

1.5 Research Objectives

The study has the following objectives that provide guidance and boundary of this research.

- (i) To investigate the importance of human values for TQM implementation.
- (ii) To identify the techniques that support human values identification in real situation and their assessment.
- (iii) To develop an automated tool for identification and assessment of human values in real situation for TQM implementation.
- (iv) To evaluate the usability of human values identification and assessment tool.

1.6 Scope of Study

The scope of study outlines the research activities and bound them to provide a focus of the research and clearly defined boundaries.

- (i) Human values identification techniques used in this research were initially selected from the literature that well supports the identification of human values in real situation, and then later reviewed by industry.
- (ii) A survey was conducted among the managers of automobile manufacturing companies of Malaysia who are involved in TQM implementation. This was ensuring by contacting the companies based on the database of Malaysia Productivity Corporation (MPC).
- (iii) A software tool was developed in ASP. Net using C# programming language and database was made possible using Microsoft SQL Server.
- (iv) This research tool was designed and developed on .Net platform, specifically visual studio (VS) 2010. Furthermore, the testing of this tool was made possible through configuring the internet information services (IIS).
- (v) The tool deployment was made possible through registering a domain named as www.hviatool.com on World Wide Web (WWW). The main reason behind this was to approach maximum number of users and provide ease of access for this tool.
- (vi) A case study was conducted on PROTON (Perusahaan Otomobil Nasional Sendirian Berhad) company for deploying and evaluating the software tool.

1.7 Contribution and Significance of Study

This research introduces how human values are important in implementation of TQM practices. It provides evidences that human values have not much explored as part of TQM implementation. Whereas human values of individuals at all levels of organization are important for implementation of quality practices. This research has focused to emphasize the importance of human values and their identification for TQM implementation that adds to the theoretical body of knowledge for TQM

implementation. It provides awareness to the management of organizations to know what employees focused and required in action to perform TQM practices.

This thesis introduces the criticality of indentifying human values in real situation as human values are not isolated, rather deep rooted in real situation and they varies according to the situations. Changes in human values refers to the its importance with subject to the situations such as quality assurance practice required certain human values which could be different with respect to those required for customer focus quality practices. This research significantly highlights the capturing of real situation based identification of human values for TQM implementation and adds to the theoretical body of knowledge in TQM context. It helps managers to know the relevancy of human values required in certain quality practices that could help them to enhance TQM implementation.

This research significantly focused not only on the identification of human values in real situations, but also highlight the importance of assessing the practice level of employee values in the organization. To measure the practicing level of employee human values for each TQM practice in the organization is valuable contribution. It advances not only to the body of knowledge in TQM context, but also for practitioners in industry to be well aware of their practicing status in the organization. It could help management to rethink and formulate their strategies for implementation of TQM practices.

This thesis also contributed to new information on the development aspect of human values in TQM context. It focused on how human values can be identified and assessed in Malaysian manufacturing organizations. This research has accomplished a developed system model as software tools that can capture real situation based human values and assess the practice level of identified human values. It significantly contributes in developing the system that adds to the theoretical body of knowledge and state of practice in TQM context. This could eventually help organizations to enhance the implementation of TQM.

1.8 Thesis Outline

The thesis is structured into seven chapters. The first chapter describes the background of research and the problem statement. It also discusses aim, objectives and the research questions of this research. The scope and contribution of the research is also outlined in detail. The purpose of this chapter is to set a foundation for rest of the thesis. Chapter 2 presents the literature review on TQM and its implementation importance, human values and it's important for TQM implementation, real situation based identification techniques of human values. It also reviews the studies on human values for TQM implementation and discusses research gap. A conceptual framework of this research is also developed and presented in this chapter.

Chapter 3 provides a detail methodology employed in this study. It describes the overall structure of research methodology and the detail explanation of each stage used in this research. This chapter describes the survey methodology and the development of questionnaire including expert validation, population and sampling, reliability and validity. Finally, development of software based tool and the case study approach for deployment and evaluation of tool are explained.

Chapter 4 provides analysis of the survey conducted in this research. It presents the results of the statistical tests performed on the data collected from manufacturing companies selected based on the database of Malaysia Productivity Corporation (MPC). It describes the analysis of the survey that investigates importance of human values, most commonly used techniques currently in industry and the preferred techniques for identification of human values for TQM implementation.

Chapter 5 describes the development of a tool for human values identification and assessment for TQM implementation. It explains the criteria of using human values identification selected techniques through image tagging and storytelling for human values identification module of the tool. It also describe the design of multi

rater assessment criteria for human values assessment module that assesses their practicing level for implementation of TQM practices. It also explains the coding techniques and data cleansing algorithm employed in this research. Furthermore, it explains the interface and database designing of the tool. For interface designing, it illustrates the flow charts for the interface design of each user category of this tool. It also describes the database design through representing the entity relationship diagram (ERD) used in the development of the tool.

Chapter 6 explains the deployment and evaluation of tool in an organization including the testing performed on the tool. It also explains a case study approach for deployment and evaluation of the tool and explains the detail analysis of results. Chapter 7 discusses the overview of results, meaning and importance of findings, and a discussion on the existing research in relation to the findings of the present research. Finally, chapter 8 presents conclusion of this research together with contribution of research, limitation of study and recommendation for future research

1.9 Summary

This chapter has set the basis for the thesis. Among others, it has described the background of the research and described problem statement. Then key research questions with specific objectives are described that helps to guide the research. Research scope and its significance are briefly described and structure of thesis is outlined. The next chapter will present the literature review conducted which form the theoretical basis of this research.

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