



UNIVERSITY OF  
LIVERPOOL

CRITICAL SUCCESS FACTORS (CSFs) OF THE ORGANISATIONAL CHANGE IN  
THE DISRUPTIVE TECHNOLOGY CONVERGENCE OF THE GOVERNMENTAL  
REGULATORY ORGANISATION

Thesis submitted in the accordance with the requirements of the  
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By

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Critical Success Factors (CSFs) of the Organisational Change in the  
Disruptive Technology Convergence of Governmental Regulatory Organisation

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We hereby certify that this Thesis submitted by Pakdee Manaves conforms to acceptable standards, and as such is fully adequate in scope and quality. It is therefore approved as the fulfilment of the Thesis requirements for the degree of Doctor of Business Administration.

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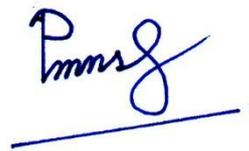
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2021

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Signed

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## ABSTRACT

Critical Success Factors (CSFs) of the Organisational Change in the Disruptive Technology Convergence of the Governmental Regulatory Organisation

by

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The impacts of the disruptive technology convergence of broadcasting and telecommunications is currently considered as the most important critical external factor among other external environmental factors, which is driven by the development of the high-speed internet infrastructure. The governmental regulatory organisation has to adapt to this significant impacts through the organisational change management. However, the studies of both empirical and theoretical as well as experienced based have not identified the Critical Success Factors (CSFs) that provide statistically significant positive relations for a successful organisational change management. If the Critical Success Factors (CSFs) can be identified during the organisational change implementation process, then the organisational change management team can use it to focus more on critical areas that are highly important to implement the organisational change effectively and successfully.

The major objectives of this research are focused on the action research (AR) to (1) develop the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management, (2) develop the new redesign of the business processes of the Business Process Management (BPM), and (3) develop the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM). This research study focuses on the new combined broadcasting and telecommunications licensing bureau of the Office of the National Broadcasting and Telecommunications Commission (NBTC). The mixed method research is used to conduct this action research (AR). The qualitative method is implemented through in-depth and semi-structured interview to nine participants, namely senior directors of the NBTC, senior executives of broadcasting operators, senior executives of telecommunications operators, and a senior academic researcher. The quantitative method to analyse and present the research data using statistical analysis through Excel Computer Software to make the research outcomes be more complete.

The main findings show that the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management consists of four categorized factors include (1) Organisational Critical Success Factors (CSFs), (2) Human Capital Critical Success Factors (CSFs), (3) Operations Critical Success Factors (CSFs), and (4) Technology Critical Success Factors (CSFs). These Organisational Critical Success Factors (CSFs) are classified into three classes include class A:CSFs (most important), class B:CSFs (second most important) and class C:CSFs (third most important). In addition, the outcome of the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) is classified into three classes include class A:KPIs (most important), class B:KPIs (second most important) and class C:KPIs (third most important).

The validation of the acceptability and the usefulness of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and KPIs Taxonomy of the Business Process Management (BPM) results are both highly acceptable to both Organisational Change Management and the Business Process Management (BPM). The validation of the contributions of the proposed Taxonomies to the Organisational Change Management concepts is considered as of a high consistency. Therefore, the proposed Taxonomies provide the benefits to the Organisational Change Management concepts. In addition, the validation of contributions of the proposed taxonomies to the Knowledge Management (KM) is considered as of a high consistency.

The implications of this study show that the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and the Key Performance Indicators (KPIs) Taxonomy provide great benefits and contributions to both theoretical and practical implications. The theoretical implication shows that the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management does not create a new academic theory. However, it does provide a complement to the relevant organisational change management concept in terms of the relationship of the Critical Success Factors (CSFs) and the Organisational Change Management theory. The organisational change management can use the Critical Success Factors (CSFs) Taxonomy as the major focused areas that the organisation must allocate time and critical resources enough for these areas to ensure the successful organisational change implementation. The Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) is complementary to the performance management system and the Business Process Management (BPM) theory. An organisation can use these study results as learning tools to learn new knowledge of the importance and the relationship, and this can enhance the organisational capability to cope with the disruptive technology convergence of broadcasting and telecommunications. Furthermore, the organisation can capture and transfer both explicit and tacit knowledge and experience of the success of the Organisational Change Management and the Business Process Management (BPM) related to the Critical Success Factors (CSFs) and the Key Performance Indicators (KPIs) respectively to other bureaus or to a new generation of employees within their organisation to build up the competence and capability of the Organisational Change Management and the Business Process Management (BPM) as a Knowledge Management (KM) system.

The recommendations for future study are to extend the action research study to other 37 bureaus as well as across the organisation of the NBTC in order to implement both Organisational Change Management and the Business Process Management (BPM) throughout the NBTC completely and successfully. In addition, the future research study should also cover the monitoring, evaluating and taking corrective actions of both proposed taxonomies that might be affected from the dynamic changing disruptive technology convergence of broadcasting and telecommunications. The final recommendation suggests applying this action research study to other organisations in both governmental and private sectors.

**Key words:** Critical Success Factors (CSFs), Organisational Change Management, Business Process Management (BPM), Key Performance Indicators (KPIs)

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## LIST OF ABBREVIATIONS AND DESCRIPTIONS

Items	Abbreviation	Description
1	NBTC	The National Broadcasting and Telecommunications Commission
2	CSFs	Critical Success Factors
3	BPR	Business Process Reengineering
4	BPM	Business Process Management
5	KPIs	Key Performance Indicators
6	KM	Knowledge Management
7	OTT	Over The Top
8	IPTV	Internet Protocol Television
9	MIC	Ministry of Internal Affairs and Communications
10	NCC	National Communications Commissions
11	FCC	Federation Communications Commission
12	OFCOM	The Office of Communications
13	KCC	Korea Communications Commission
14	CRM	Customer Relationship Management

# CHAPTER 1

## INTRODUCTION

Chapter one describes background of the study to identify the statement of the problem. This chapter also describes research questions, research objectives, significant of the study, motivation and role as an insider researcher, and structure of thesis.

### 1.1 Background of the study

The organisational change mostly starts with the dynamic changing of the organisational environment. For example, new government laws and regulations, which affected from new technology dealing with the integrated global supply chain to enhance the superior response long-term supplier-customer relationship. These external factors are grouped in the acronym PESTEL factors include political, economic, social, technological ecological/environment, and legal factors (Deszca, Ingols, and Cawsey, 2020). I agree with the authors that the dynamic changing external environment highly impacts the organisation to adapt for the change through effective organisational change management. Cameron and Green (2020) also commend that most organisational change has occurred as a result of new technology, new organisational strategy, and the changing organisational culture. The organisational change has been increasingly implemented because of the dynamic changing environment, for which the organisations need to enhance their competitive advantage in order to survive and sustain their business. However, a lot of research studies have shown that the research results of the organisational change has failed in about 70% of the organisational change initiatives, and this is considered a very significant failure rate (Burnes and Jackson, 2011). Shin (2005) provides the definition of the disruptive technology convergence of broadcasting and telecommunications to be the convergence of technology that allows both broadcasting services and telecommunications services through the converged networks of broadcasting and telecommunications, which creates ambiguity to the existing technologies and regulatory regimes. Shin (2006) argues that the disruptive

technology convergence of broadcasting and telecommunications is currently considered the most critical external environmental factor among the other external environmental factors, which is driven by the development of interactive digital broadcasting and the availability of the very high-speed internet infrastructure. The telecommunications operators can provide new convergence services through digital technology such as voice, data, and video. The broadcasting operators provide new convergence services such as the interactive services to be able to interact with their customers to enhance the response of their needs. However, the technology convergence of broadcasting and telecommunications impacts not only the operators, but also government regulators. Yovanof and Hazapis (2008) also commend that the disruptive technology convergence of internet communication creates a global platform, which enables innovative products and services. This extends to both opportunities for and threats to the business environment through increasing the highly dynamic competitive environment because of the shifting traditional boundaries. I also believe that the broadcasting operators can take the business opportunities to broadcast their media contents through more platforms of the telecommunication internet networks both local and international markets, which they can increase their revenue and profit significantly. In contrast, the broadcasting operators might face the threats of the international broadcasting competitors such as Netflix, Amazon Prime Video, Hulu, Disney+, YouTube TV, HBO Now / HBO Go, Sling TV, Crunchyroll, Apple TV+, Twitch, and Crackle, which compete internationally including Thailand. Choi (2018) argues that the telecommunications operators have business opportunities to enter into the Internet Protocol television (IPTV), which provides the television content over Internet Protocol (IP) networks. The IPTV is able to stream the source media continuously as known as streaming media. However, the telecommunications operators face the threat of the broadcasting operators entering into the internet business as the bundling package to their current customers . In addition, Yovanof and Hazapis (2008) describe that the convergence in the new disruptive convergence technologies have influenced the broadcasting media, consumer electronics, computer technology, and telecommunications, and has changed society in various ways. including individual expectations and behaviour, leading to a change in the market segmentation and product offerings.

Shin (2005) argues that the technology convergence of broadcasting and telecommunications impacts the international regulatory governmental organisations to adapt for the change. Koh and Lee argue (2010) argue that the various broadcasting and telecommunications convergence services with advanced or unique features, such as Internet protocol TV (IPTV), mobile broadcasting services include satellite multimedia broadcasting (SMDB), and mobile broadcasting services provided through the mobile voice networks. MacKenzie and Wajcman (1999) argue that the disruptive convergence technological change is not an independent process as is assumed by technological determinism, and the market is not the only social institution that influences technology. The interaction of the technological change and regulation defines the actions of the industry players and shapes the architecture of the network and the characteristics of the key technologies. The telecommunications industry provides a good example of how all changes in regulation produce important consequences, in both the organisation of the industry and in technology itself. Trubnikov (2017) commends that the regulations of broadcasting and telecommunications have evolved since the beginning of the industry, and there are continuous efforts to cope with the new issues of the dynamic changing technology. However, it is not only technology that creates problems for policymakers and affects legal norms; but legal norms, in turn, affect the development of technology. Social sciences describe how the regulatory issues of this idea are expressed in the concept of the mutual shaping of technology and society. The disruptive convergence technology in the highly regulated industries can create serious issues as the law has been developing throughout the industry, which is considered as a playing field of the mainstream players, however, the technology is considered as an alternative way of functioning of the field and the old regulations might not be suitable or might even create their own damage.

Lui (2011) argues that the National Communications Commission (NCC), the Taiwanese regulator of broadcasting and telecommunications adopts three-layer framework, which are content/application layer, service/platform layer, and infrastructure layer. Therefore, the NCC has to implement the organisation change as well as the Business Process Management (BPM) to handle the converged broadcasting and telecommunications industry effectively. Lui (2011) also argues that the Ministry of Internal Affairs and Communications (MIC) as the Japanese governmental regulator implements the change to realign eight laws into four laws, which are broadcast act, telecommunication act, radio act, and wire telecommunication act to cope with the

disruptive technology convergence of broadcasting and telecommunications. The MIC also changes the organisational structure and business process to match with the new integrated four laws of the broadcasting and telecommunications acts.

Shin (2005) argues that in USA, the Federal Communications Commission (FCC) is the first to regulate converged broadcasting and telecommunications services. The FCC also implement the organisational change to match with the new converged broadcasting and telecommunications services. The European Union (EU) considers the convergence service as the third service, which is neither broadcasting nor telecommunications service. The EU changes the organisational structure and business process to manage the particular third service. In UK, The Office of Communications (OFCOM) as the governmental regulator of broadcasting and telecommunications implement to the organisational change and business process management (BPM) to cope with the technology convergence of broadcasting and telecommunications services. The UK migrated media ownership restrictions through the Broadcasting Act of 1996 in order to speed up the converged broadcasting and telecommunications services. The communications Act 2002 combines the Independent Television Commission (ITC) and Office of Telecommunications (OFTEL), the two regulators in broadcasting and telecommunications respectively into one converged regulator as OFCOM. In addition, Shin (2005) argues that the Korean Communication Commissions (KCC) as the governmental broadcasting regulator also implements the organisational change as well as to change the business process to handle the disruptive technology convergence effectively.

In Thailand, Lin and Oranop (2016) argue that the National Broadcasting and Telecommunication Act of 2017 consolidates the converged broadcasting and telecommunications together, which used to operate separately since the National Broadcasting and Telecommunications Act of 2010. The National Broadcasting and Telecommunications Commission (NBTC) has to implement several new rules, regulations, business processes, and procedures to cope with the new disruptive technology convergence of broadcasting and telecommunications. I agree with the authors that the converged broadcasting and telecommunications together with the same networks creates a lot of critical issues and problems because these both industries have been operated separately for long time, which the infrastructure networks and regulations have been operated and regulated particularly for each industry. Therefore, the

governmental regulator has to change the rules, regulations, organizational structure, business processes and procedures to match with the new converged broadcasting and telecommunications business process operations. I have been working as the deputy secretary general of the NBTC, which is the governmental regulatory organisation to regulate the broadcasting and telecommunications industry. The organisational structure consists of three units, which are telecommunications, broadcasting, and regional management and regional affairs. The NBTC employs 1,500 employees throughout the country. The broadcasting unit and the telecommunication unit consist of 16 bureaus each, and the regional management and regional affairs unit consists of 9 bureaus. The broadcasting licensing bureau and the telecommunication licensing bureau are the most important interactive function for the broadcasting and telecommunication operators, from giving new licenses, to collecting the annual license fee as well as renewing the licenses. The new disruptive technology convergence of the broadcasting and telecommunication influences the convergence of the broadcasting and telecommunication, and this forces the change of the broadcasting and telecommunication industry to operate across the technological platforms. The new broadcasting and telecommunication legislation has been implemented to combine the broadcasting and telecommunication.

In addition, the new rules, regulations, business processes, procedures, and job assignments have been implemented across the organisations, which highly impact the overall organisational operations. This organisational change is very critical for the organisation to be able to cope with the new disruptive convergence technology of Broadcasting and Telecommunications.

## **1.2 Statement of the problem**

Many of the research outcomes of the organisational change research projects have shown that managing organisational change in the organisations is very complex and there is a high failure rate of the organisational change strategy that aims to achieve the desirable outcome (Van De Van and Pool, 1995). Lewin (1951) was originally a social scientist, deeply interested in solving social conflict by facilitating learning, and became perhaps the world's first researcher into organisational change management. His ideas

are well known in the world of change management and are most closely aligned with the organism metaphor. The organisational change management theory of Lewin (1951) consists of four connected themes: field theory, group dynamics, action research and the three-step model. The three-step model of the organisational change management consists of the first step involves unfreezing the current state of affairs in a way that destabilizes the equilibrium and unleashes some energy of change. The second step is about moving to a new state through participation involvement using an iterative approach such as action research. The third stage focuses on refreezing and stabilizing the new state of affairs which in an organisational context usually means setting new policies, processes and standards. Bruckman (2008) argues that research studies of the organisational change implementation have been conducted for many years and include empirical and theoretical and experience-based studies. The theoretical and experience-based studies provide prescriptions of change, for which the study frameworks are normally anecdotal, theoretical, and intuitively based. In addition, the empirical studies provide factors that are important for the successful organisational change implementation. In addition, Siriphattrasophon and Trang (2011) provide an example from the research study of the organisational change management of the public service organisation in Thailand. The example shows that the competition and deregulation force the organisation to implement the organisational change management in order to survive the competitiveness and the required high quality of public services. The successful organisational change management needs the new organisational structure as well as the new redesign of the business process. The Business Process Management (BPM), employees' engagement and the leadership supports are the Critical Success Factors (CSFs) for successful organisational change management.

However, the studies of both empirical and theoretical as well as experienced based have not identified the Critical Success Factors (CSFs) that provide statistically significant positive relations for a successful organisational change management. If the Critical Success Factors (CSFs) can be identified during the organisational change implementation process, then the organisational change management team can use it to focus more on the critical areas that are highly important to implement organisational change effectively and successfully. There are also many change management researches that argue that the Critical Success Factors (CSFs) are very important for organisational change leaders to identify so as to be more focused on these factors and

to formulate and implement the organisational change strategy to be effective and successful. The Business Process Management (BPM) is considered as one of the most important Critical Success Factors (CSFs) of the organisational change management in term of the disruptive technology convergence impacts (Bruckman, 2008).

Moreover, Rockart (1979) argues that Critical Success Factors (CSFs) are very important for the top management to determine critical information to use it to make high quality decision to manage business effectively and successfully. Fritzenschaft (2011) also argues that it is essential for the for the organisation to identify the Critical Success Factors (CSFs) as well as to use them to develop the most suitable framework to implement the organisational change successfully. I find that the NBTC has not yet identified Critical Success Factors (CSFs) of the Organisational Change Management, and it might lose focus on the critical factors that it must pay most attention to allocate limited resources and time to take effective actions to succeed the change.

In addition, the Critical Success Factors (CSFs) are very critical as these can affect the organisations to successfully achieve their desired performance, or to be in trouble with a poor organisational performance (Chu, 1995). Fritzenschaft (2011) conducts the field study to support that the successful organisational change management requires the Business Process Management (BPM) as the systematic approach to change the business process to support the successful change implementation. I agree with the authors that the successful organisational change management needs to identify as well as to monitor the probability and the impacts of the Critical Success Factors (CSFs) in order to handle the change continuously and effectively. In addition, I also agree that the organisational change to respond the disruptive technology convergence of broadcasting and telecommunications require the effective BPM as one of the most important Critical Success Factors (CSFs) of the organisational change management.

Moreover, Gerdruang and Bunchaphattana (2021) argue that the disruptive technology convergence of the broadcasting and telecommunications in Thailand forces that governmental regulatory body such as Office of the National Broadcasting and Telecommunications Commission (NBTC) to implement the organisational change to become the high performance organisation. The critical factors to achieve the high performance organisation of the NBTC include organisational structure, knowledge

management (KM), organisational culture, technology, employees, leadership, innovation process, organisational strategy, and resources. I agree with the authors that the NBTC must implement the organisational change management in order to cope with the challenging of the disruptive technology convergence of broadcasting and telecommunications that requires the adaptive high performance organisation. In addition, I find that the new combined broadcasting and the telecommunication licensing bureau are the most urgent bureau to focus on the organisational change management and the BPM because it is the most interactive operations with both broadcasting and telecommunications operators. I also find that the major problems of the organisational change of the NBTC, which focuses on the new combined broadcasting and the telecommunication licensing bureau include:

(1) Lack of the identification of the Critical Success Factors (CSFs) of the Organisational Change Management

(2) Lack of the redesign of the business process of Business Process Management (BPM) of the new combined broadcasting and telecommunications licensing bureau

(3) The ineffectiveness and inefficiency of its existing business processes.

(4) The increase of the existing business process cost.

(5) Low productivity of the existing business process.

Therefore, the NBTC must implement the Organisational Change Management to cope with new combined broadcasting and telecommunication licensing bureau in order to enhance the effectiveness, efficiency, cost and productivity of organisation. The Critical Success Factors (CSFs) need to be identified as the management tool for the NBTC to implement and monitor the organisational change successfully. In addition, the Business Process Management (BPM) of the NBTC is considered as one of most important Critical Success Factors (CSFs) of the Organisational Change Management; therefore, the new redesign business processes of the Business Process Management (BPM) must be developed in order to ensure that the BPM action plans are implemented to support the successful organisational change management effectively.

### **1.3 Research questions**

The study of the Critical Success Factors (CSFs) of the Organisational Change Management and Key Performance Indicators (KPIs) of the Business Process Management (BPM) in the disruptive technology convergence of the governmental regulatory organisation, the following questions are formulated and investigated.

1. What are the Critical Success Factors (CSFs) Taxonomy of the NBTC and how to be developed for the NBTC to use as the management tool to monitor the Organisational Change Management?
2. What are the new redesign of the business processes of the Business Process Management (BPM) of the NBTC to support the Organisational Change Management?
3. What are the Key Performance Indicators (KPIs) of the Business Process Management (BPM) of the NBTC?
4. What are the Key Performance Indicators (KPIs) Taxonomy to be developed for the NBTC to use as the management tool to monitor the Business Process Management (BPM) ?

### **1.4 Research objectives**

This action research is aimed at the newly combined broadcasting licensing and telecommunications licensing bureau because it is the most critical interactive function for the broadcasting and telecommunication operators.

These research objectives can be summarized as follows:

1. To develop the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the newly combined broadcasting and telecommunication licensing bureau of the NBTC.
2. To develop the new redesign of the business processes of the Business Process Management (BPM) of the NBTC to support the Organisational Change Management.

3. To develop the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) of the newly-combined broadcasting and telecommunications licensing bureau of the NBTC.

4. To seek for the contributions and usefulness of the Critical Success Factors (CSFs) Taxonomy to the Organisational Change Management and Knowledge Management (KM).

5. To seek for the contributions and usefulness of the Key Performance Indicators (KPIs) Taxonomy of Business Process Management (BPM) to the Organisational Change Management and Knowledge Management (KM).

## **1.5 Significance of the study**

Researchers engaged in organisational change mostly agree that there is no “one size fits all” model for organisational change implementation (Kennedy, 2002). However, a collective review of research conducted in the field of organisational change management indicates there are probably generic Critical Success Factors (CSFs) that have a relationship with the various types of organisational change success. The identification of these Critical Success Factors (CSFs) and the further development of the action plans to monitor the Organisational Change Management through the Critical Success Factors (CSFs) Taxonomy as the management tool for the NBTC, can be very useful in reducing the potential failure of organisational change implementation. In addition, the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) also can be very beneficial as the management tool to monitor the performance of the BPM, which is considered one of the most Critical Success Factors (CSFs) of the Organisational Change Management of the NBTC.

For the NBTC, the significance of reducing the failure of the organisational change implementation has several benefits.

First, the successful organisational change implementation in the NBTC can help the NBTC to be more efficient and effective to achieve their mission of coping with the challenge of the disruptive technology convergence. Second, reducing the failure of the organisational change implementation can help improve the capability of the NBTC to

deliver, as well as improving the confidence of the broadcasting operators, telecommunication operators, and consumers in both the capability and the reputation of the NBTC. Third, reducing the failure of the organisational change implementation of the NBTC can help promote the broadcasting and telecommunications industries to develop and grow sustainably.

## **1.6 Motivation and Role as an insider researcher**

I have the motivation to conduct the action research of Critical Success Factors (CSFs) of the Organisational Change Management in the Disruptive Technology Convergence of the Governmental Regulatory Organisation because the I have been working as a deputy secretary general at the NBTC, which is the governmental regulator of the broadcasting and telecommunications. The new Thailand Broadcasting and Telecommunications Act of 2016 was implemented since 2016, which combined the broadcasting and telecommunications together to respond the disruptive technology convergence of the broadcasting and telecommunications services that used to regulate separately before this act. The NBTC needs to implement the organisational change, which the new organisational structure to combine broadcasting and telecommunications together in year 2019 and the new business processes also need to be redesigned and be implemented ensure the successful organisational change management. I focus on the new combined broadcasting and telecommunications licensing bureau for this action research because this combined business unit is the most complicated function of the NBTC to allocate and renew spectrum licenses for both broadcasting operators and telecommunications operators. Even though, the NBTC already restructured its organisation, but the business process of the new combined broadcasting and telecommunications licensing bureau has not yet redesigned. Therefore, I also have my motivation to develop the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management, new redesign of the business processes of the Business Process Management (BPM), and the Key Performance Indicators (KPIs) Taxonomy of the BPM in order to implement the organisational change of the newly combined broadcasting and telecommunications licensing bureau of the NBTC successfully.

My role as an insider researcher, I aim to conduct the action research (AR) inside the NBTC to collect the data from the in-depth interview of both inside and outside relevant stakeholders, of the NBTC, include the NBTC change management team, senior academic researcher in the field of change management, broadcasting operators and telecommunications operators. Even though, my role as a deputy secretary general of the NBTC, I have management power to control all participants, I strictly follow the action research (AR) code of ethics of the University of Liverpool to give freedom to the participants to provide their actual inputs for this action research (AR) in order to enhance the quality of this research study.

## **1.7 Structure of the thesis**

Chapter 2 incorporates the intensive literature review of Disruptive Technology, Action Research (AR), Organisational Change, Critical Success Factors (CSFs), the Critical Success Factor Methodology, Business Process Management (BPM), Performance Measurement and Management, Key Performance Indicators (KPIs), the Analytic Hierarchy Process (AHP), Knowledge Management (KM), and the relevant theories, concepts, and previous research related to this research study.

Chapter 3 provides the research methodology applied in this study to develop the Critical Success factors (CSFs) Taxonomy of the Organisational Change Management, the new design of the business processes of the Business Process Management (BPM), and the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM), which can be used to monitor the Business Process Management (BPM) as the management tool.

Chapter 4 presents the story of cycles of action, reflections, and sense-making of the research outcomes of the study in a step sequence conducted in the research. This can proceed in two phases. (1) To develop the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the newly combined broadcasting and telecommunications licensing bureau of the NBTC. (2) To develop the new redesign of the business processes of the Business Process Management (BPM) and to develop the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) that can apply to monitor the Business Process

Management (BPM) of the newly combined broadcasting and telecommunications licensing bureau of the NBTC.

Chapter 5 presents the evaluation of the research outcomes through the interview of nine participants for two objectives. (1) The validation of acceptability and usefulness of the proposed taxonomies; and (2) validation of the contributions to relevant management concepts.

Chapter 6 presents the conclusions of the research study in order to answer the research questions. The reflections provide the lesson learned from the research, the implications of both theoretical and practical perspectives, and recommendations for the future research study.

## **1.8 Summary**

The NBTC is facing the impacts of the disruptive technology convergence of Broadcasting and Telecommunications and the new National Broadcasting and Telecommunications Act of 2016 combine broadcasting and telecommunications services together. The NBTC have already restructured its organisation in year of 2019, however, the redesign of the new combined business processes have not yet done. Therefore, the NBTC needs to ensure the success of the organisational change management implementation as well as to redesign the new business processes that support its organisational change strategy and implementation. In this action research (AR), I have my motivation as a deputy secretary general of the NBTC to play role as an insider researcher to conduct the action research to focus on the most critical function of the NBTC, which is the new combined broadcasting and telecommunications licensing bureau. I have strong determination to conduct the action research into two phases: phase (1) to develop the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management to use as the management tool to monitor the Organisational Change Management and phase (2) to develop the new redesign of the Business Process Management (BPM) and the Key Performance Indicators (KPIs) Taxonomy of the BPM that can be used as management tool to monitor the Business Process Management (BPM) performance.

## **CHAPTER 2**

# **LITERATURE REVIEW**

The contribution of literature has been reviewed in line with the motivation to seek Critical Success Factors (CSFs) and the Key Performance Indicators (KPIs) of the Business Process Management (BPM) so as to influence the successful organisational change in the disruptive technology convergence of broadcasting and telecommunications. The literature review also includes the relevant literature relating to disruptive technology, organisational change, critical success factor methodology, performance measurement and management, key performance Indicators (KPIs), the analytical hierarchy process (AHP), and knowledge management (KM). The details of the literature review can be elaborated as follow.

### **2.1 Disruptive technology**

I review the relevant literature of the disruptive technology, which I start from the history and concept of the disruptive technology, as well as its impacts to both private and governmental organisations. I also review the literature of the disruptive technology convergence of the broadcasting and telecommunications. I can use this literature review to design the research methodology and framework. The disruptive technology literature can be described as the following.

#### **Disruptive technology history and concept**

The concept of disruptive innovation and technology was introduced by Christensen and Bower in 1995, and it has been increasingly discussed and researched from that time. Disruptive technology initially applied mainly to the benefits of consumers; however, it has now improved upon and replaced the dominant technology, which has served its mainstream customers a long time. Disruptive technology is defined as

innovation that creates an entirely new market through the introduction of a new kind of service or product (Christensen and Bower, 1995). Moore (2000) argues that disruptive technology is, in total, the change of innovative methodology to do things from a new approach in both doing the job as well as managing the businesses. Dhar and Sundarajan (2007) state that disruptive technology has a high impact on the overall digital economic environment in the unanticipated outcomes. Kassicieeh (2002) defines disruptive technologies as a breakthrough invention that enables organisations to gain a new competitive advantage through the innovative technology capabilities.

However, (Zheng, et al., 2017) argue that disruptive technology does not only mean a technical breakthrough, but also includes business models and business strategies, that seem to relate “disruption” to economic concepts and reflects the disruptive innovation mainly from the view of the economy and society, for which the technology breakthrough is only one component to accomplish the economic goal, its objective and its target. The disruptive innovation helps to create a new business model and an economic value system, which impacts the product innovation and the process innovation. In this way, the disruptive technology is considered as an optional component to develop new markets that will create disruptive challenges and market changes. Furthermore, disruptive innovation has another presence in the military area: the development of disruptive innovation may raise a functional transformation in military force, structure, foundation and energy balance, and then change campaign modes and rules of engagement, this is also known as technology redefining rules. For this reason, disruptive innovation is normally interchangeable with disruptive technology in the military area. Manyika, et al. (2013) argue that disruptive technologies normally show a rapid rate of change in capability in the form of price and performance when compared with the traditional products and services. The potential impact has a broad scope for the companies and industries as well as a wide range of products and services. I agree that the disruptive technology is innovation of new products or services to create new market, for example, the smart healthcare is an example to apply the innovative high speed Internet to communicate online with the patients through the medical equipment to monitor the medical treatment for the patients, who live at the remote area, which is similar to Manyika, et., al. (2013) argue that the Internet of Things (IoT) has potential to create economic value of \$2.7 trillion to \$ 6.2 trillion annually by 2025. The IoT can in various applications include healthcare, infrastructure, and public-sector services. The smart

healthcare can use remote monitoring to monitor people with diseases, which is able to reduce the medical treatment cost significantly. The Internet of Things (IoT) has potential to create economic value of \$2.7 trillion to \$ 6.2 trillion annually by 2025. The IoT can in various applications include healthcare, infrastructure, and public-sector services. The smart healthcare can use remote monitoring to monitor people with diseases, which is able to reduce the medical treatment cost significantly.

Moreover, Manyika, et al. (2013) support that mobile internet is one of the most impactful disruptive technologies, and its impact can influence many sectors. Consumers, organisational executives, and regulators have realized that the mobile internet enhances the organisational capability significantly in terms of faster speed, higher productivity and better services. The producers of the mobile internet have been competing intensively with each other to create and improve innovative and higher performance products and services to maximize their customer satisfaction. Wireless carriers have been facing a difficulty in their profitability from the rapid growth of mobile internet usage. The fierce competition among the wireless carriers had led to a reduced profit margin of the mobile data schemes. The reasons for this squeeze to the profit margin is because the new advanced mobile internet encourages consumers to consume more data, such as by streaming video programming, over the top (OTT), and social media, which is increasingly used, and this causes a slowdown of the internet network system. The wireless carriers must consider the network loading constraints and whether to invest in upgrading the current network system or to leapfrog to enhance the advanced convergence technology. The investment decision must strike a balance between capital investment and long-term profitability. The executives of the organisation must identify the possibility of taking advantage of using the mobile platform to improve their organisational effectiveness and efficiency through the mobile platform to create and to develop workers' knowledge and competence so as to enhance their job functions by accessible social network interaction. In addition, Christensen and Bower (1995) argue that the major reasons that most organisations have a failure in their running of business is because they lack the application of the new advanced technology in their operational processes. I agree that the organisations lack of the new products or services, which applied the new advanced technology are facing the difficulties to compete with their competitors, which introduce the new advanced technology. I found that in broadcasting and telecommunications industry, the organisations that lack of the applied new advanced

technology of the high speed Internet to broadcast their media contents to the OTT cannot compete with organisations that broadcast to the OTT because the new consumer behaviour increases to watch the media content from the OTT significantly.

### **Disruptive technology convergence of broadcasting and telecommunications**

Christensen (1995) argues that the disruptive technology creates significant changes in the broadcasting and telecommunications industries, and this influences the organisation to adapt to gain the benefits of the new challenges, as well as to handle the threats efficiently. Shin (2005, p.48) provides the definition of disruptive technology convergence of broadcasting and telecommunications as “the provision of both broadcasting services and telecommunications service through the converged networks of broadcasting and telecommunications, which brings ambiguity to the existing technologies and regulatory regimes”. In addition, the broadcasting operators and telecommunications operators can provide converged services through the converged networks for example, the cable broadcasting operators can provide high speed internet through their existing cable networks, and broadcasting through the telecommunications networks (Shin, 2005). I find the same in Thailand that many cable broadcasting operators introduce the internet service for their current and new customers as the new business services to increase their sources of revenue through their existing broadcasting networks. At the same time the telecommunications operators also provide IPTV and OTT as their new media broadcasting services through their existing telecommunications networks. Therefore, both broadcasting operators and telecommunications operators can gain the benefits from the new converged services through the converged networks of the disruptive technology convergence of broadcasting and telecommunications.

Kassicieh et al. (2002) commend that the disruptive technology significantly enables the effectiveness of the business procedures of the mobile telecommunication companies as well as enhances their competitive advantage. The research results found that the disruptive technology does not only allow the mobile communication company to gain more competitive advantage, but also enhances customer satisfaction as a result of quicker and better services, and this helps to secure a long-term business relationship. I agree that the disruptive technology such as 5G enables the mobile phone operators to provide more advanced services for their customers such as the Internet of Things (IoT)

for the smart manufacturing, which integrates various manufacturing devices equipped with sensing, identification, processing, communication, actuation, networking capability to enhance faster, higher precision, higher productivity, and higher profitability for the organisation.

Hirschmeier, et al. (2019) argue that the radio broadcasting industry has been greatly affected by the disruptive digital transformation and has been facing drastic changes. The broadcasting agencies have been affected by intensive competition for listeners' interest in the new advanced music streaming services as well as in new media platforms. Spotify accounts for 159 million active listeners in 2017 and 70 million paid subscribers in January 2018, and this is considered as the global market leader for music streaming. Music and video streaming services have a great influence on listeners who have switched from radio broadcasting services as a result of the limited time and attention of these listeners. The disruptive emergence of new technology leads to new customer expectations as part of the new technologies. New radio devices need to be developed to serve the new digital technology, for example an in-car radio must be developed to receive a digital radio, which is totally different from an analog radio. The digital radio is more advanced than an analog radio because it can provide graphics, text, and a voice, compared with an analog radio that can provide only a voice. The safe driving practice of drivers must be considered when they are driving as they will devote less attention if they both listen and watch the content of a digital radio. The governmental regulator must consider implementing safety practices for both in-car radio manufacturers and drivers, in order to oversee the safety of driving. I found the same challenges in Thailand that both digital and Internet radio can provide better and clearer voice quality than the analog radio as well as they can provide visual graphic on the radio monitor to provide additional value added services such as commercial advertisement, weather forecast, emergency warning, and etc.

Manyika, et al. (2013) argue that both policy makers and society as a whole must anticipate and prepare for future technology. In order to cope with the rapid changing technology, they must clearly understand how the new technology will shape the global economy and global society throughout the future decade. They also must learn how to invest in both the essential education and infrastructure in order to cope with the disruptive economic change that will influence the comparative advantages. Governments need to create and nurture a supportive environment so that their people can survive under the

disruptive technologies that influence their lives. Lawmakers and regulators will face the challenge of handling new biological capabilities as well as the rights and privacy of their people. The policy makers throughout the globe need to utilize access to the mobile internet to enhance public services as a smart government concept that will improve government services such as traffic control, healthcare, and spectrum licensing process, and this can improve productivity and satisfaction. Kim (2011) argues that the impacts of the disruptive technology convergence of broadcasting and telecommunications influence the governmental regulatory organisations to reform new technology convergence of broadcasting and telecommunications laws, regulations and restructure their organisations to cope with the technology convergence change. In addition, the governmental regulatory organisations must implement effective organisational change management as well as redesign the business process to match the converged business services. I agree with the author that it is essential for the governmental regulatory organisations to reform the new laws, regulations, organisational restructure as well as the redesign of the business process that can cope with the disruptive convergence technology. The NBTC reforms the new National Broadcasting and Telecommunications of 2016 in order to cope with the disruptive technology convergence of broadcasting and telecommunications services. The NBTC has restructured the organisation to combine broadcasting and telecommunications together since year 2019. However, the NBTC is under the process to redesign the new business processes to fit the organisational restructure.

## **2.2 Organisational change**

The literature review of the organisational change aims to seek for the information, knowledge, and research studies of the organisational change, which I can apply for my action research study that I focus on the organisational change management area. Organisational change is defined as “the introduction of new patterns of action, belief, and attitudes among substantial segments of an organisation” (Schein, 2004, p. 320). Organisational change is a phenomenon that is not day-to-day operations, non-complementary, and non-ongoing change that influences the overall significant organisational operations of the organisation (Burke, 2008). I agree that organisational change is very important for the organisation to cope with the dynamic changing

environment; therefore, the organisation cannot treat it as the routine day-to-day operations, because the new operational conditions require the new ways of doing things, which are much different from the past. The organisational change process consists of three stages; (1) organisational change initiatives, which is the organisational change strategy formulation stage, (2) the organisational change strategy implementation stage, and (3) the organisational change performance outcomes (Weick and Quinn, 1999).

Graetz et al.(2006) describe how the change tools or models are normally both analytical and prescriptive. The analytical change model consists of the common change principles of the real root causes, mechanisms, and effects of the organisational change. On the other hand, the prescriptive change consists of a change tool to explain how the organisational change should occur. Kurt Lewin's classical change model is one of the reputable organisational change management models, which consists of three steps.

The first step is unfreezing, which is the step to open the area of complacency and self-righteousness, and this requires an emotional intervention. This step requires action to unfreeze the organisational members and influence them to open for change.

The second step is moving, which makes the change from the present to the future stage. This step involves learning new behavior to move from the unfrozen behavior to the new desirable behavior based on trial and error to make a quality decision for the best alternatives for learning.

The final step is refreezing, which is the step in which the new culture, organisational set and mechanism have been implemented, and cultural reinforcement is essential to stabilize the system to restore equilibrium.

Kotler (2011) argues that there are eight important steps for the increase of opportunity for the success of change management implementation. Therefore, it is critical for leaders transforming the organisational change to focus on these steps in the right order as in Figure 2.1.



**Figure 2.1:** Eight Steps to Successful Change (adapted from Kotler, 2011, and modified by Manaves, 2019)

The first step in Kotler's model is to establish a sense of urgency. The organisation must be alerted to consider the status quo of the organisation, and the relevant people must leave their comfort zone. The organisation normally underestimates this stage. The importance of the need for change must be perceivable and the organisation must communicate the essential information intensively and throughout the organisation.

The second step of this model is to create a strong guiding collaboration. It is very important to engage the entire organisational members to share their commitment. The change management team normally works beyond the organisational ladders to become the driving force under the changing management initiatives. The team members must have high and credible quality knowledge, expertise and leadership to lead the organisational change.

The third step is to create the vision to lead the organisational change according to the change plans. The vision must not be too complex or unclear, but it should be transparent so that the organisational members clearly understand all aspects or issues of future state of the organisation.

The fourth step is to effectively communicate this vision, as well as to initiate the organisational change strategies. All possible communication channels must be used to communicate the new vision and the organisational change strategies in order to educate and embed the new and desirable working behaviour as well as ways of thinking consistently, which is very critical for the successful organisational change.

The fifth step of this model is to engage and empower people to act on the new vision. Any obstruction or resistance to the new vision and new organisational change strategies, including systems and structures, must be got rid of immediately in order to encourage new behavior as well as new ways of working to effectively support the organisational change initiatives. The greater the success of organisational change requires the greater employees' engagement.

The sixth step is to plan for creating short-term wins. The Key Performance Indicators (KPIs) of the organisational improvement must be identified in a clear and transparent manner. The organisational change initiatives normally take a long time before they show significant results. It is, therefore, essential to set short-term goals and objectives to meet, as well as to celebrate, in order to create and nurture the motivation and confidence of the change initiatives.

The seventh step is to accumulate change improvements to increase change opportunities. The increased confidence of the successful organisation transformation should be utilized to create more change initiatives. Any obstructions or issues of the systems and structures that resist the new change vision and strategies must be changed to become supportive for the organisational change initiatives.

The eighth and last step of this model is to institutionalize the new organisational change vision and strategies in line with the organisational culture. Therefore, the organisational leaders and leaders should tie organisational changes to organisational success. The new behavior and ways of working should be embedded to become the organisation, the norm, and the shared value and culture.

In addition, Graetz, et al. (2006) argue other popular change tools that help that organisations to implement change successfully. Lean production and Total Quality Management (TQM) change the integrated supply chain operational systems with the collaborative work teams accomplish the quality control goals and objectives. Business

process re-engineering focuses on integrated business processes, sequences or agglomerations of tasks that maximize the customers' value through radical change of the business processes. High-performance work organisation (HPWO) is the change approach that focusses on the human resource management and industrial relations policies that support team work to achieve the organisational change goals and objectives. I agree that the change tools are very useful for the organisational change management to implement organisational change successfully. In addition, I believe that all change tools can be applied together to complement each other as the integrated organisational change management system to enhance the organisational change performance. For example, lean production and Total Quality Management (TQM) aim to achieve the quality goals and objectives, which can use the process re-engineering to change the business process radically to reduce scraps and apply the HPWO to enhance the human resource competence and teamwork to match the new redesign business processes.

Deszca, et al. (2020) argue that the effective organisational change implementation requires action planning tools, which can be described as the following.

1. To do list is used as a check list of the essential actions to do.
2. Responsibility charting is applied for responsible persons (who) to specific actions (what), time frame (when), reasons to do the particular actions (why), and ways to take required actions (how).
3. Contingency planning is used to identify the critical issues as well as plan for the emergency actions.
4. Flow charting is used to explain and to assess the existing processes chart as well as to propose the change of the redesign of the business processes.
5. Design thinking is used to engage all relevant stakeholders to brainstorm their creative ideas for the successful organisational change.
6. Surveys, survey feedback, and appreciative inquiry is used gain participants' ideas and keep tracking their responses, observations and insights continuously to identify what needs changing, maintaining engagement and support as well as tracking progress.

7. Project planning and critical path methods are applied to manage and monitor the change project.

8. The assessment tools of the forces affecting results and stakeholders include commitment charts to evaluate the commitment level of major players; the adoption continuum or awareness, interest, desire, adopting (AIDA) analysis to investigate major players as well as their positions on the AIDA continuum according to planned changes.

9. Leverage analysis is applied to identify the effective methods to influence major groups or players according to the planned changes.

10. Training and development tools are used to design and educate the employees to enhance their competence to improve their performance according to the planned changes.

11. Diverse change approaches are applied to select the most suitable change techniques and tools to implement change sustainably success.

I believe that the eleven tools for action planning is very useful for the effective change management and implementation. However, I think that the organisation must learn how to select the most suitable tools for their action planning, which might also have to change to match to the dynamic change environment in order to implement change successfully. Cameron and Green (2020) also argue that the change implementation is very important change process, and the changed organisation must select the most suitable change tools for them to apply during the change implementing process in order to achieve the change goals and objectives.

### **2.3 Critical Success Factors (CSFs)**

The main purpose of the literature review of the Critical Success Factors (CSFs) aims to review the CSFs concepts and the information of the CSFs of the organisational change management that can be used to develop the CSFs Taxonomy of the Organisational Change Management for this action research study.

### **Critical Success Factors (CSFs) concepts**

Rockart (1979) argues that Critical Success Factors (CSFs) are used to determine the critical information for top management to make high quality decisions to manage the business effectively and successfully. The CSFs are defined as the events or areas that must go right for the successful business performance. The business success normally focuses on the organisational goals, which represents the end results of the desirable organisational outcome. However, the CSFs consist of the important focus that a good outcome is very important in accomplishing these organisational goals. The CSFs focus on goals, which represent the outcome that the organisation is aiming to accomplish. Therefore, it is in these areas that good performance is necessary to ensure the achievement of these goals, and therefore, managers should focus on these critical areas carefully and constantly during the implementation of the concept to achieve a desirable outcome. Thus, if the CSFs exist for implementing an organisational change, the identification of these factors would be very useful for managers in influencing the outcome of the organisational change implementation efforts. I think that the organisation has limited resources to use to manage its business, which it is important to allocate the resources effectively to ensure the accomplishment of its goals and objectives. Therefore, it is very useful to identify the CSFs and allocate the organisational resources as well as pay most attention to these CSFs.

### **Critical Success Factors (CSFs) of the Organisational Change Management**

Fritzenschaft (2011) argues that most authors and researchers identify the CSFs to minimize the resistance to change. However, there is not just one that is suitable for managing and leading change. Organisational change involves the transformation to achieve the future desirable outcome, which includes a time and context that remain unknown, and there is no universal concept or theory of such organisational change. Therefore, a successful management who is leading change cannot formulate a single standardized process. The change tactics should engage the employees as early as possible, and the best change tactics should be based on planning and a methodological transformation that are best responded by the employees, as well as the key stakeholders. Leaders who lead and manage successful organisational change accept that there are different CSFs and use them to develop the most suitable framework to transform organisational change. I agree that the CSFs is very important to implement

the organisational change management effectively, because these factors highly influence the organisational change success or failure. Therefore, the organisation must identify and set priorities of the CSFs and then focuses on the highest important priority of the CSFs.

In addition, I believe that each CSF should have different level of the importance at different phases of change implementation. According to Fritzenschaft (2011) argues that various factors are most critical for organisations surveyed in the different organisational change phases. In each phase the participants were asked to evaluate the importance of each CSF on a scale from zero (not important) to four (very important). The highest ranked CSFs can be elaborated as follows.

### ***Phase I: Prepare and create readiness for change***

The first phase of a change project is “prepare and create readiness for change”, or as Lewin referred to it as “unfreezing”, and this is normally considered as the most important phase as it provides the foundation for the entire organisational change project. The lack of the serious attention to this change phase normally leads to the failure of the organisational change. This phase is very important because the biggest mistakes at the start of the change initiatives will create the highest potential for the change failure. The employees’ engagement must be ready before the start of the change transition, as a key to embed and nurture the organisational change.

The CSFs of this phase are classified into two categories. The first category consists of the factors concerned with the management level. The second category consists of the factors concerned with the aspects that impact or involves employees. The participants of the survey were interviewed to evaluate these factors from a management perspective.

Fritzenschaft (2011) summarizes the research results of CSFs of phase I as in table 2.1.

**Table 2.1** Empirical research: Critical Success Factors (CSFs) in the first phase -  
“prepare and create readiness for change.”

<b>Critical Success Factors (CSFs) at the management Level</b>	<b>Score</b>
1. To define objectives/vision	3.7
2. To analyze and understand situation/environment	3.6
3. To establish confidence	3.5
4. Support and commitment of the management	3.3
5. To set up communication strategies	3.0
<b>Critical Success Factors (CSFs) at the employee level</b>	<b>Score</b>
1. To create a shared problem awareness	3.5
2. To communicate upcoming change	3.5
3. To create a sense of urgency	3.2
4. To actively involve employees in planning	3.2
5. To consult employees' representatives	2.4
6. To provide financial and other rewards	2.2

The factors that are evaluated as the most important at the management level in the first phase is “to define objectives/vision” (3.7). The second most important factor is “analyzing and understanding situation/environment” (3.6). On the employee level, it is critical that managers “create a shared problem awareness” (3.5). The least important factors consist of “providing financial and other rewards” (2.2) as well as “consultation of employees’ representatives” (2.4). I agree that the most important factor at the management level is to define objectives and vision, because the right objectives and vision must be set right from the management level as the direction for employees at all levels to follow to achieve the change objectives. Fritzenschaft (2011) supports that the effective vision establishment is very important for the success of the change strategy. The effective vision acknowledges the relevant stakeholders to understand the reasons for the organisational change urgency as well as to be able to foresee the expected future state of the organisation. The organisational members will not be able to know how the organisation will operate without effective vision. Collins and Porras (2005), in their empirical research, supported the opinion that it is critical for the organisational to create

an effective change vision and then communicate the new vision to the internal stakeholders, and at the same time to the external stakeholders. The objectives should be measurable and align with the vision as well as the organisational strategy. The communication of clear objectives is also critical for the success of organisational change. Isern, Meaney and Wilson (2009) argue that the establishment of vision and objectives is the most critical step for the organisational change project. Unclear vision and lack of objectives are potentials for an organisational change project to fail. To analyze and understand the situation/environment is a process that should come before the set of vision and objectives. Burke (2008) argues that the organisational leaders should monitor and analyze the business environment continuously so as to gather enough essential information to analyze the future organisational change impact in order to manage the organisational change successfully.

In addition, Fritzenschaft (2011, p.39) argues that the most critical factor of the phase one at the employee level is “to create a shared problem awareness”. It is very important that employees are engaged in sharing the common understanding of the urgency of the organisational change, and this will gain the employees’ commitment before the implementation of organisational change. I agree that the employee engagement is very important to gain the highest commitment and contribution from the employees to implement the organisational change. According to Lawson and Price (2003) argue that if the organisational members understand the overall change project this will encourage the employees to be motivated and change their personal behavior and commit to the organisational change effectively. It is very important for the change leaders to communicate the organisational change process clearly in order to convey the correct message through the right communication channels at the right time, in order to manage organisational change successfully. Any incorrect communication of messages may cause an organisational change failure, so the organisational change leaders must be very careful to plan and implement the change communication strategy effectively. Garvin and Roberto (2011) commend that it is very critical to balance the optimism and realism of the organisational change message and to communicate carefully. The change message should be clear, precise, and realistic so as to enable all relevant stakeholders to understand correctly in order to support a successful organisational change.

### ***Phase II: Execute change***

The second phase of a change project is “Execute Change”, which is very important in implementing the organisational change successfully.

The research results of the CSFs of phase II, and the results shows in table 2.

**Table 2.2** Empirical research: Critical Success Factors (CSFs) in the second phase “Execute Change”

<b>Critical Success Factors (CSFs)</b>	<b>Score</b>
1. Competence and commitment	3.7
2. Employee engagement	3.4
3. Resource allocation	3.3
4. Systematic project management	3.3
5. Communication of change and progress	3.3
6. Top management support and commitment	3.1
7. Progress monitoring and making adjustments	3.0
8. Setting intermediate objectives/milestones	2.8
9. Quick win management and planning	2.8
10. Provision of training and workshops	2.8
11. Innovative reward system	2.0
12. Change of champions and professionals	1.6

The factor is considered as the most important at the management level in the first phase is “to determine competences and commitments” (3.7). The second most important factor is “to actively involve employees in executing the change” (3.4), “to provide resources (time, money, people)” (3.3), and “to use a systematic approach/project management” (3.3). I agree that the competences and commitments are essential to implement change successfully, because the change execution also needs the employees who have enough competences to commit to put hard efforts to take actions during this change phase.

In addition, Morgan and Zeffane (2003) argue that employees who are not engaged and are not able to contribute to the organisational change, and who do not trust the top management critically, in which case the organisational change project has a high chance of failure; in contrast, employee engagement at the earlier stage will have higher a chance of success. Fritzenschaft (2011) argue that the resource allocation factor is considered as the third most critical factor at the second phase, as sufficient financial, human resources, and time resources increase the flexibility of quality decision-making in implementing the organisational change project successfully. Stankovik, et al. (2013) argue that the successful organisational change management requires the necessary resource allocation including financial, human resources, and other relevant resources to ensure the change is implemented smoothly.

### ***Phase III: Consolidate change***

The third and last phase of a change project is “Consolidate Change”, which is referred as “refreezing the status quo” according to Lewin.

The results of the CSFs of this phase are shown in table 2.3.

**Table 2.3** Empirical research: Critical Success Factors (CSFs) in the third phase “Consolidate Change”

<b>Critical Success Factors (CSFs)</b>	<b>Score</b>
1. Communication of change and progress	3.4
2. Progress monitoring and the making of adjustments	3.3
3. Support and commitment of the management	3.2
4. Time to consolidate change	3.2
5. Innovative reward system	2.1

The factors that are evaluated as the most important at the management level in the first phase are “to communicate change and progress” (3.4). Fritzenschaft (2011) argues that it is essential to communicate the change and progress continuously in order to shape the new ways of working and thinking for the employees, and then to nurture the organisational change standards for a long-term change success. I agree that it is

essential to communicate change progress during the change execution in order to provide update change progress to all relevant stakeholders to gain their confidence as well as their commitment. Gerhardt and Fisher (2008) also shows similar empirical results, stating that the effective communication of the change progress continuously enhances the organisational change project more effectively. The second most important factor is “progress monitoring and making adjustments” (3.3), by which the organisational change leaders are able to respond to the potential problems or issues of the organisational change management quickly, if they monitor the organisational change progress continuously to ensure a successful organisational change Gerhardt and Fisher (2008) commend that organisational change progress monitoring and adjustment is very important, so that the change leaders may compare the change results with the actual change performance, and then fine tune the change program to be able to accomplish the organisational change objectives. The third most critical factor is “support and commitment of management” (3.2) because the top management have the authority to allocation the critical resources to implement successful organisational change management. Stankovik, et al. (2013) argue that top management support for and commitment to organisational change are very important for the organisational change project, in leading as well as providing the essential resources that are required to implement change and to achieve the change vision and objectives. However, the results also showed that the factor of “innovative reward system” is evaluated as an unimportant factor, the same as in the first and the second phase of the change.

In addition, the research of the CSFs of the organisational change also evaluated the overall ranking of the CSFs, which can be summarized as in table 2.4.

**Table 2.4** Empirical research: overall ranking of Critical Success Factors (CSFs)

<b>Critical Success Factors (CSFs)</b>	<b>Score</b>
1. Define objectives/Vision	3.7
2. Competences and commitment	3.7
3. Understanding environmental analysis	3.6
4. Establish confidence	3.5
5. Create a shared problem awareness	3.5
6. Communicate results and progress	3.4
7. Employee engagement	3.3
8. Resource allocation (time, money, people)	3.3
9. Systematic project management	3.3
10. Create a sense of urgency	3.2
11. Top management support and commitment	3.2
12. Time to consolidate change	3.2
13. Monitoring and the making of adjustments	3.2
14. Set up objectives and milestones	3.0
15. Set up the communication strategy	3.0
16. Quick win management and planning	2.8
17. Provide training and workshops	2.8
18. Consult employee representatives	2.4
19. Innovative reward system	2.1
20. Change champion and professional	1.6

Table 4 shows that the top three most important Critical Success Factors (CSFs) of the overall ranking were “to define objectives/vision” (3.7), “competence and commitment” (3.7), and “understanding environmental analysis” (3.6) respectively. The three least important Critical Success Factors (CSFs) were “change champion and professional” (1.6), “innovative reward system” (2.1), and “consult employee representatives” (2.4) respectively.

There is more literature that conducted studies of the CSFs of Organisational Change which can be elaborated as follows.

Gerkhardt, Frey and Fisher (2008) provide a change model to identify the 12 CSFs, which can be used for a change project to be handled through working along with the 12 CSFs of organisational change as follows.

#### 1. Shared problem awareness

Problem awareness is very important for a successful organisational change process execution. It is very critical to encourage the employees to participate and to have a clear sense of urgency and they will then be open to innovation and organisational change. Farhan, et al. (2018) agree that employee engagement is a very important factor for the success of organisational change management, because it motivates the employees to share their innovative ideas and concerns and contribute effectively to the organisational change project.

#### 2. Comprehensive diagnosis

The organisational change project should have a comprehensive diagnosis from the start of the change project to assess the current status to identify the threats and opportunities. The realistic analysis enables the relevant stakeholders to become involved in identifying the needs of change. Farhan, et al. (2018) agree that the operations management support factor is essential for analysing the change process situation in order to solve any change problems or seek for change opportunities.

#### 3. Management coalition

Top management is very important in driving and supporting the organisational change process to gain the confidence of the lower management team as well, as other employees, in order to gain their full contributions for a successful organisational change project. Chow and Cao (2008) consider that strong executive support is the critical success factor of an organisational change project, as they have direct power to lead as well as to allocate the essential resources for the change project.

#### 4. Defining the vision and objectives

A defined vision and objectives of the organisational change is very important for communication to the relevant stakeholders clearly, in order for them to understand the change journey, and this will motivate them to support the organisational change project significantly. Fritzenschaft (2011) commends that an effective vision establishment is very

important for the success of the change strategy. An effective vision acknowledges the relevant stakeholders to understand the reasons of the organisational change urgency as well as to be able to foresee the expected future state of the organisation. The organisational members will not be able to know how the organisation will operate without effective vision. In addition, the objectives should be measurable and aligned with the vision as well as the organisational strategy.

#### 5. Project organisation and responsibilities

The change project team should be well-organized, trustworthy and creditable so as to encourage the full participation and contributions to achieve the vision and objectives. Chow and Cao (2008) agree that change project team members with the required competence and expertise are very important for the success of a change project because the change process must provide capable team members to run the project smoothly.

#### 6. Time management

The time management factor is very critical in implementing the organisational change project successfully. The organisational change project should be planned systematically with a probable time schedule. Time management will enable the change project leaders to have enough time to implement the change process as well as to communicate with the relevant people to coordinate and handle the change activities more effectively. Farhan, et al. (2018) commend that time management is a critical success factor of the change project implementation

#### 7. Helping people to help themselves, training, and resources

Essential resources including human resources, time, and budget should be provided to implement the change process. The human resources must be provided with the necessary training to improve their capability to contribute to the change project successfully. Farhan, et al. (2018) agree that competent human resources with proper training is very important in managing the change project successfully.

## 8. Communication

Regular and interactive communication is very important for the change process. Prior positive communication in good time enables the prevention of potential rumours and negative impact, however, clear communication of bad news helps the change process to be confident in implementing the change project successfully. Chow and Cao (2008) agree that the strong communication focus with a daily face-to-face is a critical factor for change leaders and for both internal organisational members and external stakeholders, so as to implement the change project effectively.

## 9. Monitoring

Change process monitoring is very critical so that the change leaders may measure the change performance continuously, and the potential problems or issues can be solved immediately if the real performance deviates from the vision or objectives. Fritzenschaft (2011) agree that monitoring the change process is essential for the organisational change leaders in being able to respond quickly to the potential problems or issues of the organisational change management. They should therefore monitor the organisational change progress continuously to ensure a successful organisational change project.

## 10. Initial success and motivation

The quick win of the initial change success enhances the change team motivation, which helps energize them to confirm the successful change strategy and then move the change process forward more confidently. Chow and Cao (2008) commend that the team members with great motivation enhances the success of the change project implementation.

## 11. Flexibility in the process

The change projects should be flexible in order to cope with the dynamically changing environment, which might impact the organisation differently from the initial change vision and objectives. Chow and Cao (2008) agree that an agile flexible change process is necessary for the change process implementation to adjust to fit the dynamically changing environment.

## 12. Commenting the change

A successful change project can be maintained through written rules, work procedures, and behavioural guidelines, which all are very important for sustainable change management. Chow and Cao (2008) commend that the new organisational change process can be stored through the new process standards, rules, and standard operating procedures.

Stankovik, et al. (2013) argue that CSFs for implementing the organisational change to adopt agile software projects in the organisation can be classified into five categories 1) organisational factors, 2) people factors, 3) process factors, 4) technical factors, and 5) project factors, which can be summarized as in table 2.5.

**Table 2.5** Critical Success Factors (CSFs) of the Organisational Change in implementing the agile IT projects in the organisations

Dimensions of the Critical Success Factors (CSFs)	Critical Success Factors (CSFs)
1. Organisational Factors	1.1 Strong executive support 1.2 Committed sponsor or manager 1.3 Cooperative organisational culture 1.4 Organisational acceptance of new technology 1.5 Effective collective teamwork 1.6 Support for agile working environment 1.7 Effective reward systems
2. People Factors	2.1 Competence and expertise of team members 2.2 Great people motivation 2.3 Knowledgeable management team 2.4 Effective management style 2.5 Effective self-managing team 2.6 Excellent customer relationship
3. Process factors	3.1 Compliance with the required management 3.2 Compliance with the project management process 3.3 Compliance with the configuration management process 3.4 Strong communication of the process progress 3.5 Strong customer commitment
4. Technical factors	4.1 Well-designed simple technical standards 4.2 Following the technical design standards 4.3 Right amount of documentation 4.4 Technical training for team members
5. Project factors	5.1 Project type and nature 5.2 Project scope and schedule 5.3 Project team

Farhan, et al. (2018) argue that the CSFs of the organisational change in implementing the Customer Relationship Management (CRM) is very important in identifying and prioritizing the importance in order to achieve the desirable benefits of the CRM initiatives, which can win the long-term customer relationship, as well as the organisational competitive advantage. The CSFs can be classified in four categories 1) organisational factors, 2) technological factors, 3) process factors, and 4) project factors, which can be summarized as in table 2.6. Stankovik, et al. (2013) agree that there are similar CSFs of the organisational change as Farhan, et al. (2018) and include organisational factors, process factors, technology factors and project factors. However, Stankovik, et al. (2013) argue that people factors are also CSFs, but Farhan (2018) does not specify as the CSFs of the organisational change management.

I think that all relevant literature review shows the same direction that the CSFs are very important for the organisational change management. Moreover, the ranked CSFs of the Organisational Change Management of each literature shows the same direction. Therefore, the results from the relevant literature review are used as secondary data of the CSFs for my action research.

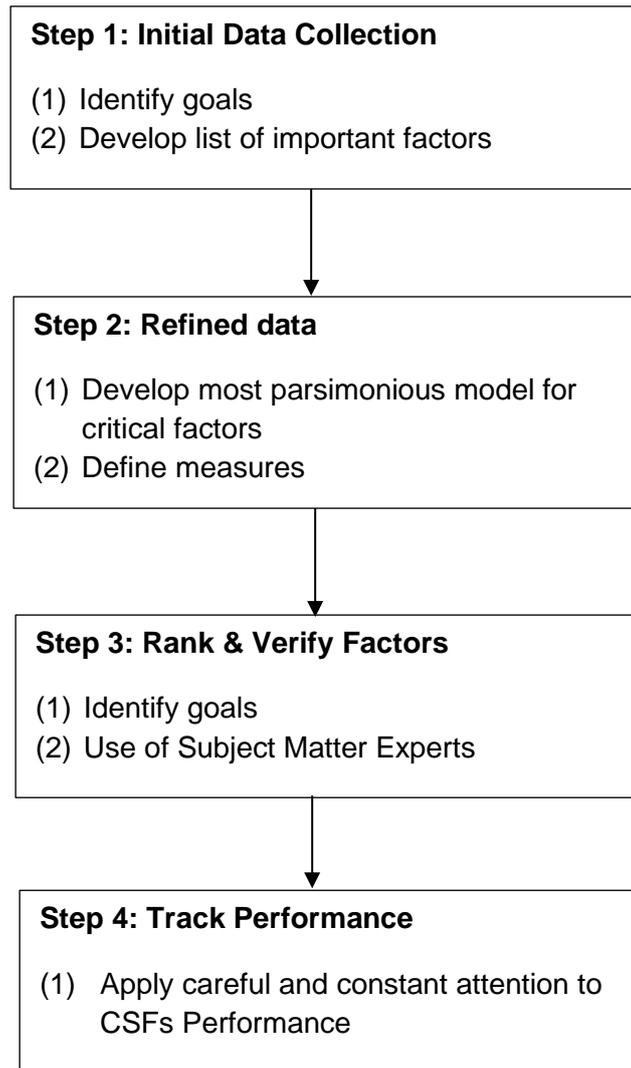
**Table 2.6** The classification of the Critical Success Factors (CSFs) of CRM organisational change

<b>Critical Success Factors (CSFs)</b>	<b>Organisational factors</b>	<b>Technological factors</b>	<b>Process factors</b>	<b>Project factors</b>
1. Top management support	√			√
2. Information technology		√		
3. Skillful and trained staffs	√			√
4. Organisational culture	√	√	√	
5. Customer information management	√		√	
6. CRM strategy	√		√	
7. Employee engagement	√	√	√	√
8. Monitoring, controlling, and correction			√	
9. Knowledge management (KM)	√	√		
10. Well defined goals and objectives	√			
11. Organisational structure	√			
12. CRM software selection	√	√		
13. Interorganisational integration	√		√	
14. Customer contact management	√	√		
15. Services automation	√	√	√	
16. Sales automation	√	√	√	
17. Customers/consultant involvement	√	√	√	
18. Process change	√			√
19. Customer satisfaction	√			
20. Marketing automation		√	√	
21. Time and budget management			√	√
22. Software customization		√		
23. Change management	√			√
24. CRM champion	√			√
25. Shared data willingness		√	√	
26. Customer segmentation	√		√	
27. Size of organisation	√			
28. Operations management support	√	√	√	
29. Procedures and policy	√			√
30. Creation of multidisciplinary team			√	√

## **2.4 The Critical Success Factors (CSFs) methodology**

The literature review of the Critical Success Factors (CSFs) methodology aims to review the information of this CSFs methodology that can be used as the research methodology to develop the Critical Success Factors (CSFs) of the Organisational Change Management of the NBTC.

Rockart (1979) develops the Critical Success Factors Methodology to identify the Critical Success Factors (CSFs). The iterative process of the Critical Success Factor Methodology starts with the compilation of all factors that are identified as important factors for the organisational success. The compilation of the important factors consists of an in-depth interview of specific experts through questionnaires, literature review, etc. In the second stage, the information is classified into systematic data by rewriting, consolidating, and entrenchment. In the third stage, the experts are interviewed to identify their CSFs from the list of the potential CSFs, and to rank them from the most important to the least important. The fourth stage is to verify the chosen factors through the experts' interview to seek their opinions, and these are usually experts from both internal and external organisations. The chosen factors and corresponding measures are analyzed and scrutinized to ensure the most results. The final stage is for the executives to apply careful and constant attention to the identified CSFs and to monitor progress during the implementation. The process is articulated and summarized in Figure 2.2.



**Figure 2.2** Steps in Rockart's Critical Success Factor Methodology

I think that the steps in Rockart's Critical Success Factor Methodology is very systematic and useful to conduct the action research to seek for the CSFs of the organisational change management as well as other relevant management objectives, which need to identify and prioritize the CSFs.

## 2.5 Business Process Management (BPM)

The literature of the Business Process Management (BPM) has the intention to seek for the relevant literature of BPM as well as the redesign of the business processes,

which I can apply to redesign the business processes of the Business Process Management of the new combined licensing bureau of the NBTC.

Heizer and Render (2017) argue that process strategy is an organisational operation to make goods and services via the utilization of resources. The process must enable the organisations to create products or services that match the customers' needs as well as product standards under the cost, time, and other organisational limitations. The process strategies consist of four approaches, and these are (1) process focus, (2) repetitive focus, (3) product focus, and (4) mass customisation. I agree that the business or operational processes must be designed to fit the products or services that the organisations produce to maximize the customers' satisfaction as well as to deliver high quality of products and services at competitive cost. In addition, Fahad (2016) argues that the business process is defined as a process of the ordering of activities with a beginning and an end, that consists of inputs and includes resources, materials, and information and a particular output of the results. Business Process Management (BPM) is focused on the set of activities performed by the organisations in managing to enhance their capability to advance to significantly improve their business processes. The BPM for the organisational change consists of six elements, which are (1) need for change in business process, (2) measure of potential over business process, (3) analysis of side effects over business process, (4) formalize and implement change, (5) monitor business process performance, and (6) retain change in business.

Heizer and Render (2017) argue that organisation often that the existing process criterion do not fit to current environment such as dynamic changing market, customer desires, new technology, and product mix change. Therefore, the existing processes must be redesigned. Process redesign is the fundamental rethinking of businesses to achieve continuous performance improvement includes cost, time, productivity, and customer value throughout the organisation. The process redesign that aims to accomplish radical change of the business processes, which is typically more than 30 percent of the process improvement is so called process re-engineering. Szlagowski (2019) argues that the development of the concept of BPM consists of 4 waves of the process management evaluation include (1) the 1<sup>st</sup> wave is industrial engineering (1911-1980), (2) the 2<sup>nd</sup> wave is value chain management (1985-2003), (3) the 3<sup>rd</sup> wave is evolutionary adaptation to the needs of the clients (2003-2017), and (4) the 4<sup>th</sup> wave is Business Process Management (BPM) and Knowledge Management (KM) (2017). In addition, Szlagowski

(2019) argues that Business Process Reengineering is used for the radical redesign of the organisation and its processes with the aim of sharp rise efficiency as well as a rise in profit by 50, 100 percent, or more. I think that the BPM can be used both normal business process and re-engineering process, but the differences are the amount of the level of the process redesign works.

Dumas, et, al. (2017) argue that Business Process Management (BPM) is considered as the management philosophy of the art and science in handling the work operational performance to make sure that it delivers continuously desirable results, and at the same time seeking the overall improvement opportunities. The improvement opportunities consist of various outcomes, including cost reduction, cycle time reduction, and failure rate reduction. The competitive advantage enhancement is also considered as one of the most important improvement opportunities of the BPM through innovation. The BPM is not considered only as an improvement of the individual activity performed, but is considered the overall integrated activities, events, and decisions that add value to the organisations as well as the customers. The overall integrated activities, events, and decisions are the so called “process”. Therefore, the BPM is very critical for the organisational change to bring a more competitive advantage. The BPM life cycle is considered as a continuous cycle, which can be classified into seven phases as shown in figure 2.3 and can be explained as follows.

**Phase 1:** Process identification is a BPM phase that specifies the business problem first, and then identifies, delimits, and interrelates the processes related to the business problem. The new updated process architecture is the output of the process identification and enables the organisations to see the whole scope of the processes in the organisation and their relationship.

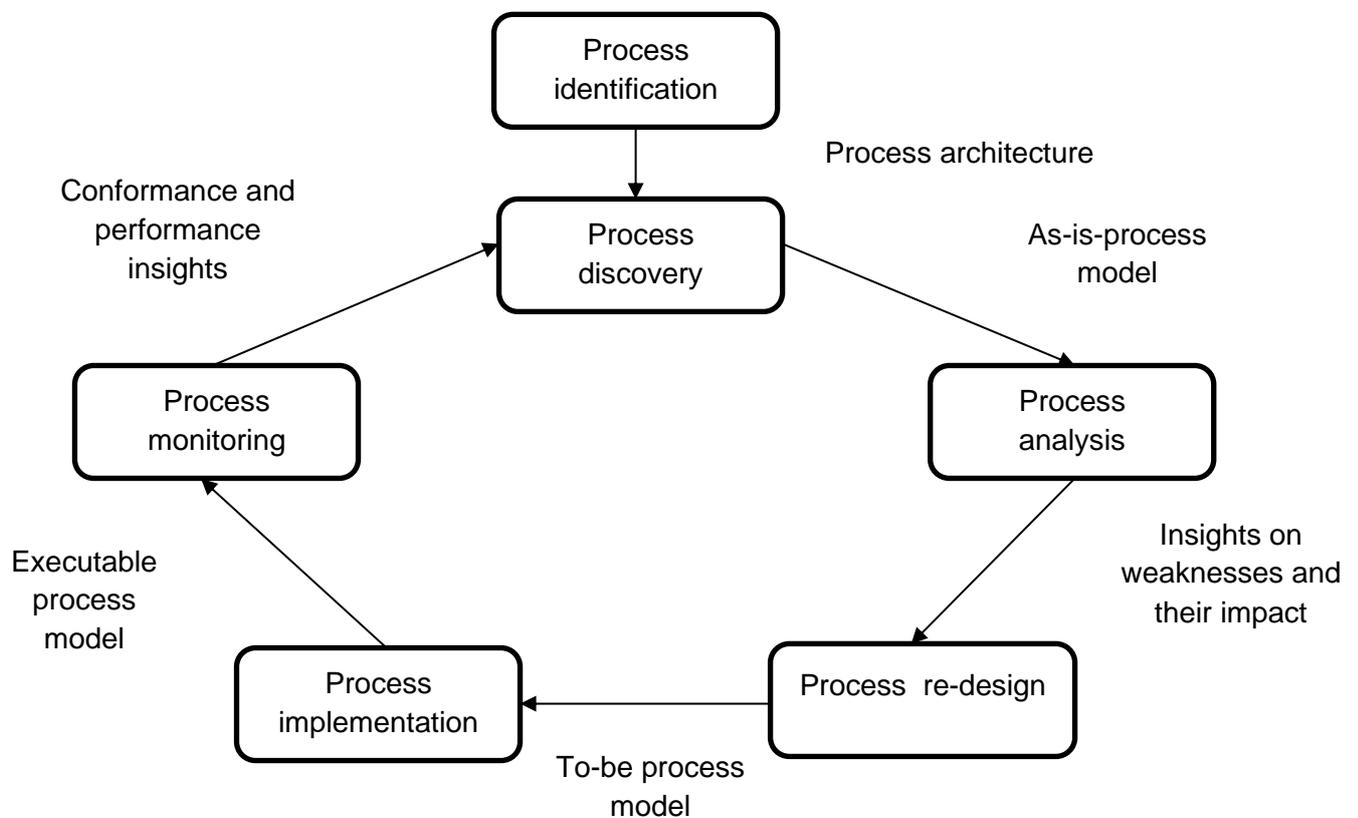
**Phase 2:** Process discovery is a BPM phase to document the relevant processes of the current stage generally in the as-is-process models, which can be either single or multiple forms.

**Phase 3:** Process analysis is the BPM phase to analyze the issues or problems which are identified from the as-is-processes, in which the process identification is documented with the quantified performance measures.

**Phase 4:** Process redesign is the BPM phase to the process improvement phase, which identifies the changes that are essential for the organisation to resolve the business problems or issues and enables the organisational objectives to be accomplished.

**Phase 5:** Process implementation is the BPM phase for implementing the business process changes, which consist of two components, namely organisational change management, and process automation.

**Phase 6:** Process monitoring is the BPM to monitor the process performance through the relevant data collection and analysis, in order to determine the real process performance compared with the desirable performance objectives, using the performance measurement systems.



**Figure 2.3** The Business Process Management (BPM) lifecycle (adapted from Fahad, 2016 and modified by Manaves, 2019)

I think that the Business Process Management (BPM) that shows in figure 2.3 is appropriate to apply for the research method in chapter 3 because its six phases can cover all business processes which I can use it to analyze the existing business processes of the new combined licensing bureau of the NBTC to be redesigned for the Business Process Management (BPM).

There are a number of stakeholders involve in the BPM for the entire lifecycle. These stakeholders have different roles in the BPM lifecycle, and include managers of different rank of the organisation, business analysts, IT, and system analysts, who will initiate the role of the interdisciplinary process activities throughout the business process. The roles of the stakeholders can be elaborated as management team, process owners, process participants, process analysts, process methodologists, system engineers, and BPM group, who must all work collaboratively for the success of the BPM.

Karle and Teichenthaler (2014) argue that many business changes in the telecommunication industry have been encouraged through mergers and acquisitions, and the dynamic changes within of this industry forced telecommunication organisations to adjust or enhance their business processes to improve productivity, speed, quality, efficiency and effectiveness. "3" is the leading global mobile telecommunication brand of CK Hutchison Holdings, whose business headquarters are located in Hong Kong. The company has faced disruptive technology impacts as well as a merger; therefore, it had to develop the redesign of the business process to fit the new dynamic change of the environment. The company has applied the collaborative BPM across the organisation by the participation of all relevant parties to become involved in sharing their knowledge and experience for the new business process design and implementation. The collaborative BPM requires the training of a new business process to design, implement and test this process intensively to ensure that the change was successful. The BPM results of this project showed that a successful BPM implementation includes (1) right mixtures of the field operations, (2) interconnection of the various business model types, (3) a creation of a learning environment to develop and nurture the effective Knowledge Management (KM) and (4) that strategic control is essential for business transformation.

For many organisations, the BPM is one of the most critical and is of strategic importance. Therefore, top management are greatly concerned and give their full effort for the BPM, to ensure that it can run smoothly for all of the phases of implementation. The successful BPM can bring great benefit to the organisation, including a clearer understanding of the business processes, more focus on the most important process problems or opportunities, and higher business performance.

The typical stages of the Business Process Management (BPM) in five stages are shown in figure 2.4.



**Figure 2.4** Typical stages of Business Process Management (BPM) adoption (adapted from Fahad, 2016 and modified by Manaves, 2019)

From figure 2.4, the BPM comprises five stages, which can describe as follows.

**Stage 1:** The awareness and understanding of BPM is very critical for the organisations to recognize the value of BPM and to be confident on the contribution of benefits that the BPM can provide. Intensive training and education are essential for organisational members to have awareness and understanding of BPM.

**Stage 2:** The business driver, which is a sense of urgency and individual motivation of BPM (a champion) are very important as the second stage of BPM adoption. The business drivers and champions must be considered as critical enough to influence the top management and key employees within the organisations to be convinced to accept BPM. The business drivers include cost reduction, customer satisfaction enhancement, organisational responsiveness, quality management systems, organisational change strategy, and legislation compliance management.

**Stage 3:** The setting up, implementing, and monitoring of individual BPM projects are essential to build up BPM capabilities and credibility within the organisation. The BPM projects might consist of process modelling and enhancement of the specific process as well as education and training of the BPM.

**Stage 4:** The successful projects can be moved on to be a BPM program, for which the entire BPM methodology must be designed and must align with the BPM roadmap for the implementation.

**Stage 5:** The BPM Center of Excellence (CoE) is central for the entire organisation and should be run by a chief process officer (CPO). The job of the CPO is to make sure that all BPM activities are consistent with the effectiveness and the efficiency of the relevant BPM service activities, include defining and modeling current business processes, analyzing and optimizing the processes, training and educating employees to motivate the individual process initiatives, process performance measurement, and assigning process ownership.

Berman (2014) argues that the BPM project must identify the activity of the process improvement includes (1) define the scope and objectives of the project, (2) create project schedule, and (3) complete the project schedule. I think that sometimes the project activities might delay from the schedule; therefore, the BPM implementing team must prepare the contingency plans to speed up the delayed activities back the planned project schedule.

Panagacos (2012) argues that the organisation can gain the benefits of the BPM to be able to provide more services and products with less effort, higher quality and lower cost. A study by Garner in 2008 shows that the organisations that implemented BPM, 75 percent of them achieved 15 percent or higher return on investment than those that did not implement the BPM. Besides, the financial benefits, the organisations that implement BPM can gain the benefits of error reduction, enhancing customer satisfaction, and increasing the business process transparency.

Buh, et al. (2015) argue that the Critical Success Factors (CSFs) of Business Process Management (BPM) adoption are very important and should be clearly identified as BPM adoption can be initiated by various goals and objectives; therefore, the definition of BPM success is identified by the goals and objectives as the BPM adoption is accomplished. The BPM maturity models are normally used to measure the success of BPM adoption. The BPM maturity model provides the BPM development in the organisations, which will help to identify the CSFs of the BPM adoption.

In addition, Buh, et al. (2015) review the relevant literature of the CSFs of the BPM adoption, this can be summarized as in table 2.7.

**Table 2.7** Critical Success Factors (CSFs) of the Business Process Management (BPM) adoption (adapted from Buh, et al., 2015, and modified by Manaves ,2019)

Item	Critical Success Factors (CSFs) of BPM Adoption
1.	Top management support/management participation
2.	Strategic alignment of corporate goals and objectives with BPM
3.	People factors: competence/motivation/commitment/empowerment/engagement
4.	BPM methodology
5.	Effective communication
6.	Technology factors: information technology/IT investment and support
7.	Culture: corporate culture/culture of change/collaborative culture
8.	Project management
9.	Change management
10.	Performance measurement
11.	Governance
12.	Knowledge management (KM) of BPM concepts, theory, and processes
13.	Continuous improvement/continuous optimization
14.	Clear process owners' identification

Buh, et al. (2015) argue that top management support is considered the most important factor for the successful BPM adoption because it is essential to initiate as well as to allocate the necessary resources to support adoption of BPM. The BPM project must clearly define goals, objectives, and action plans in alignment with the organisational strategy. The organisation must focus on the real benefits of the business processes and communicate effectively to the all key stakeholders, particularly to the participants, in order to motivate, empower and cooperate with them to put hard effort into contributing to the accomplishment of the expected outcomes. The employees who participate in the BPM must be trained to develop and enhance their required knowledge and skills. People in the organisation must be communicated with effectively so that they may clearly understand the goals, objectives, roles, responsibilities of the BPM, as well as being informed of the progress throughout the process duration. A sense of urgency of the people in the organisation is crucial, as these people must be ready and willing to change. The organisational culture has played a crucial role in the success of the BPM adoption, and it must be compatible with embedded culture of the BPM in order that the BPM may

be successfully adopted. I agree that the leaders must understand the BPM concept clearly and transform their ways of thinking from a traditional functional style to a new business process model and share it with the people throughout the organisation in order to adopt the new business process model successfully. The CSFs of the BPM adoption must be considered as a linkage rather than individual concepts. Moreover, the CSFs of the BPM adoption are different during the different stages of the BPM adoption; therefore, the taxonomy of the CSFs of the BPM adoption is very important and the organisation should focus on the most important factors.

## **2.6 Performance measurement**

The main focus of the performance measurement aims to explore the knowledge of the performance measurement concepts as well as relevant research studies to apply for the framework to use to measure the business process performance of the Business Process Management (BPM) through the Key Performance Indicators (KPIs) Taxonomy that is developed for the action research (AR) study.

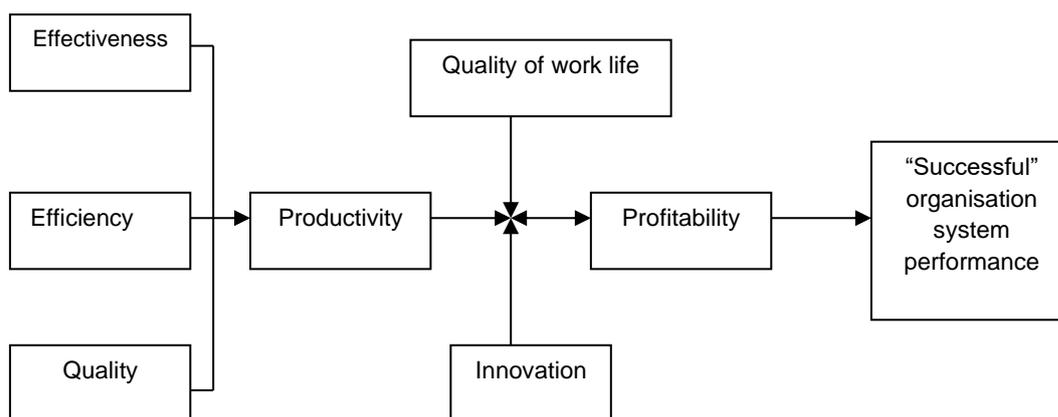
The performance measurement concept has been developed from lessons learned through trial and error for the past century. The industrial revolution leads to the introduction of productivity and productivity measurement as a result of the rapidly changing technological development. However, the term of productivity is the same as efficiency, labor productivity, and machine utilization (Anderson & Fagerhaug, 1999).

In addition, I think that performance measurement is a process that involves determining what to measure, identifying data- and collection methods, and collecting the data. It provides information that enables organisations to understand their processes, know their weaknesses or the problems that should be corrected and their strengths that should be enhanced, and to use this data to make intelligent decisions. Also, it provides feedback to show the results of the improvements, decisions, and operations and whether these meet the targets or customer requirements. According to Kaydos (1991) argues that the organisations should measure their performance at the organisational level to support the accomplishment of their vision, mission, goals, and objectives. It is typical that organisations are divided into individual units, which constitute the organisational resources; it is, therefore, necessary for the organisations to ensure that each individual

unit spends the limited organisational resources effectively. Performance measurement of the individual unit can be applied to monitor the individual employees, work groups and departments and take corrective action in order to accomplish the desirable organisational goals and objectives.

Sink (1985) describes how the performance measurement is considered as part of the management process. The organisational top management can make better decisions for “what is managed,” that is the organisational system. Performance measurement helps what is managed through collecting the essential specific performance information to be analyzed and deliver it to the top management for higher quality decisions that cover the overall internal and external environment in order to reflect the organisational goals and objectives. I agree that the management process should include performance measurement because to measure the organisational success requires the proper performance system to assess the actual outcomes compared with the desirable results. If the actual organisational performance is deviated from the target, and the management can take essential corrective actions to put the performance back on track.

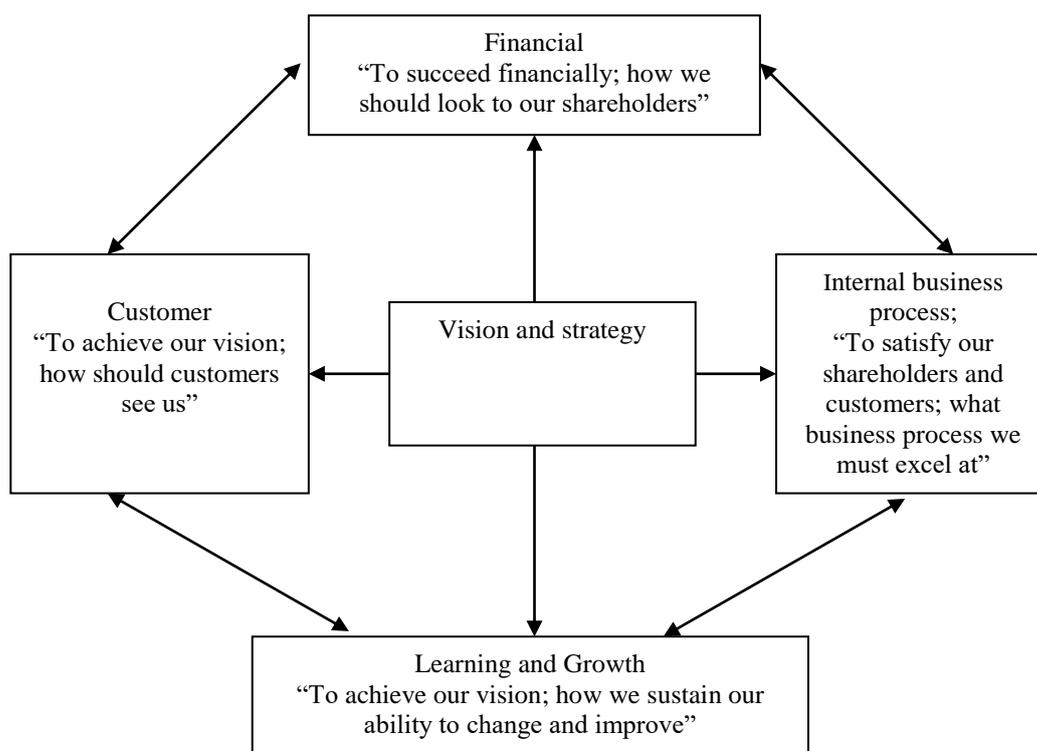
Nahmias (1997) suggests that the management process consists of four components: planning, organizing, leading, and controlling. Sink and Tuttle (1985) argue that performance measurement consists of seven performance criteria figure 2.5.



**Figure 2.5** Hypothesis of the cause and effect relationships among organisational performance criteria

Source: Sink (1985)

Kaplan and Norton (1992) suggest the Balanced Scorecard (BSC) as a performance measurement system that helps top management the management concept to transform the organisational strategic objectives to the performance measurement system with four different perspectives: namely financial, customer, internal process, and innovation and learning perspectives. The internal business process perspective of the Balance Scorecard (BSC) can be measured the key performance of the business processes of the Business Process Management (BPM) through the Key Performance Indicators (KPIs) Taxonomy. The Balance Scorecard is shown in figure 2.6.



**Figure 2.6** Four perspectives of organisational performance

Source: Kaplan and Norton (1992)

Arnaboldi, et al. (2015) argue that performance measurement and management in the public sector are very challenging for government organisations to implement and ensure the quality of their public services. The public sector is considered as an area of inherent complexity. This includes bureaucratic culture, a high rate of political intervention, and non-integrated functions. Therefore, the complex nature of the public

sector creates a difficulty for the delivery of a high and equal quality of services for the social needs. The key pitfalls of the performance management systems in public service organisations consists of the negative impact of the organisational performance and the poor human capital management in the critical areas of self-discipline, ethics, morale, motivation and behavior. The ineffective performance management systems can cause government employees to show negative mental and organisational effects, these include a high degree of stress, low motivation, low morale, low job satisfaction, distrust, and fear, and all of these lower the quality of public services. Therefore, the effective performance management systems of government organisations are very important and appropriate for the public society, in order to enhance the quality of the public services as well as the quality of life of government employees. In addition, performance measurement enables government organisations to rationalize their public service operations and enhance the productivity of the BPM, which can utilize the government budget with greater efficiency. I agree that the governmental organisations might lack of motivation to excel their working performance because of bureaucratic culture, a high rate of political intervention, and non-integrated functions; therefore, it is critical to implement the performance measurement and management system in place in order to ensure the high working performance can be accomplished.

## **2.7 Key Performance Indicators (KPIs)**

The literature review of the Key Performance Indicators (KPIs) aims to review the concept of the Key Performance Indicators (KPIs) as well as the research study of the KPIs of the Business Process Management (BPM), which can be applied to develop the Key Performance Indicators (KPIs) of the Business Process Management (BPM).

Binci (2020) argues that organisations today are facing a dynamically changing disruptive technology, which forces them to implement organisational change projects and accomplish their vision and objectives through the Business Process Management (BPM). The organisational change project requires the BPM to redesign the integrated business processes of the entire organisation in order to achieve the desired performance. Key Performance indicators (KPIs) are a management tool to measure the business process performance according to the organisational change vision and

objectives, and it is critical for the organisational change team to keep monitoring, evaluating, and taking corrective actions of the real performance if it deviates from the expected KPIs targets. I agree that the KPIs is very useful as a management tool and I have used it at my organisation to set the performance objectives and targets for both organisational level and individual level, which I can use it to manage my organisational performance effectively. Eladio, et al. (2019) suggest that organisations need to assess and evaluate their process activities so as to ensure that their vision, goals, and objectives have been accomplished. The guarantee of the desirable achievement is to evaluate the organisational performance through a performance measurement, which normally uses the metrics as KPIs. The KPIs are a set of performance metrics, which are very critical for the organisational change project to turn its change vision, goals, and objectives into reality. I agree that the organisational process activities must align with the organisational vision, goals and objectives, because the achievement of the process performance must bring the accomplishment to the organisational performance targets.

Ammons (1996) considers that there are several types of performance indicator that are often used in performance measurement systems. The most important types of measure include input indicators, output/workload indicators, outcome/effectiveness indicators, efficiency and cost-effectiveness indicators, and productivity indicators. The productivity indicators consist of a combination of efficiency and effectiveness as a single indicator. For example, one may combine the dimensions of efficiency and effectiveness in a single indicator. A further example is that whereas “meters repaired per labor hour” reflects efficiency, and “percentage of meters repaired properly” reflects effectiveness, “unit costs (or labor-hours) per effective meter repair” reflects productivity. The costs (or labor-hours) of faulty meter repairs as well as the costs of effective repairs are included in the numerator of such a calculation, but only good repairs are counted in the denominator, thereby encouraging efficiency *and* effectiveness of and by meter repair personnel. In addition, Ljungholm (2015) argues that KPIs consist of the overall value chain, from inputs to outputs of the results. Social needs require a high-quality performance from the workforce throughout the whole service process. Accuracy and precision of the performance information is very important for a government organisational performance measurement and management systems. Performance information is very useful for government organisations to monitor the public services to ensure that the public service goals and objectives are accomplished within the schedule,

and a high-quality public service must be delivered at the same time to maximize social satisfaction. The KPIs provide a guidance on the working procedure consideration to deliver the desirable outcomes for public organisations, which is considered as a causal relationship between the causes and effects of the organisational input and output. A government organisations can gain benefits from the public communication of their organisational goals, objectives, and strategies through the key performance results of the KPIs, and their performance targets and build up and nurture a mutual understanding and public relationship with society. I agree that the KPIs setting should consider cause and effect of the specific performance, moreover, I agree that the KPIs system must consider the overall KPIs of the organisation at all levels in order to achieve the effective performance measurement and management integration and alignment across the organisation.

Kaplan and Norton (1996) propose the Balance Scorecard with four perspectives as a performance measurement system that provides the executives with a comprehensive framework to translate a company's strategic objectives into a coherent set of performance measures. It complements traditional financial indicators with measures of performance for customers, internal processes, and innovation and improvement activities. and these are elaborated in table 2.8. The Key Performance Indicators (KPIs) of the business process perspective can be used to develop the Key Performance Indicators (KPIs) of the Business Process Management (BPM).

**Table 2.8** Key Performance Indicators (KPIs) under the concept of the Balance Scorecard (BSC)

<b>Perspectives</b>	<b>Key Performance Indicators (KPIs)</b>
<b>Financial perspective</b>	FP1 Net License Revenue per Employee (\$) FP2 Total asset per employees (No.) FP3 Profit on total assets (\$) FP4 Profit per employee (\$) FP5 Return on equity (ROE) FP6 Gross margin (%) FP7 Operating Expense per Total License Fees (%) FP8 Return on investment (\$) FP9 Internal rate of return (%)
<b>Customer (operator) perspective</b>	CP1 Market share (%) CP2 Customer satisfaction index (%) CP3 Corporate image index (\$) CP4 License fee per operator (%) CP5 Operators per employees (No. or %) CP6 Average time spent on operator relations (No.) CP7 Operator rating (%) CP8 Cost per operator (\$) CP9 Number of operator complaints (No.)

**Table 2.8** Key Performance Indicators (KPIs) under the concept of the Balance Scorecard (BSC) (Cont.)

<b>Perspectives</b>	<b>Key Performance Indicators (KPIs)</b>
<b>Customer (operator) perspective</b>	CP1 Market share (%)
	CP2 Customer satisfaction index (%)
	CP3 Corporate image index (\$)
	CP4 License fee per operator (%)
	CP5 Operators per employees (No. or %)
	CP6 Average time spent on operator relations (No.)
	CP7 Operator rating (%)
	CP8 Cost per operator (\$)
	CP9 Number of operator complaints (No.)
<b>Business Process Perspective</b>	BPP1 Operating expense per total license fee (%)
	BPP2 License renewal time (No.)
	BPP3 On-time license service process (%)
	BPP4 Productivity Improvement (%)
	BPP5 Lead time, product development (No.)
	BPP6 Lead time, from order to delivery (No.)
	BPP7 Average time for decision-making (No.)
	BPP8 Average time of complaint handling (No.)
	BPP9 Operating expense per operator (%)
<b>Innovation and growth perspective</b>	IGP1 Training hours per employee (No.)
	IGP2 Employee satisfaction index (%)
	IGP3 Leadership development expense per employee (\$)
	IGP4 Employee turnover (%)
	IGP5 Investment in process innovation per license revenue (%)
	IGP6 Investment in knowledge management per operators (No.)
	IGP7 Suggested improvements per employee (\$)
	IGP8 Absenteeism rate (%)
	IGP9 Direct communications to operators/year (No.)

## 2.8 The Analytic Hierarchy Process (AHP)

The literature review of the Analytic Hierarchy Process (AHP) aims to gain the knowledge of the AHP to apply to rank the priority of the important level of the Critical Success Factors (CSFs) of Organisational Change Management as well as the Key Performance Indicators (KPIs) of the Business Process Management (BPM) in order to develop CSFs Taxonomy of the Organisational Change Management and KPIs Taxonomy of the Business Process Management (BPM).

Yazadani et al. (2013) argue that decision making is considered as the basic characteristic of human being and every person has to make a lot of decisions during his lifetime. The quality of decision making is more critical when the responsibilities increase with plenty of multi-criteria problems or issues that have to be fixed. Therefore, the problem criteria must be examined in different making decisions. The Analytic Hierarchy Process (AHP) is one of the most appropriate methods in multi-criteria decision making, which proposed first time by Thomas L. Saaty in 1970s. AHP is the subject current research and development efforts because it is simple and comprehensive. Lankarani and Asadi (2012) argue that main objective of using AHP is to form a group of existing alternatives for locating relative priorities. Saaty (2001) argues that AHP is a logical problem-solving framework to develop a simultaneous response to collective consciousness integration through judgement of decision-making results and through hierarchical factors. AHP has been developed for personal internal capability to enable paired comparison which uses knowledge, data, and experience to predict the relative paired comparison. The paired comparisons are applied to develop hierarchy in the ratio scale of both intangible and tangible, which can classify the problem or issue into smaller components in order to determine the causes of problem or issue analysis and to develop solutions.

In addition, Saaty (2001) argues that AHP consists of three principles 1) the principle of constructing hierarchy 2) the principle of establishing priorities and 3) the principle of logical consistency. These principles are crucial to problem solving by explicit logical analysis.

The Analytic Hierarchy Process (AHP) has adopted this process. Relationships between the components of each level of the hierarchy are created through comparing

the components in pairs. These relationships represent the relative impact of the components at a given level for each component at the next higher level. In this context the latter component serves as a criterion and is called a “property”. The result of this discriminatory process is a “vector of priority”. This pairwise comparison is repeated for all the components at each level. The final step is to move down the hierarchy by weighing each vector according to the priority of its property. The component with the highest weight is the one that merits the most serious consideration for action, although others are not ruled out entirely.

Logical consistency: consistency has two meanings. The first is that similar ideas or objects are grouped according to homogeneity and relevance. The second meaning of consistency is that the intensities of relations among ideas or objects, based on a criterion, justify each other in some logical way.

### **Consistency measurement**

The consistency measurement of the AHP approach results can be measured through the matrix, which is measured as  $\lambda_{max}$  (lambda max). Consistency Index =  $(\lambda_{max} - n) / (n-1)$  where  $n$  = number of elements being compared, and Consistency Ratio = Consistency Index / Random Consistency that should not be greater than 10 percent of the consistency random adjustment in order to be considered as an acceptable consistency. However, the perfect consistency is very difficult to achieve. The overall AHP consistency ratio of less than 5 percent is considered as good consistency, and less than 20 percent is considered to be acceptable. (Saaty, 2001).

Dev and Kumar (2016) argue that AHP can be used to identify as well as to prioritise the Critical Success Factors (CSFs) of the organisational change through Business Process Management (BPM) of the original equipment manufacturing industry to increase its competitive advantage from enhancing agility level and performance. Yazdani et al. (2013) argue that AHP is very useful multi-decision making tool to prioritise the CSFs of the organisational change management to improve the Total Quality Management (TQM) implementation of the business processes. The organisation can focus on the most CSFs to ensure that the Total Quality Management (TQM) is able to implement successfully. The total quality improvement provides the sustainable

competitive advantage for the organisation. I agree with that the ability to identify and prioritise the CSFs is very important for the organisation to make high quality decision making because the organisational resource is limited; therefore, it should be allocated to the most CSFs in order to gain the highest resource utilisation.

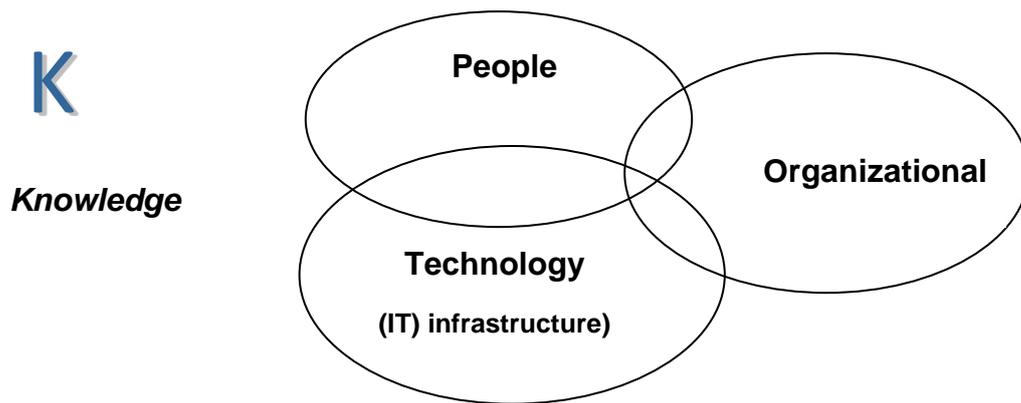
## **2.9 Knowledge Management (KM)**

The literature review of the Knowledge Management (KM) aims to learn the concepts and theories of the Knowledge Management (KM). The literature review also explores relationship between Knowledge Management (KM) and Organisational Change Management as well as Business Process Management (BPM).

### **The Concepts and Theories of the Knowledge Management (KM)**

Blackler (1995) argues that knowledge is multifaceted and complex, which is both implicit and explicit knowledge. Knowledge is dynamic and static as well as physical and mental. Nonaka (1991) argues that knowledge is held either individual or collectively. Armstrong (2003) argues that it is helpful to explain the differences among data, information and knowledge. Data is the fundamental facts for information and knowledge. Information is the data that has gone through the processes with meaning and purpose for individuals to access. Knowledge is information that can be used as well as to distribute for the purposed usage.

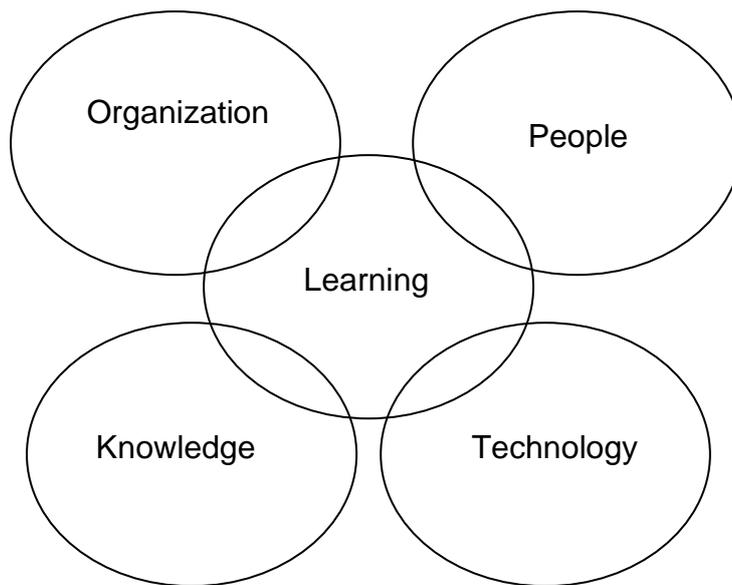
Malhotra (2000) commends that Knowledge Management (KM) is apply knowledge to survive in a dynamic changing environment. The KM focuses on doing the right things rather than doing the things right. Award and Ghaziri (2004) argue that knowledge management (KM) is a newly emerging, interdisciplinary business model that has knowledge within the framework of an organization as its focus. It is rooted in many disciplines, including business, economics, psychology, and information management. It is the ultimate competitive advantage for today's firm. Knowledge management involves people, technology, and processes in overlapping parts. as shows in figure 2.7.



**Figure 2.7** Overlapping human, organizational, and technological factors of KM

Source: Awad and Ghaziri (2004)

Marquardt (2002) argues that knowledge is becoming more important under the disruptive technology and globalisation. The organisations require continuous learning and knowledge to advance their products and services through changing business processes and organisational structure. Therefore, most organisations realise to adopt the learning organisation, which consists of five interactive subsystems as shown in figure 2.8. All five are important to secure survival and continuous organisational learning in order to sustainably succeed.



**Figure 2.8** Systems learning organization model

Source: Marqardt (2002)

Nonaka (1995) argues that the organisational knowledge consists of four patterns, which can be described as the following.

*Tacit to tacit:* This type of knowledge transfers knowledge from individual to another individual through coaching or teaching relationship.

*Explicit to explicit:* This form of knowledge is collected from existing explicit knowledge and then transfer across the organisations through existing learning within organisations.

*Tacit to explicit:* This kind of knowledge is developed when individual adapts existing knowledge as well as gives own inputs to create new knowledge and then shares across the organisation.

*Explicit to tacit:* This pattern of knowledge is made when new explicit knowledge is embedded into individual and then create new tacit knowledge.

In addition, Nonaka (1995) argues that all four kinds of knowledge are developed together continuously to create new knowledge for the organisations to adopt to build and sustain their competitive advantage.

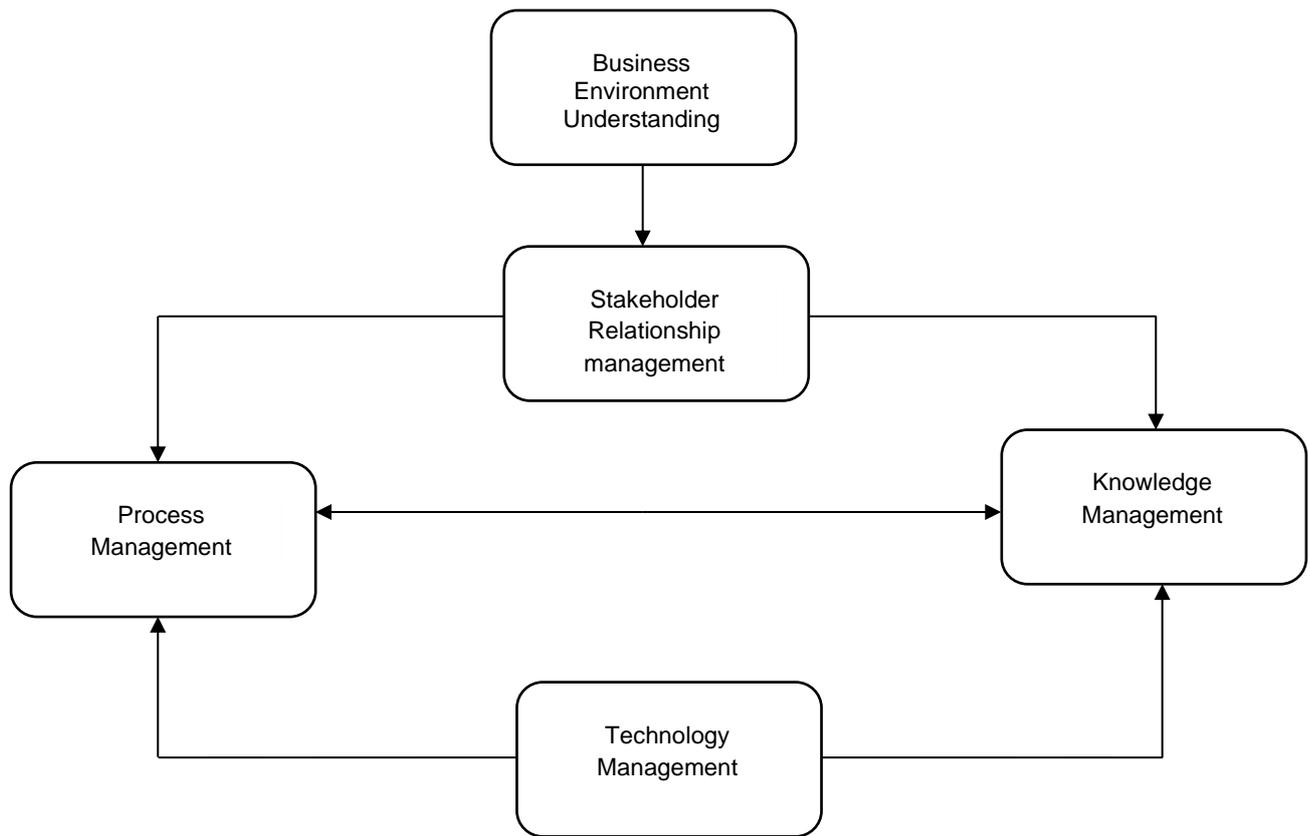
### **Knowledge Management (KM) and Organisational Change Management**

Knowledge Management (KM) strategies consist of personalisation and codification. Personalisation strategy is applied for people-to-people method to exchange of knowledge, which is considered as very old method (Davenport and Guest, 2001). In contrast, codification strategy is used for people-to—document as well as document-to-people strategy, which collects all relevant information at the central repository that authorised persons are able to access freely (Scheepers et al., 2004). However, Desouza and Evanristo (2004) argue that a hybrid approach of KM might be more suitable than relying only single strategy. Sheeper et al. (2004) propose organisational capability model using KM strategies to enhance readiness for change. In addition, Elrod and Tippett (2002) argue that the organisational change capability through readiness for change enables the organisation to implement organisational more successfully. I agree that the organisation must implement KM strategies to acquire and enhance the required knowledge for their employees to build up organisational capabilities to get ready to cope with the organisational change affected from the dynamic changing environment. Martensson (2000) supports that KM is considered as an important or essential factor for organisation to survive and maintain its competitive advantage as well as to cope with the external impacts through effective organisational change management. KM can also be viewed as the critical management tool for the organisation to use to build up capabilities for employees to get ready to manage the challenging of the change.

Park and Kim (2015) argue that the successful organisational change implementation requires essential knowledge at all organisational level. Therefore, the organisation must ensure that their KM process encourages knowledge sharing across their organisation. I agree with the authors that knowledge sharing is very critical for the successful organisational change implementation because the different employees have different knowledge and experience for example, engineers have engineering knowledge, top management have managerial knowledge, marketers have marketing knowledge. The successful organisational change implementation requires all knowledge and experience across functions; therefore, knowledge sharing is highly critical.

## **Knowledge Management (KM) and Business Process Management (BPM)**

Szelagowski (2019) argues that Business Process Management (BPM) and Knowledge Management (KM), which is both increasingly strengthen each other. The multiple failures of the Business Process Reengineering because of the failure to include the cultural factor as well as tremendous losses in knowledge; therefore, the organisations put hard efforts to conduct research to seek for the synergy of the BPM and KM. Figure 2.9 shows the mutual relations between critical fields in increasing business efficiency according to the synergy offers by the integration of BPM and KM. The cumulative knowledge of the BPM is transferred across the organisation through the KM enables the organisation to enhance its business process performance as well as efficiency continuously. I agree that the organisation at both individual and organisational levels should learn from the BPM to gather knowledge collectively in order to use that knowledge to improve the efficiency of the business process performance continuously. Schmid and Kern (2014) argue that the integration of BPM and KM enables the companies to enhance temporal, qualitative and cost of goods and services as well as to improve their innovative capacities. Petrovic et al. (2019) argues that the basic value creation factors, assets, and capital are decreasing their value tremendously, in contrast, the knowledge is growing significantly as the important factors for successful BPM. In addition, Meier and Weller (2012) argue that the successful BPM requires the critical knowledge to manage the business processes; therefore, the integration between BPM and KM provides the essential knowledge to succeed the BPM. Bitkowska (2020) argues that the integration of BPM and KM can gain the benefit that the knowledge management processes through the identification, acquisition, documentation, and implementation using the BPM. Marjanovic and Freeze (2012) argue that the integration of Knowledge KM enhances the organisational sustainable competitive advantage through the knowledge gained during the ongoing business process design and implementation, which is considered critical for the organisation to survive and compete in the highly dynamic changing environment. I agree that the organisation should embed the integration of BPM and KM because the effective BPM requires the critical knowledge to redesign business processes as well as to implement the business processes that match the particular processes.



**Figure 2.9** The integration between Business Process Management (BPM) and Knowledge Management (KM)

Source: Szlagowski (2019)

## 2.10 Summary

The reviewed literature suggests that the disruptive technology convergence of broadcasting and telecommunications influences the organisational change of the governmental regulatory organisations to implement the organisational change in order to cope with the dynamic changing technological environment. The Critical Success Factors (CSFs) are very important for the organisations to identify and focus on the most important CSFs, which can cause the organisational change management to be fail or successful. In addition, the Business Process Management (BPM) is critical to redesign and implement the business processes to support the organisational change success. The success of the BPM requires the performance measurement and management system to monitor and assess the business process activities compared with the

performance objectives and targets as well as to take essential corrective actions when the actual process performance is deviated from the desirable outcomes. Therefore, the Key Performance Indicators (KPIs) of the BPM is necessary to include into the BPM. The integration of Organisational Change Management and Knowledge Management (KM) as well as the integration of Business Process Management (BPM) and Knowledge Management (KM) shows highly benefits for the sustainable success of both Organisational Change Management and BPM. The action research (AR) shows that it is appropriate to conduct research in both Organisational Change Management and BPM. The literature review also suggests that the Analytic Hierarchy Process (AHP) is very useful multi-decision making tool to prioritize the CSFs of the organisational change management and to prioritize the KPIs of the Business Process Management (BPM). The research gap from the literature review is seeking for the CSFs Taxonomy of the Organisation Change Management as well as the KPIs Taxonomy of the BPM for the governmental regulatory organisation. In addition, the action plans to monitoring CSFs Taxonomy and KPIs Taxonomy are also developed. The next chapter explains the research methodology to fill the research gap as well as to answer the research questions and objectives.

## **CHAPTER 3**

# **METHODOLOGY**

### **3.1 Introduction**

The main purpose of chapter three is to discuss and analyze the research methods and principles that are used in the action research study. The discussion starts with the action research (AR) to explain the AR concept that is mainly used for this research study, research methods for action research (AR), Context of the study and research design strategy of the research to explain the research purpose, and the methods of collecting the data as well as the sources of the data. Other topics that are discussed in this chapter are the research framework, sample selection and size, instrument of data collection process and measurements, analysis of findings, validity and reliability, and ethics.

### **3.2 Action research (AR)**

#### **3.2.1 Origins and concept of the action research (AR)**

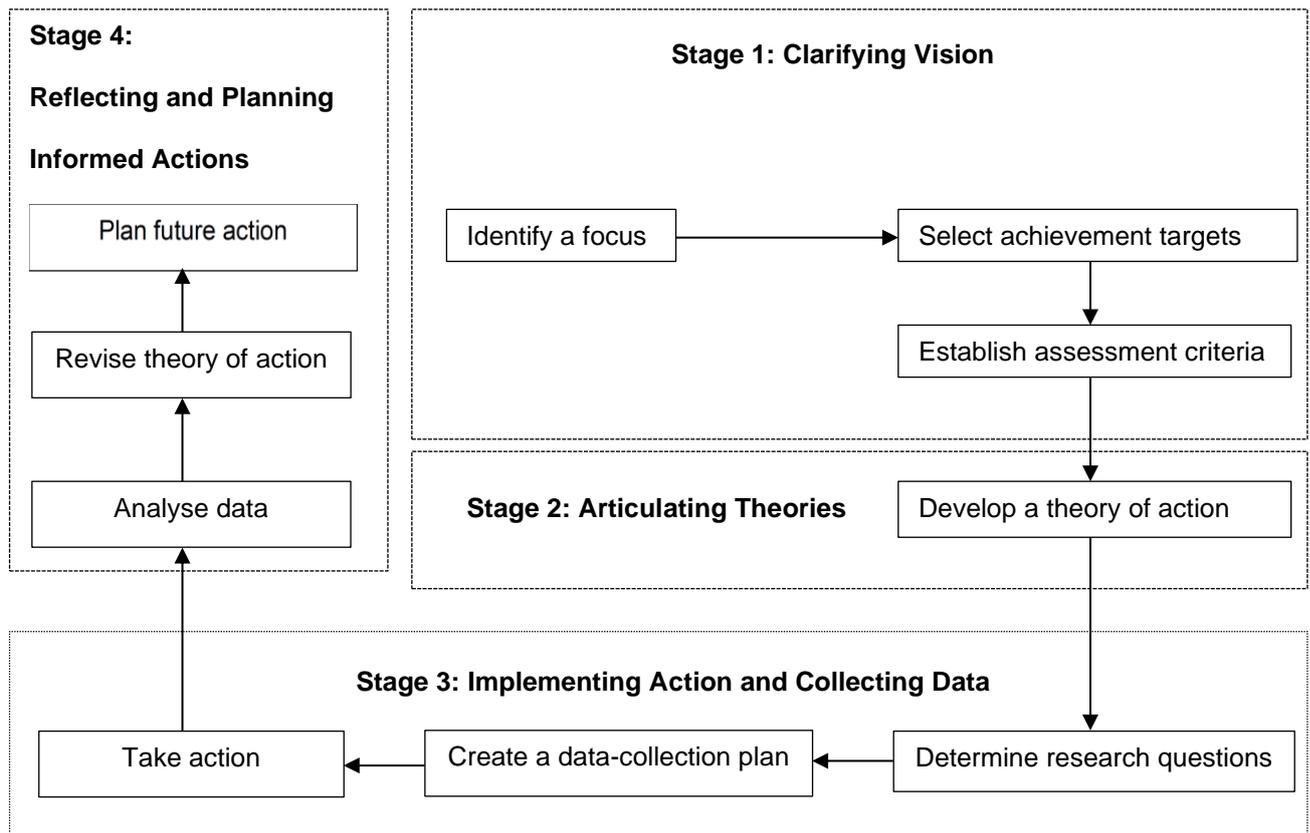
Mills (2018) argues that the origin of action research (AR) has been well documented and debated the term of action research around 1934. Lewin (1946, p.34) is often cited as the founder of action research and provides the definition as “research that will help the practitioner to generate knowledge about the social system while, at the same time attempting to change it”. Sagor and Williams (2017, p.6) define the action research as “any investigation conducted by person or the people empowered to take action concerning their own actions, for the purpose of improving their future actions”. I agree with the authors that the action research enables the researcher to seek for the necessary information to take actions to solve the current issues or problems as well as to improve for their future.

Coghlan and Brannick (2014) argue that the action research has been a very useful research methodology which enables the organisation to conduct valuable

research project to identify and analyse the organisational workplace-based problems, as well as to further develop an effective solution to solve workplace-based problems successfully. I agree that the action research is very useful research methodology for the organisation to conduct to seek for the organisational problems or issues, which can gather the essential information from the relevant stakeholders at both internal and external workplace because they directly involve with the actual useful relevant information of the organisation.

Coghlan and Brannick (2014) describe that there are four action steps for organisational action research. (1) Construction is a way to gather information from the relevant organisational stakeholders to seek workplace-based problems or issues. (2) Planning action is the planning step to follow the identified workplace-based problems or issues and to plan for action research implementation. (3) Taking action is the process of implementing the action research project according to the action research plans. (4) Evaluating action is the process of examining the actual results of the action research project to compare with the initial construction and consider the performance gap in order to provide useful information for corrective actions of the next action research cycles of construction, planning, taking action and evaluating action. Putman and Rock (2018) argue that Kurt Lewin propose the concept of the action research to begin with an objective to reach then proceed in a spiral of stages of analysis, fact-finding, planning, and execution (Lewin, 1946).

Sagor and Williams (2017) propose the action research (AR) into four sequential stages as shows in figure 3.1.



**Figure 3.1:** Action research cycle

Source: Sagor, R.D., & Williams, C. (2017)

The action research cycle from figure 3.1 consists of four stages, which can be explained in detail as the following.

#### Stage 1: Clarifying Vision and Targets

In stage 1, the action researchers identify their goals and the specific criteria to be used with validity and reliability to record changes in the goal performance.

#### Stage 2: Articulating Theory

In stage 2, the action researchers identify and articulate the theory of action to pursue the alternative strategies to achieve the goals of the action research.

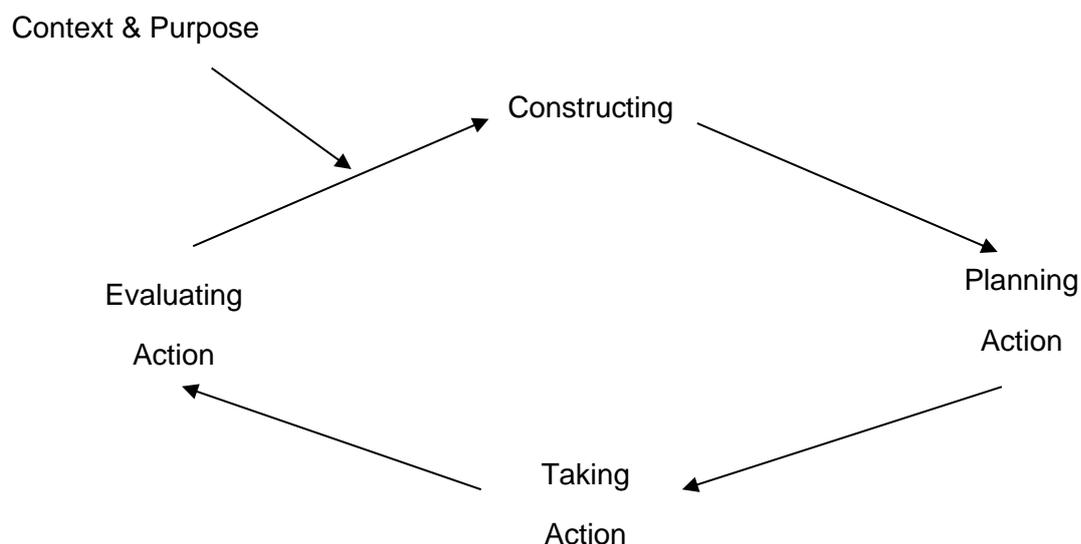
#### Stage 3: Implementing Action and Collecting Data

In this phase, the action researchers carry out through theory of action through systematically data collection to help understand the problems or issues as well as the relationship of the actions taken and the obtained results.

#### Stage 4: Reflecting on the Data and Planning Informed Action

In the final stage, is the first lap around the action research cycle, which the action research can revisit their initial visions, goals, and objectives, as well as theory of action according to the collected data, which can be used as the basis for their future action.

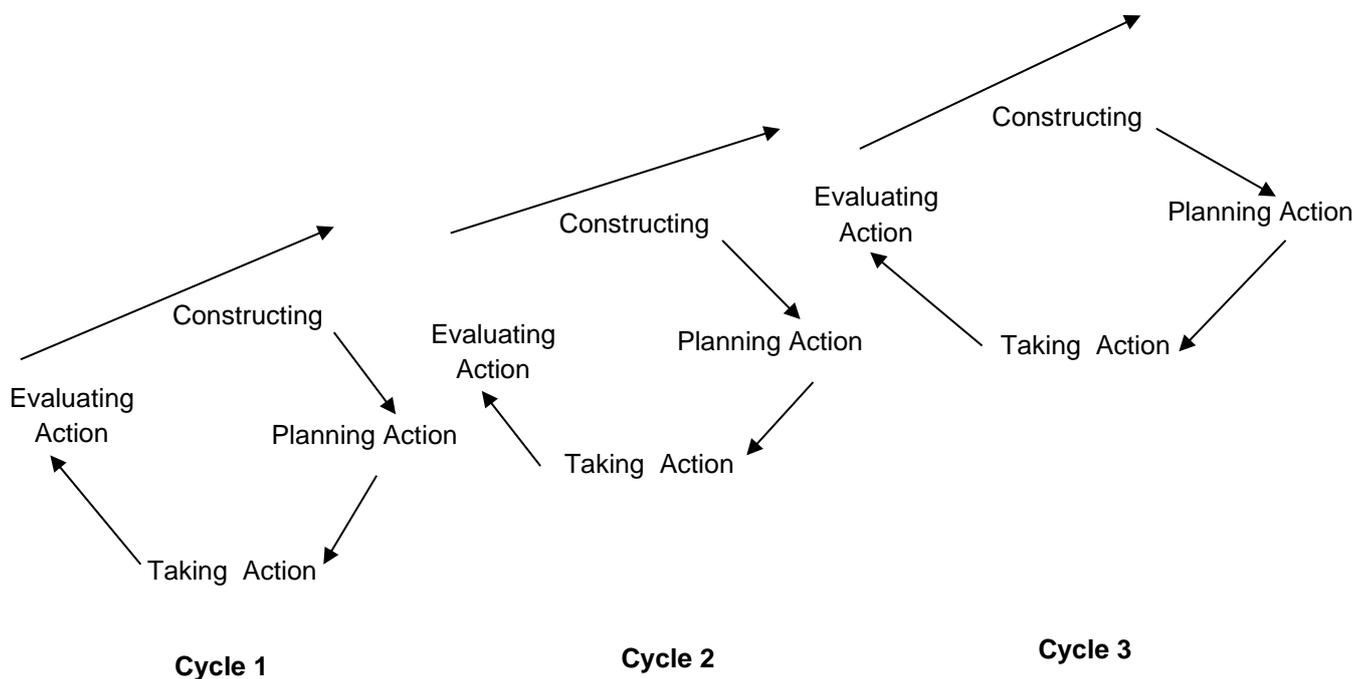
Coghlan (2019) argues that the action research cycle consists of pre-step and three core activities: planning, action and fact-finding. The pre-step identifies the general objective. Planning is the step to formulate the overall plan to make decision for what should be the first action step. Action is taking the first action step, and fact-finding is the evaluating for the first step for the lesson learned, and then creates the corrective actions for the next step. Therefore, there is a continuing spiral step, each spiral of step consists of a circle of planning, action, and fact-finding about the result of action. Figure 3.2 shows the action research cycle.



**Figure 3.2:** The Action Research Cycle

Source: Coghlan (2019)

In addition, Coghlan (2019) argues that any action research project normally consists of multiple action research cycles operating concurrently as the spiral of action research cycles as shows in figure 3.3. I agree with the author that the action research should consist of multiple research cycles because the fact-finding of the first actions research can be used as the basic information to make decision to take corrective action of the prior action step that might not fulfil the action research goals and objectives. Moreover, the results of the first action research cycle can also be used for the future action research step of the next action research cycles, which this continuing action cycles will make the action research to reach the goals and objectives at the end. In addition, I also believe that the spiral of action research cycles is appropriate for me to apply for my action research (AR) study because the action research cycles enable me to seek for the research data from the in-depth and semi-structured interview from nine participants as the interview cycles to gain required data and then used the initial data to seek for more detailed data as the learning cycles.



**Figure 3.3:** Spiral of Action Research Cycles

Source: Coghlan (2019)

### **3.3 Context of the study and research design strategy**

Rock and Putman (2018) argue that typical research methods for action research consist of two research methods, which are quantitative research, qualitative research and mix research methods. (1) The quantitative research method normally is applied to prove or disprove a hypothesis about specific event that is analysed. The measurement of the numeric computation includes variability typically computes in form of range, standard deviation, central tendency, mean, median, and mode. The quantitative data also can be used for graphic comparison as well as to use the statistical analysis to analyse variance or correlation to investigate relationships or comparison to seek for the statistical significance. (2) The qualitative research method is normally applied by using descriptive data to construct an understanding of a specific situation or phenomenon. In addition, qualitative research method can gain the benefit of the adaptability to the context or conditions at the place that the research is conducted to construct meanings or theories through the broader set of data interpretation.

Ivankova (2015) argues that mixed methods research is increasingly applied for social, behavioral, and health sciences. The major reason that mixed methods research becomes highly use because of its ability to identify issues or problems more comprehensively. Wingo and Ivankova (2018) argue that mixed methods have the capacity to intersect with other research methods, such as action research through integrating the research methodological basis with creative approach to identify complicated problems. Conceptual, philosophical, and procedural commonalities between mixed methods and action research enable effective integration. The integration of the two research methods is able to make more scientifically effective and transferable outcomes through synergistically integrating qualitative stakeholder engagement with quantitative results to inform action/intervention planning, implementation, evaluation, and monitoring.

There are two contexts of this study. The first context of the study involves the identification of the Critical Success Factors (CSFs) of the Organisational Change Management of the new combined broadcasting and telecommunication licensing bureau of the Office of the National Broadcasting and Telecommunications Commission (NBTC). These CSFs are further used to develop the CSFs Taxonomy of the Organisational Change Management as a management tool to monitor the impacts of the disruptive

technology convergence of the broadcasting and telecommunications on the Organisational Change Management continuously in order to take appropriate corrective actions.

The second context of this study aims to redesign the business process of the Business Process Management (BPM) and to develop the Key Performance Indicators (KPIs) Taxonomy to support the successful Organisational Change Management of the new combined broadcasting and telecommunications licensing bureau of the NBTC. The first action cycle is to redesign the existing business process of the newly combined broadcasting and telecommunications licensing bureau. The other action cycles are applied to develop the KPIs Taxonomy of the BPM as a management tool to monitor, evaluate, and take corrective actions of the business process performance based on the measurement KPIs Taxonomy compared with the desirable outcomes.

Tashakkori and Creswell (2007) argue that the mixed methods research enables the researchers to collect, analyse, and integrate both quantitative and qualitative data more convincing and credible. I agree to apply the mixed methods research for this study because it is more powerful research tool to provide better approach for the researchers to be able to gather in-depth data from the qualitative research method and at the same they can take the advantages of the quantitative research method to analyse and present the research data using statistical analysis to make the research outcomes more complete than the single research method either quantitative research method or qualitative research method. The qualitative research is applied to seek an answer to the research question concerning the CSFs of the Organisational Change Management and the BPM in the Disruptive Technology Convergence of broadcasting and telecommunications of the NBTC, which is Governmental Regulatory Organisation. The reason for using qualitative research is to conduct an in-depth inquiry, which aims to find out the qualitative evidence that can create new knowledge on Organisational Change Management and the BPM. A qualitative research method is conducted for this action research to conduct the in-depth interview nine participants, including senior executives and senior directors of the NBTC, senior executives of the broadcasting operators, senior executives of the telecommunication operators, and a senior academic researcher, in order to gather the research data. The action research can be proceeded in two phases. **Phase 1** concentrates on the development of the CSFs Taxonomy of the Organisational Change Management of the new combined broadcasting and telecommunication

licensing bureau of the NBTC. **Phase 2** focusses on the Business Process Management (BPM) to redesign the business processes as well as the development of the Key Performance Indicators (KPIs) of the BPM of the new combined broadcasting and telecommunications licensing bureau of the NBTC. In addition, I select the Analytic Hierarchy Process (AHP) for both quantitative and qualitative approach because it incorporates both the quantitative and qualitative aspects of human thought: the qualitative approach is to define the problem and its hierarchy, and the quantitative approach is to express concise judgment and preference. The process itself is designed to integrate these dual properties. It clearly shows that for enhanced decision making the quantitative approach is basic for making sound decisions in complex situations where it is necessary to determine priorities and make trade-offs. In summary, AHP is a practical way to deal quantitatively with different kinds of functional relations in a complex network. This ability also allows me to integrate hard data with subjective judgments about intangible factors during the priority ranking of the importance from nine participants' inputs among CSFs Taxonomy as well as KPIs Taxonomy. However, the descriptive statistical analysis is also applied for the quantitative research of this study.

### 3.4 Research framework

The overall research framework is executed in two phases, which are applied from the Spiral of Action Research Cycles suggested by Coghlan (2019) that shows in figure 3.3. The research action cycles are shown in table 3.1 that **Phase 1** consists of three action cycles. Action cycle 1 is to develop the final list of initial CSFs of the Organisational Change Management of the new combined broadcasting and telecommunications licensing bureau of the NBTC. Action cycle 2 is to develop the CSFs Taxonomy of the Organisational Change Management of the NBTC. Action cycle 3 is to validate the acceptability and the usefulness of the CSFs Taxonomy as well as to validate the contributions of the CSFs Taxonomy to Organisational Change Management and Knowledge Management (KM) as the management tools to monitor the impacts on CSFs Taxonomy of the Organisational Change Management of the new combined broadcasting and telecommunications licensing bureau of the NBTC. In table 3.2 shows that **Phase 2** consists of four action cycles. Action cycle 1 is to develop the new redesign of the business processes of the Business Process Management (BPM) of the new combined

broadcasting and telecommunications licensing bureau of the NBTC. Action cycle 2 is to develop the final list of the initial Key Performance Indicators (KPIs) of the BPM. Action cycle 3 is to develop the KPIs Taxonomy of the BPM. Action cycle 4 is to validate the acceptability and the usefulness of the KPIs Taxonomy as well as to validate the contributions of the KPIs Taxonomy to the Knowledge Management (KM) as the management tool to monitor the impacts on KPIs Taxonomy of the BPM of the newly combined broadcasting and telecommunications licensing bureau of the NBTC.

**Table 3.1** Phase 1: Develop the Critical Success Factor (CSFs) Taxonomy of the Organisational Change Management

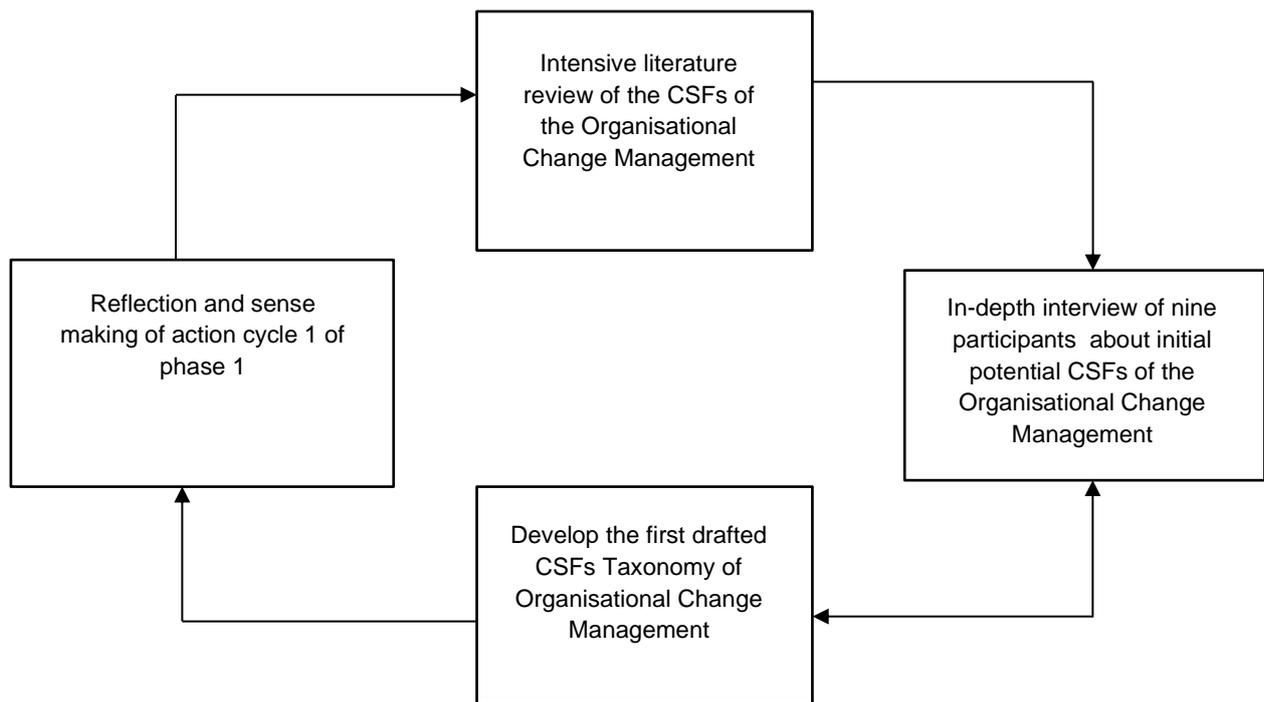
Action Cycles	Action Steps
<p><b>1. Action Cycle 1 of Phase 1:</b> Develop the first drafted CSFs Taxonomy of the Organisational Change Management</p>	<pre> graph LR     A[Reflection and sense making of action cycle 1 of phase 1] --&gt; B[Intensive literature review of the CSFs of the Organisational Change Management]     B --&gt; C[In-depth interview of nine participants about initial potential CSFs of the Organisational Change Management]     C --&gt; D[Develop the first drafted CSFs Taxonomy of Organisational Change Management]     D --&gt; A   </pre>
<p><b>2. Action Cycle 2 of Phase 1:</b> Develop the final CSFs Taxonomy of the Organisational Change Management</p>	<pre> graph LR     E[Reflection and sense making of action cycle 2 of phase 1] --&gt; F[Refine first drafted &amp; develop second drafted CSFs Taxonomy of the Organisational Change Management]     F --&gt; G[Rank the list of the second drafted CSFs Taxonomy and verify the reliability using AHP]     G --&gt; H[Develop the final CSFs Taxonomy of the Organisational Change Management]     H --&gt; E   </pre>

**Table 3.1** Phase 1: Develop the Critical Success Factor (CSFs) Taxonomy of the Organisational Change Management (cont.)

Action Cycles	Action Steps
<p><b>3. Action Cycle 3 of Phase 1:</b> Validate the acceptability, usefulness, and contributions of the CSFs Taxonomy of the Organisational Change Management</p>	<pre> graph LR     A[Reflection and sense making of action cycle 3 of phase 1] --&gt; B[Validate the acceptability and usefulness of the CSFs Taxonomy to Organisational Change Management]     B --&gt; C[Validate the contributions of the CSFs Taxonomy to Knowledge Management (KM)]     C --&gt; D[Validate the contributions of the CSFs Taxonomy to Organisational Change Management] </pre>

To achieve this research framework objectives, the following activities are carried out as the following.

**Phase 1:** The phase 1 aims to develop the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management consists of three action cycles, which are elaborated in table 3.1 and explained in detail of each action cycle from figure 3.4, figure 3.5 to figure 3.6 as follow.



**Figure 3.4** Action cycle 1 of phase 1

### **Action cycle 1 of phase 1**

The action cycle 1 of phase 1 is shown in figure 3.4, which aims to develop the drafted Critical Success Factors (CSFs) of the Organisational Change Management of the new combined broadcasting and communications licensing bureau of the NBTC. This action cycle consists of 4 action steps and can be described as follows.

**Action step 1: Intensive literature review of the CSFs:** The intensive literature review of the CSFs of the Organisational Change Management is reviewed and then to develop the list of the initial potential CSFs of the Organisational Change Management.

**Action step 2: In-depth interview of nine participants about initial potential CSFs of the Organisational Change Management:** The in-depth interview of nine participants is conducted to seek for their opinions to about the proposed list of potential CSFs from the intensive literature review as well as their additional inputs to adjust the list of initial potential CSFs in the next action step.

**Action step 3: Develop the first drafted CSFs Taxonomy of the Organisational Change Management:** This step is to adjust the proposed initial potential CSFs from the intensive literature review with the inputs from the interview of nine participants. The first drafted CSFs Taxonomy of the Organisational Change Management is also developed at this action step.

**Action step 4: Reflection and sense making of action cycle 1 of phase 1:** The action step 4 aims to reflect as well as sense making of action cycle 1 of phase 1.

### **Action cycle 2 of phase 1**

The action cycle 2 of phase 1 is shown in figure 3.5, focusses on developing the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the new combined broadcasting and telecommunications licensing bureau of the NBTC. This action cycle consists of 4 action steps and can be described as follows.

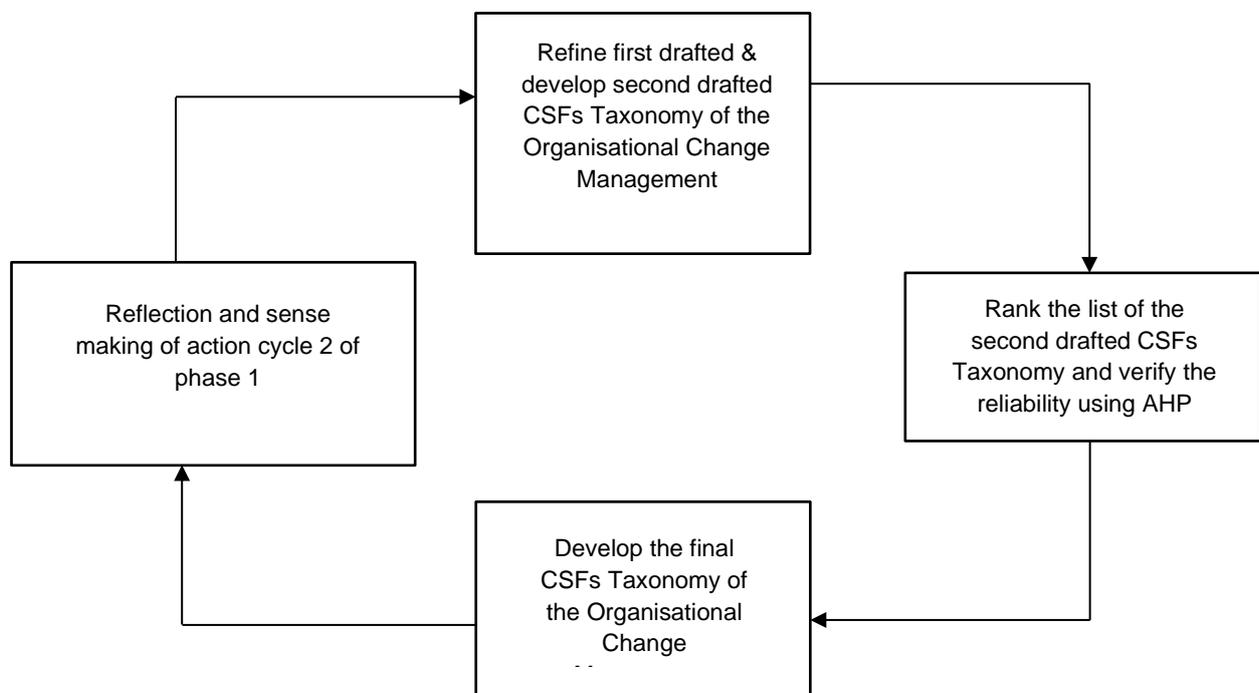
**Action step 1: Refine the first drafted and develop of the second drafted CSFs Taxonomy of the Organisational Change Management:** The first drafted CSFs Taxonomy of the Organisational Change Management is refined from action cycle 1 of phase 1 to be developed as the second drafted CSFs Taxonomy. The final CSFs Taxonomy is further developed from the second drafted CSFs at the action step 2 of action cycle 2 of phase 1.

**Action step 2: Rank the list of second drafted CSFs and verify the reliability using AHP:** This step consists of two parts. Part 1 is the process of having nine participants to rank the list of the second drafted CSFs and Part 2 aims to verify the reliability, which both parts are applied the statistical tool of the Analytic Hierarchy Process (AHP) through a priority scale from 1 to 9 (see table B4, appendix B) to pairwise

to rank the Critical Success Factors (CSFs) through the interview of the nine participants to be classified into three classes (1) class A (most important CSFs, (2) Class B (second most important CSFs), and (3) class C (third most important CSFs).

**Action step 3: Develop the final CSFs Taxonomy of the Organisational Change Management:** The action step 3 aims to develop the final CSFs Taxonomy of the Organisational Change Management.

**Action step 4: Reflection and sense making of action cycle 2 of phase 1:** The action step 4 aims to accomplish reflection and sense making of action cycle 2 of phase 1



**Figure 3.5** Action cycle 2 of phase 1

### **Action cycle 3 of phase 1**

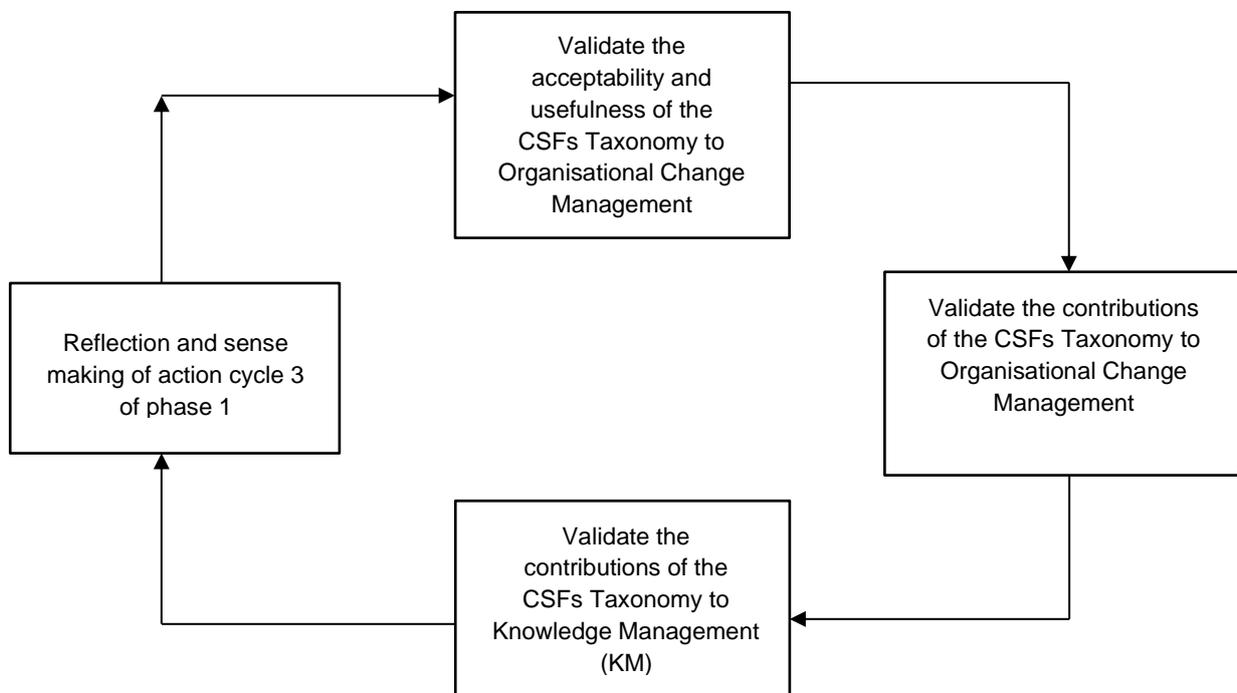
The action cycle 3 of phase 1 shows in figure 3.6 consists of four action steps, which can be elaborated as follows.

**Action step 1: Validate the acceptability and usefulness of the CSFs Taxonomy to Organisational Change Management:** The nine participants are interviewed to provide their inputs to validate the acceptability and usefulness of the CSFs Taxonomy to the Organisational Change Management.

**Action step 2: Validate the contributions of the CSFs Taxonomy to Organisational Change Management:** The nine participants are semi-structured interviewed to provide their inputs to validate the contributions of the CSFs Taxonomy to the Organisational Change Management.

**Action step 3: Validate the contributions of the CSFs Taxonomy to Knowledge Management (KM):** The nine participants are semi-structured interviewed to provide their inputs to validate the contributions of the CSFs Taxonomy to the Knowledge Management (KM).

**Action step 4: Reflection and sense making of action cycle 3 of phase 1:** The action step 4 aims to accomplish reflection and sense making of action cycle 3 of phase 1



**Figure 3.6** Action cycle 3 of phase 1

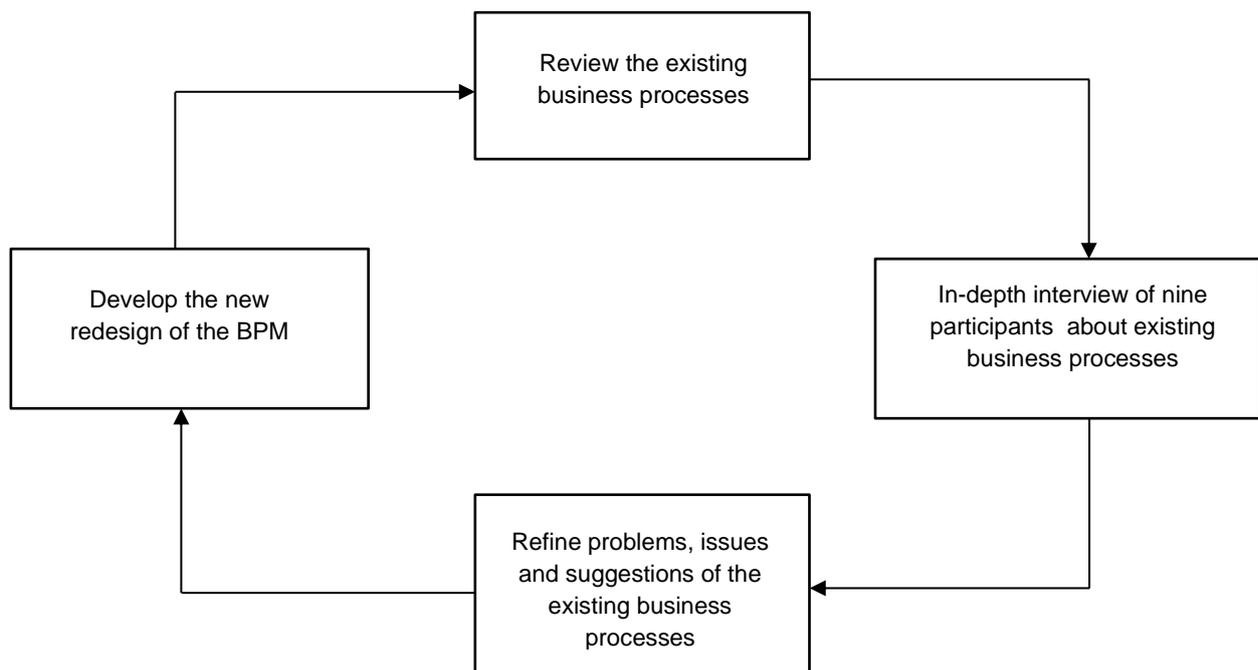
**Table 3.2** Phase 2: Develop the new redesign of the business processes of the Business Process Management (BPM) and the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM)

Action Cycles	Action Steps
<p><b>1. Action Cycle 1 of Phase 2:</b> Develop the new redesign of the BPM</p>	<pre> graph TD     A[In-depth interview of nine participants about existing business processes] --&gt; B[Refine problems, issues and suggestions of the existing business processes]     B --&gt; C[Develop the new redesign of the BPM]     C --&gt; D[Review the existing business processes]     D --&gt; A           </pre>
<p><b>2. Action Cycle 2 of Phase 2:</b> Develop the drafted KPIs Taxonomy of the BPM</p>	<pre> graph TD     A[In-depth interview of nine participants about initial potential KPIs of the BPM] --&gt; B[Develop the drafted KPIs Taxonomy of the BPM]     B --&gt; C[Reflection and sense making of action cycle 3 of phase 2]     C --&gt; D[Intensive literature review of the KPIs]     D --&gt; A           </pre>

**Table 3.2** Phase 2: Develop the new redesign of the business processes of the Business Process Management (BPM) and the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) (cont.)

Action Cycles	Action Steps
<p><b>3. Action Cycle 3 of Phase 2:</b> Develop the final KPIs Taxonomy of the BPM</p>	<pre> graph TD     A[Reflection and sense making of action cycle 3 of phase 2] --&gt; B[Develop the final KPIs Taxonomy of the BPM]     B --&gt; C[Rank the final list of KPIs Taxonomy and verify the reliability using AHP]     C --&gt; D[Refine the drafted KPIs Taxonomy of the BPM]     D --&gt; A   </pre>
<p><b>4. Action Cycle 4 of Phase 2:</b> Validate the acceptability, usefulness, contributions of the KPIs Taxonomy of the BPM</p>	<pre> graph TD     A[Reflection and sense making of action cycle 4 of phase 2] --&gt; B[Validate the contributions of the KPIs Taxonomy to Knowledge Management (KM)]     B --&gt; C[Validate the acceptability and usefulness of the KPIs Taxonomy of the BPM to the BPM]     C --&gt; D[Validate the contributions of the KPIs Taxonomy to Organisational Change Management]     D --&gt; A   </pre>

**Phase 2:** The phase 2 focuses on the development of the new redesign of the business processes of the Business Process Management (BPM) and the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) of the new combined broadcasting and telecommunications licensing bureau, which consists of four action cycles, which are elaborated in table 3.2 and explained each action cycle in detail from figure 3.7, figure 3.8, figure 3.9 to figure 3.10.



**Figure 3.7** Action cycle 1 of phase 2

### **Action cycle 1 of phase 2**

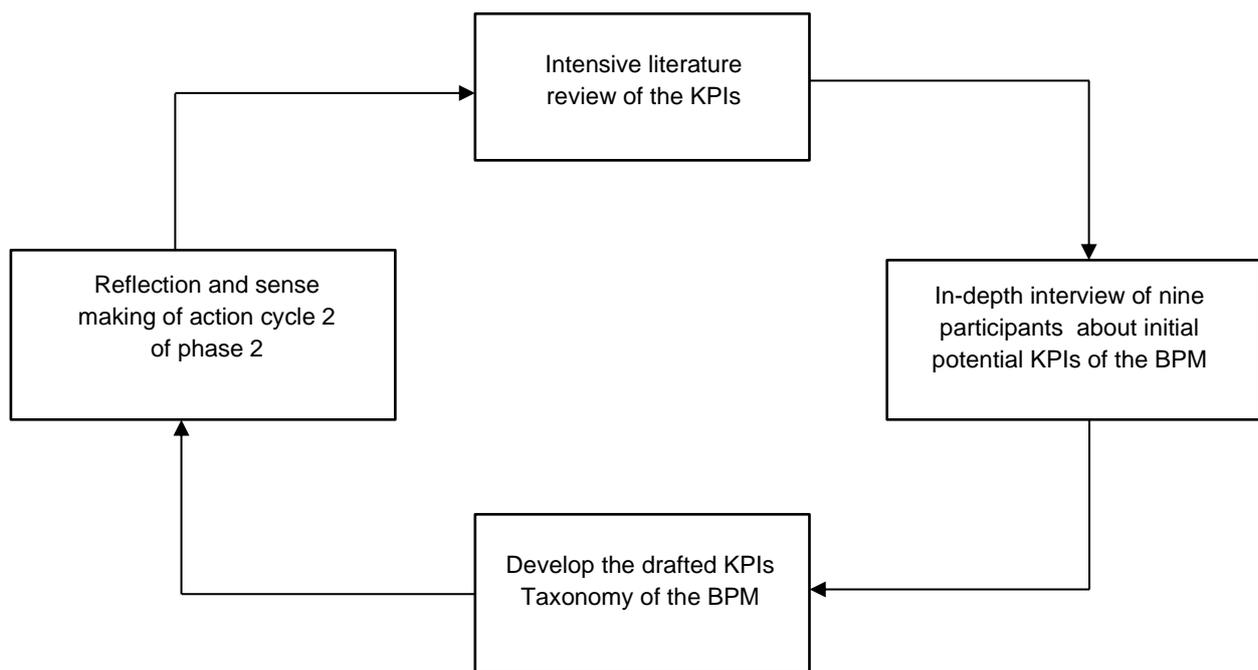
The action cycle 1 of phase 2 is shown in figure 3.7, which aims to develop the new redesign of the existing business processes of the new combined broadcasting and telecommunications licensing bureau. This action cycle includes 4 action steps as follows.

**Action step 1: Review the Existing Business Processes:** The review aims to understand the existing business processes of the new combined broadcasting and telecommunications licensing bureau of the NBTC in order to use for the action step 2.

**Action step 2: In-depth interview of nine participants about existing business processes:** The in-depth interview of nine participants is conducted to seek for their inputs for the current problems or issues as well as suggestions for the existing business processes of the new combined broadcasting and telecommunications licensing bureau.

**Action step 3: Refine problems, issues and suggestions of the existing business processes:** This step is to refine problems, issues and suggestions of the existing business processes of the new combined broadcasting and telecommunications licensing bureau from the inputs from the interview of nine participants.

**Action step 4: Develop the new redesign of the Business Process Management (BPM):** The action step 4 aims to develop new redesign of the BPM of the new combined broadcasting and telecommunications licensing bureau of the NBTC.



**Figure 3.8** Action cycle 2 of phase 2

### **Action cycle 2 of phase 2**

The action cycle 2 of phase 2 is shown in figure 3.8, which aims to develop the final initial list of the Key Performance Indicators (KPIs) of the Business Process Management (BPM) of the new combined broadcasting and telecommunications licensing bureau of the NBTC. This action cycle consists of 4 action steps and can be described as follows.

**Action step 1: Intensive literature review of the KPIs:** The intensive literature review of the KPIs is reviewed and then to develop the potential initial list of the KPIs of the BPM.

**Action step 2: In-depth interview of nine participants about the initial list of the KPIs:** The in-depth interview of nine participants is conducted to seek for their opinions to about the proposed list of potential KPIs from the intensive literature review as well as their additional inputs to adjust the list of initial potential KPIs in the next action step.

**Action step 3: Develop the drafted KPIs Taxonomy of the BPM:** This step is to develop the drafted KPIs Taxonomy of the BPM from the intensive literature review with the inputs from the interview of nine participants.

**Action step 4: Reflection and sense making of action cycle 2 of phase 2:** The action step 4 aims to achieve reflection and sense making of action cycle 2 of phase 2.

### **Action cycle 3 of phase 2**

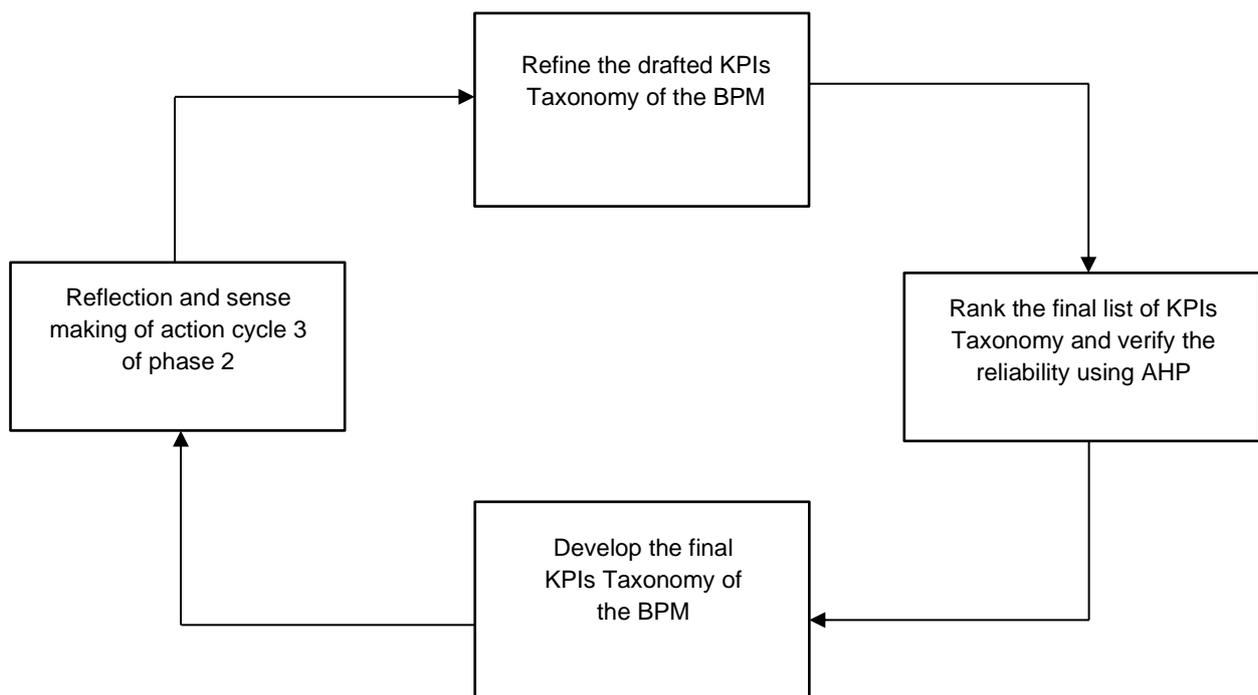
The action cycle 3 of phase 2 is shown in figure 3.9, focusses on developing the final Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) of the newly combined broadcasting and communications licensing bureau of the NBTC. This action cycle consists of 4 action steps and can be described as follows.

**Action step 1: Refine the drafted KPIs Taxonomy of the BPM:** The drafted KPIs Taxonomy is reconsidered whether it should be adjusted for the additional refinement before taking action step 2 of action cycle 3 of phase 2.

**Action step 2: Rank the final list of KPIs Taxonomy and verify the reliability using AHP:** This step consists of the process of having nine participants to rank the final list of KPIs and verify the reliability using the statistical tool of the Analytic Hierarchy Process (AHP) through a priority scale from 1 to 9 (see table B4, appendix B) to pairwise to rank the Key Performance Indicators (KPIs) through the interview of the nine participants to be classified into three classes (1) class A (most important KPIs, (2) Class B (second most important KPIs), and (3) class C (third most important KPIs).

**Action step 3: Develop the final KPIs Taxonomy of the BPM:** The action step 3 aims to develop the final KPIs Taxonomy of the BPM.

**Action step 4: Reflection and sense making of action cycle 3 of phase 2:** The action step 4 aims to achieve the reflection and sense making of action cycle 3 of phase 2.



**Figure 3.9** Action cycle 3 of phase 2

#### **Action cycle 4 of phase 2**

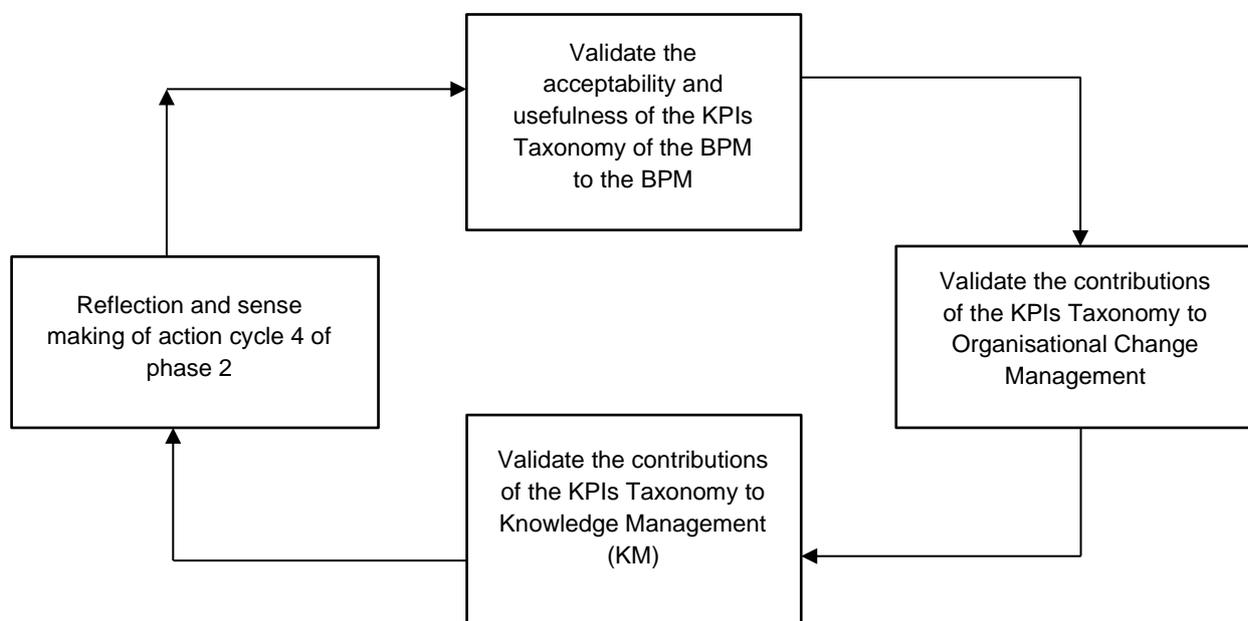
The action cycle 4 of phase 2 shows in figure 3.10 consists of four action steps, which can be elaborated as follows.

**Action step 1: Validate the acceptability and usefulness and of the drafted KPIs Taxonomy to BPM:** The action step 1 aims to validate the acceptability and usefulness of the drafted KPIs Taxonomy to the BPM through the expertise of the semi-structured interview with nine participants.

**Action step 2: Validate the contributions of the KPIs Taxonomy to Organisational Change Management:** The nine participants are semi-structured interviewed to provide their inputs to validate the contributions of the KPIs Taxonomy to the Organisational Change Management.

**Action step 3: Validate the contributions of the KPIs Taxonomy to Knowledge Management (KM):** The nine participants are semi-structured interviewed to provide their inputs to validate the contributions of the KPIs Taxonomy to the Knowledge Management (KM).

**Action step 4: Reflection and sense making of action cycle 4 of phase 2:** The action step 4 aims to reflect as well as sense making of action cycle 4 of phase 2.



**Figure 3.10** Action cycle 4 of phase 2

### 3.5 Sample selection and size

Ivankova (2015) argues that there are two types of samples: probability/nonprobability samples and purposeful samples, which are associated with the quantitative and qualitative research approaches, respectively. The difference between these two types of samples lies in whether the study participants are selected randomly, providing an equal opportunity for each individual to be chosen or selected intentionally or purposefully, choosing only who have experience with or knowledge about the studied phenomenon or issue. Qualitative purposeful samples tend to be small, because the purpose is to understand the individuals' experiences about a phenomenon or an issue in more depth. The size of a quantitative sample is calculated, taking into account the degree of the statistical power and effect sizes for determining the significant effect. The size of a qualitative purposeful sample is determined based on whether a researcher has achieved saturation that is the point in data collection and analysis at which additional individuals or cases do not provide new information. In this action research is considered as the case study research of the Office of the National Broadcasting and Telecommunication Commission (NBTC), and I applies the purposive sampling because I wish to to recruit participants who can provide in-depth and detailed information about my action research study. According to Saunders, et al. (2020) argue that purposive sampling enables the researchers to use their judgement to select cases that will best enable them to answer their research questions and to meet their objectives such as to recruit participants who can provide in-depth and detailed information about the phenomenon under investigation. This form of sample is often when working with very small samples such as case study and when the researchers wish to select cases that are particularly informative.

The sample sizes of my action research study consists of 9 participants, which is considered enough number of the participants for my purposive sampling, which is aligned with Daniel (2012) who argues that the typical sample sizes of the purposive sampling depend on the types of the purposive sampling include case study research consists of 3 to 5 participants and phenomenological research consists of 6 to 10 participants. Lyon and Hardesty (2005) argue that the qualitative study of contemporary traditional healing uses 8 participants of healers with good reputation for the interview.

The recruitment procedure for the participants was to choose qualified participants who are the senior executives, directors, or academic researchers, and that have considerable working experience in broadcasting organisations, telecommunications organisations, or academic researchers in the broadcasting and telecommunications industries, as this study seeks knowledge of Organisation Change Management in the broadcasting and telecommunications industries. The participants must have a high level of experience in the broadcasting and telecommunication industries in Thailand. The inputs for this action research are extremely valuable for this study and the public benefit. The major reason to include the academic researcher into the participants because this study seeks for both academic knowledge and working experience in Organisational Change Management of the broadcasting and telecommunications from the participants, which can apply good mix between academic knowledge and working experience. The choosing of participants' criterion can be summarized as follows.

(1) Senior executives, directors, and academic researchers who have considerable experience at least 20 years in the broadcasting and telecommunication industries of Thailand, as this research study requires their judgement and consideration of the Organisational Change Management, and the qualitative judgement and consideration requires the experience of senior executives, directors and academic researchers who have considerable experience in broadcasting and telecommunications industries in Thailand.

(2) The senior executives, directors, and academic researchers who are involved in the Organisational Change Management, as they have direct experience and have played a leadership role in the Organisational Change Management that can provide a direct inputs and contributions of Organisational Change Management.

The size of the sampling participants is nine persons and includes two participants from the representatives of the Telecommunications Association, two participants from the representatives of the Broadcasting Association, four participants from the senior executives of the Office of the National Broadcasting and Telecommunication Commission (NBTC), and one participant from academic researcher. The number of nine participants is considered sufficient to cover the relevant representatives of the stakeholders who represent all group of the relevant stakeholders that are impacted and are involved in the disruptive technology convergence of the Broadcasting and

Telecommunication industries in Thailand. The selected nine participants can be summarised as follows.

1. Four senior executives of the NBTC change management team are selected based on their willingness to participate this study without coercion from the insider researcher who is their supervisor.

2. Two senior executives of the broadcasting operators are nominated from Broadcasting Association of Thailand.

3. Two senior executives of the telecommunications operators are nominated from the Telecommunications Association of Thailand.

4. One senior academic researcher is selected based on the academic knowledge and working experience in broadcasting and telecommunications industry.

Therefore, all nine participants represent all relevant stakeholders of broadcasting and telecommunications industry, which are considered enough number to cover for this action research study.

## **3.6 Instrument**

Leedy and Ormrod (2019) argue that some research problems practically for both quantitative and qualitative data. These problems call for mixed-methods research. Such research involves not only collecting, analyzing, and interpreting both quantitative and qualitative data but also integrating findings from the two kinds of data into a cohesive whole. Ivankova (2015) argues

### **3.6.1 Data collection process**

The qualitative research method is applied to conduct the in-depth and semi-structure interview to nine selected participants collect the relevant data for this research study. The data is collected from the questionnaires as guideline for the interview and the open-end questions can allow nine participants to provide additional inputs. The face-to-face in-depth interviews with the nine participants are taken place between 15 November 2019 to 25 January 2020. The quantitative research method is used to collect the quantitative data from the inputs of the nine participants in providing

answers of quantitative data includes the priority ranking using the Analytical Hierarchy Process (AHP) and the opinions using the Likert scale psychometric response, in which responders specify their level of agreement to a statement, which is applied in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree.

### **3.6.2 Measurements**

The questionnaires are used for a face-to-face in-depth interview with the nine participants as instruments of measurement as well as to take action steps of each action cycle of both phase one and phase two. The interview of each phase can be summarized as follows.

#### **The In-depth and semi-structured interview of nine participants of phase 1**

**The action step 2 of action cycle 1 of phase 1** aims to in-depth interview with nine participants to seek their opinions about initial potential CSFs of the Organisational Change Management. The questionnaires of this action step consist of 2 sections. section 1 consists of 8 demographic questions to ensure that nine participants are matched with the sampling criteria. Section 2 consists of 3 questions to refine the list of the initial potential CSFs of the Organisational Change Management (appendix B).

**The action step 2 of action cycle 2 of phase 1** aims to rank the final list of CSFs Taxonomy as well as to verify the reliability of the priority ranking of the CSFs Taxonomy and verify the reliability using the AHP. This step consists of 1 question to interview nine participants to rank the final list of CSFs using the statistical tool of the Analytic Hierarchy Process (AHP) through a priority scale from 1 to 9 (see table B4, appendix B) to pairwise to rank the Critical Success Factors (CSFs) through the interview of the nine participants to be classified into three classes (1) class A (most important CSFs), (2) Class B (second most important CSFs), and (3) class C (third most important CSFs). The AHP is also used to verify the reliability of the priority ranking of the CSFs Taxonomy.

**The action step 1 of action cycle 3 of phase 1** aims to in-depth interview with nine participants to seek for their inputs to validate the acceptability and usefulness of the final CSFs Taxonomy to the Organisational Change Management, which is developed at

action step 3 of the action cycle 1 of phase 1. The questionnaires consist of 5 questions of part A and 2 open-end questions of part B for additional comments from the participants, and the Likert scale psychometric response, in which responders specify their level of agreement to a statement, which is applied in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree; (appendix B).

**The action step 2 of action cycle 3 of phase 1** is to validate the contributions of the final CSFs Taxonomy to the Organisational Change Management. The questionnaires consist of 5 questions to interview with nine participants to provide their expertise to validate the contributions of the final CSFs Taxonomy to the Organisational Change Management, and the Likert scale psychometric response, in which responders specify their level of agreement to a statement, which is applied in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree; (appendix B).

**The action step 3 of action cycle 3 of phase 1** is to validate the contributions of the final CSFs Taxonomy to the Knowledge Management (KM). The in-depth interview is conducted with nine participants to provide their expertise to validate the contributions of the final CSFs Taxonomy to the Knowledge Management (KM). The in-depth interview consists of 5 questionnaires at this action step, and the Likert scale psychometric response, in which responders specify their level of agreement to a statement, which is applied in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree; (appendix B).

### **The In-depth and semi-structured interview of nine participants of phase 2**

**The action step 2 of action cycle 1 of phase 2** aims to aims to in-depth interview with nine participants to seek for their inputs for the current problems or issues as well as suggestions for the existing business processes of the new combined broadcasting and telecommunications licensing bureau of the NBTC. There are 2 questionnaires to in-depth interview with nine participants at this action step.

**The action step 2 of action cycle 2 of phase 2** aims to in-depth interview with nine participants to seek their opinions about initial potential KPIs of the Business Process

Management (BPM). The questionnaires of this action step consist of 2 questions to refine the list of the initial potential KPIs of the BPM (appendix B).

**The action step 2 of action cycle 3 of phase 2** aims to rank the final list of CSFs Taxonomy and verify the reliability using the AHP. This step consists of 1 question to interview nine participants to rank the final list of KPIs using the statistical tool of the Analytic Hierarchy Process (AHP) through a priority scale from 1 to 9 (see table B4, appendix B) to pairwise to rank the KPIs through the interview of the nine participants to be classified into three classes (1) class A (most important KPIs), (2) Class B (second most important KPIs), and (3) class C (third most important KPIs).

**The action step 1 of action cycle 4 of phase 2** aims to in-depth interview with nine participants to seek for their inputs to validate the acceptability and usefulness of the final KPIs Taxonomy of the BPM, which is developed at action step 3 of the action cycle 2 of phase 2. The questionnaires consist of 5 questions of part A and 2 open-end questions of part B for additional comments from the participants, and the Likert scale psychometric response, in which responders specify their level of agreement to a statement, which is applied in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree; (appendix B).

**The action step 2 of action cycle 4 of phase 2** is to validate the contributions of the final KPIs Taxonomy to the Organisational Change Management. The questionnaires consist of 5 questions to interview with nine participants to provide their expertise to validate the contributions of the final KPIs Taxonomy to the Organisational Change Management, and the Likert scale psychometric response, in which responders specify their level of agreement to a statement, which is applied in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree; (appendix B).

**The action step 3 of action cycle 4 of phase 2** is to validate the contributions of the final KPIs Taxonomy to the Knowledge Management (KM). The in-depth interview is conducted with nine participants to provide their expertise to validate the validate the contributions of the final KPIs Taxonomy to the Knowledge Management (KM). The in-depth interview consists of 5 questionnaires at this action step, and the Likert scale psychometric response, in which responders specify their level of agreement to a

statement, which is applied in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree; (appendix B).

### **3.7 Analysis of findings**

The qualitative analysis uses coding of the data analysis to develop the theme of the Critical Success Factors (CSFs) to be grouped based on the similar characteristics of each CSF. The coding of sub-theme is classified into different class based on the important level of each CSF as well as each KPI, which are class A, class B, and class C. The statistical analysis in this research study is applied Excel software to analyze the descriptive statistics, including mean and standard deviation. In addition, the Excel software is also applied to analyze the pairwise comparison as well as the consistency of the Analytic Hierarchy Process (AHP). Moreover, the participants' opinions are mainly used for the validation and the reliability of the results of this research study.

### **3.8 Validity and reliability**

#### **3.8.1 Validity**

This research study includes controls to the research data and research findings and has achieved the required research validity. The in-depth interview of the nine participants to seek their opinions and expertise are mainly applied to the validation of the acceptability and the usefulness of the research results of both Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management as well as Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM). In addition, the in-depth interviews of the nine participants is also applied to validate the contribution of both Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management as well as Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) to the relevant management concepts including Organisational Change Management and Knowledge Management (KM). The descriptive statistics includes the Likert scale psychometric response, in which responders specify their level of agreement to a statement, which is applied in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree of

the answers from the nine participants, and these are used to validate the results of the acceptability and the usefulness of the research results (appendix B).

### **3.8.2 Reliability**

The reliability of the research study results of both Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management as well as Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) are applied through the Analytic Hierarchy Process (AHP) to measure the overall consistency of the judgements by means of a consistency ratio. Saaty (2001) suggests that the value of the consistency ratio should be 10% or less (in fact 5% for a 3 by 3 matrix, 9% for a 4 by 4 matrix, and 10% for a larger matrix), a consistency ratio of less than 20% is considered acceptable, while a consistency ratio of less than 5% is perceived as a good consistency. In addition, the implementation index (IMPL) is also used to measure the reliability of the pairwise priority of the elements within both the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM). This IMPL is calculated by dividing standard deviation by the priority of that characteristic (Takala, 2002). The lower the index, the higher the reliability of the priority of that characteristic. According to Takala (2002), an IMPL of a value lower than 1 is considered very good, and 2 is acceptable. This reliability can also be validated by determining the slope of the relationship between IMPL and the priorities. A negative slope implies the reliability of the research study. In other words, an attribute with a high priority should have a low IMPL.

### **3.9 Ethics**

Plewa, et al. (2013) argue that a research study that interacts with a human being is very important in creating and nurturing sincerity, honesty, and trust. It is, therefore, necessary to open a two-way conversation to have a collaborative atmosphere in order to ensure that the participants are confident and trust both the researcher as well as the research process. Leedy and Ormrod (2019) argue that most ethical issues in research fall into one of four categories: protection from harm, voluntary and informed participants, right to privacy, and honesty with professional colleagues. This research proposal is submitted to the Ethics Committees of the University of Liverpool, and the conduct of this

research study and the research process follows strict ethical criteria in conducting the in-depth interview with the nine participants. The strict ethical criteria consist of four categories stated by Leedy and Ormrod (2019) include protection from harm, voluntary and informed participants, right to privacy, and honesty with professional colleagues.

The purpose of the research study, data collection methods, the voluntary nature of the participants, the benefits of the participation, the confidentiality of the information, and all data files are stored on a research computer and the security of the password and paper surveys are kept in a locked file cabinet. The results of the study are stored on a secured server at the University of Liverpool and are in the public domain for the benefit of the public. The participants' names are not identifiable from the research results as the data are anonymized, and the participants' names are not disclosed on the research paper. The participants are informed that they can withdraw their participation in the research study at any time, without any explanation. There is no negative consequences or disadvantages for refusing or withdrawing later.

In addition, there is a risk that this study might relate to the participants' opinions and that might be sensitive with regard to the government broadcasting and telecommunication laws and regulations. The researcher, however, is careful to consult with a lawyer as well as discuss with all of the nine participants to prevent any sensitive legal and regulation issues being given in the study reports. There is a risk of a conflict of interest between the researcher, who also has a role as the deputy general secretary of the Office of the National Broadcasting and Telecommunications Commission (NBTC), who supervises the senior executives of the NBTC bureaus and regulates both broadcasting and telecommunication operators. It is, therefore, possible that the participants might not provide free opinions if there are the issues of conflicts of interests. However, the researcher informs all nine participants that this research study is for study purpose only, and not for any purpose other than research nor for anything related to their organisational role, and their opinions do not impact their career advancement, or their businesses. The participants have freedom not to take part in this research study as well as to withdraw anytime, and there are no negative consequences and disadvantages. Therefore, their freedom of providing the truth of their opinions is very important and they are asked please do not worry about these issues.

### 3.10 Summary

In chapter three, the research context and design explain that the research study involve the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management , the new redesign of the business processes of the Business Process Management (BPM), and the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM). The CSFs Taxonomy of the Organisational Change Management enables the organisational change project to achieve the change vision, goals, and objectives. The Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) provides a management tool to monitor, evaluate, and take corrective action in respect of business process performance according to the measurement of the desirable targets of the Key Performance Indicators (KPIs). The research design applies the action research of the mixed research methodology and includes qualitative research, which seek answers to the research questions concerning the CSFs Taxonomy of the Organisational Change management, new redesign of the business processes and the KPIs Taxonomy of the BPM in the Disruptive Technology Convergence of Broadcasting and Telecommunications in the Governmental Regulatory Organisation. The qualitative research method is also conducted for this action research to gather opinion data from the in-depth interview of the nine participants. The quantitative and qualitative approaches are used through the Analytic Hierarchy Process (AHP), which incorporates both the quantitative and qualitative aspects of human thought for the priority ranking of the CSFs Taxonomy as well as KPIs Taxonomy. Moreover, the quantitative research method is used to collect the quantitative data from the inputs of the nine participants in providing answers of quantitative data includes the opinions using the Likert scale psychometric response, in which responders specify their level of agreement to a statement, which is applied in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree.

The statistical analysis in this research study is applied to statistical computer software to analyze the descriptive statistics including mean and standard deviation, and the opinions using the Likert scale psychometric response, in which responders specify their level of agreement to a statement, which is applied in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree. In addition, the statistical computer software is also applied to analyze the pairwise

comparison as well as the consistency of the Analytic Hierarchy Process (AHP). In addition, the in-depth interview of the nine participants to seek for inputs and opinions that are mainly used for the validation and reliability of the research results. The ethics procedure of this research study is strictly applied. The ethics proposal receives approval from the Ethics Committees of the University of Liverpool for conducting the research study and the research process strictly applied the ethical criteria approval to conduct an in-depth interview with the nine participants. The action research method of this chapter is applied for the story of cycles of action, reflection and sense -making in the next chapter four.

## **CHAPTER 4**

# **STORY OF CYCLES OF ACTION, REFLECTION, AND SENSE-MAKING**

The story of cycles of action, reflection, and sense-making chapter presents the outcome of the study in the step sequences conducted during the research, this proceeds in two phases; (1) development of the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the new combined broadcasting licensing bureau and telecommunication licensing bureau of the Office of the National Broadcasting and Telecommunications Commission (NBTC), and (2) development of the new redesign of the business processes of the Business Process Management (BPM), as well as the development of the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) of the new combined broadcasting and telecommunications licensing bureau of the Office of the National Broadcasting and Telecommunications Commission (NBTC). The detailed research outcome can be presented as follows.

### **4.1 Phase 1: The development of the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management**

Phase 1 consists of 3 action cycles, which two action cycles are conducted in chapter four and action cycle 3 is conducted in chapter five.

#### **4.1.1 Action cycle 1 of phase 1**

The action cycle 1 of phase 1 aims to develop the drafted Critical Success Factors (CSFs) of the Organisational Change Management of the newly combined broadcasting and telecommunications licensing bureau of the NBTC. This action cycle consists of 4 action steps, which the outcome can be summarized as follows.

**4.1.1.1 Action step 1 of action cycle 1 of phase 1:** Intensive literature review of the CSFs of the Organisational Change Management.

The intensive relevant literature about the Critical Success Factors (CSFs) is reviewed as already discussed in chapter 2, this includes, Fritzenschaft (2011); Isern, Meaney and Wilson (2009); Garvin and Roberto (2011) ; Morgan and Zeffane (2003); Stankovik, et al. (2013); Gerhardt, M., Frey, D., and Fisher, P. (2008); Chow and Cao (2008); and Farhan, et al. (2018). The initial CSFs of the Organisational Change Management from the literature review consists of 84 Critical Success Factors (CSFs). The initial potential 84 Critical Success Factors from the literature review are presented in table B1 (appendix B).

**Table B1** The initial potential Critical Success Factors (CSFs)

<b>Items</b>	<b>Initial Critical Success Factors (CSFs)</b>
1	Leadership Commitment and Support
2	Business Intelligence (BI) Technology
3	Skillful and Trained Staff
4	Organisational Culture
5	Customer Information Management
6	Customer Support and Service (CSS)
7	Employee Engagement
8	Monitoring, Controlling, and Correction
9	Knowledge Management (KM) Team
10	Change Vision and Mission
11	Organisational Infrastructure
12	CRM Software Selection
13	Interorganisational Integration
14	Customer Contact Management
15	Services Automation
16	Sales Automation
17	Customers/Consultant Involvement
18	Process Change
19	Customer Satisfaction
20	Marketing Automation
21	Time and Budget Management
22	Software Customization

**Table B1** The initial potential Critical Success Factors (CSFs), (cont.)

<b>Items</b>	<b>Initial Critical Success Factors (CSFs)</b>
23	Organisational Change Champion
24	CRM Champion
25	Shared Data Willingness
26	Customer Segmentation
27	Size of Organisation
28	Organisational Change Process
29	Procedures and Policy
30	Creation of Multidisciplinary Team
31	Understanding the Environment
32	Competences and Commitment
33	Human Resource Competency
34	Establishment of Confidence
35	Creation of a Shared Problem Awareness
36	Communication Technology
37	Change of Goals and Objectives
38	Resource Allocation (time, money, people)
39	Systematic Thinking Process
40	Sense of Organisational Change Urgency
41	Organisational Change Strategy
42	Quick Win Management
43	Monitoring and Making Adjustments
44	Setting up Objectives and Milestones of Activities
45	Setting up the Communication Message
46	Customer Relationship Management (CRM)
47	Provision of Training and Workshops
48	Consult Employee Representatives
49	Innovative Reward system
50	Continuous Improvement and Optimization
51	Shared Problem Awareness
52	Comprehensive Diagnosis

**Table B1** The initial potential Critical Success Factors (CSFs), (cont.)

<b>Items</b>	<b>Initial Critical Success Factors (CSFs)</b>
53	Management Coalition
54	Definition of Working Procedures
57	Licensing Approval and Renewal Process
58	Big Data Technology
59	Technology Evaluation and Control System
60	Digital Government Technology
61	Intergovernmental Integration Technology
62	Organisational Strategic Alignment
63	Cooperative Organisational Culture
64	Organisational Acceptance of New Technology
65	Hot Line System
66	Supporting Agile Working Environment
67	Business Process Management (BPM)
68	Human Capital Development
69	Artificial Intelligence (AI) Technology
70	Knowledgeable Management Team
71	Effective Management Style
72	Effective Self-Managing Teamwork
73	Performance and Reward Systems
74	Operational Change Strategy
75	Compliance with the Project Management Process
76	Compliance with the Configuration Management Process
77	Strong Communication of the Process Progress
78	Strong Customer Commitment
79	Well-Designed Simple Technical Standards
80	Following the Technical Design Standard
81	Right Amount of Documentation
82	Technical Training for Team Members
83	Organisational Structure
84	Project Management

**4.1.1.2 Action step 2 of action cycle 1 of phase 1:** In-depth and semi-structure interview of nine participants about initial potential of the CSFs of the Organisational Change Management.

The in-depth and semi-structure interview questions of nine participants of this action step consist of two sections as shows in appendix B.

**Section 1** consists of 8 demographic questions to ensure that nine participants are conformed with the sampling qualification criteria. The demographic data of nine participants is shown in table 4.1.

**Table 4.1** Demographic information of nine participants

Participant Number	Organisational Type	Number of Staffs	Years In Business	Career Title	Gender	Age (years)	Working Experience (Years)	Educational Background
1	Broadcasting Operator	2,000	31	Vice President	Male	59	30	Mass Communication Degree
2	Broadcasting Operator	1,800	35	General Manager	Male	56	29	Engineering and General Management Degree
3	Telecommunications Operator	3,000	32	Vice President	Male	57	31	Telecommunications Engineering Degree
4	Telecommunications Operator	4,000	35	Chief Operating Officer	Male	58	34	Electrical Engineering Degree
5	University	2,500	42	Senior Researcher	Female	59	36	Economics Degree
6	Governmental Regulator	1,500	137	Director	Male	53	30	Telecommunications Engineering Degree
7	Governmental Regulator	1,500	137	Deputy Secretary General	Male	57	30	Computer Engineering Degree
8	Governmental Regulator	1,500	137	Director	Female	55	35	Mass Communication Degree
9	Governmental Regulator	1,500	137	Director	Male	52	32	Economics Degree

The research study gathers demographic questions to interview the nine participants and to verify their qualifications in conformity with the required qualification, this can be summarized as follows.

(1) Senior executives, directors, and academic researchers who have experience of least 20 years in broadcasting and telecommunication industries, as this research study requires their judgement and consideration of organisational change management, for which the judgement and consideration requires experience of senior executives, directors and academic researchers who have considerable experience in broadcasting and telecommunication industries (at least 20 year experience in broadcasting and telecommunication industries).

(2) Senior executives, directors, and academic researchers who are involved in organisational change management, as they have direct experience and have played leadership roles in organisational change management and can provide direct input and contributions in respect of organisational change management.

From table 4.1, the results of the demographic interview of the qualifications of the nine participants show that participant number 1 is a vice president of a broadcasting operator, with 30 years working experience in the broadcasting industry, and a mass communication degree, with experience in an organisational change management project. Participant number 2 is a general manager of a broadcasting operator, with 29 years working experience in the broadcasting industry, and both engineering and general management degrees, and has direct experience in an organisational change management project. Participant number 3 is a vice president of a telecommunications operator, with 31 years of working experience in the telecommunication industry, with a telecommunication engineering degree, and has direct experience in an organisational change management project. Participant number 4 is a chief operating officer of a telecommunications operator, with 34 years of working experience in the telecommunication industry, and an electrical engineering degree, with direct experience in an organisational change management project. Participant number 5 is a senior researcher of a university, with 36 years of research experience in the broadcasting and telecommunications industry, an economics degree, and has direct experience in research of an organisational change management project. Participant number 6 is a director of the governmental regulator

of broadcasting and telecommunications, with 30 years of working experience in the broadcasting and telecommunications industry, a telecommunication engineering degree, and has direct experience in an organisational change management project. Participant number 7 is a deputy secretary general of the governmental regulator of the broadcasting and telecommunications, with 30 years of working experience in the broadcasting and telecommunications industry, a computer engineering degree, and has direct experience in an organisational change management project. Participant number 8 is a director of the governmental regulator of the broadcasting and telecommunications, with 35 years of working experience in the broadcasting and telecommunication industry, a mass communications degree, and has direct experience in an organisational change management project. Participant number 9 is a director of the governmental regulator of the broadcasting and telecommunications, with 32 years of working experience in the broadcasting and telecommunications industry, an economics degree, and has direct experience in an organisational change management project.

In conclusion, the interview of the qualifications of the nine participants it is found that all nine participants are qualified according to the required qualifications.

**Section 2:** The Refinement of the Initial Potential Critical Success Factors (CSFs) of the Organisational Change Management.

This section 2 aims to refine the list of the initial potential CSFs of the Organisational Change Management from the literature review as well as the inputs from the in-depth interview of nine participants. The in-depth interview consists of 3 questions (appendix B), which the inputs of nine participants can be summarized as follows.

1. Do you think that the initial list of the potential CSFs of the Organisational Change Management that is developed from the intensive relevant literature review is acceptable and relevant to the CSFs of the Organisational Change Management of the NBTC (please see table B1) ?

The overall inputs of nine participants accept that the initial list of the potential CSFs of the Organisational Change Management is relevant to the CSFs of the Organisational Change Management of the NBTC, which shows in table 4.2.

**Table 4.2** The inputs of nine participants to the initial list of the potential CSFs of the Organisational Change Management

Participants	Do you think that the initial list of the potential CSFs of the Organisational Change Management that is developed from the intensive relevant literature review is acceptable and relevant to the CSFs of the Organisational Change Management of the NBTC?
1	“The initial list of the potential CSFs of the Organisational Change Management is acceptable and relevant to the CSFs of the organisational Change Management of the NBTC”
2	“I believe that it is acceptable and relevant”
3	“The overall of the CSFs is acceptable and relevant”
4	“Acceptable and relevant”
5	“I agree with the initial list CSFs that is acceptable and relevant to the CSFs of the Organisational Change Management of the NBTC”
6	“The initial list looks good, and I think that it is acceptable and relevant to the CSFs of the organisational Change Management of the NBTC”
7	“I agree that the initial list of the potential CSFs is acceptable and relevant”
8	“The initial list of the CSFs is acceptable and reliable to the CSFs of the Organisational Change Management of the NBTC”
9	“I totally agree that the initial list of the CSFs is acceptable and relevant”

2. Please provide additional comments or suggestions about the initial list of the potential CSFs that you might have.

**Table 4.3** The inputs of nine participants to the initial list of the potential CSFs of the Organisational Change Management

Participants	Please provide additional comments or suggestions about the initial list of the potential CSFs that you might have.
1	"I have no additional comments or suggestions"
2	"The initial list of the potential CSFs is 84 CSFs; I think that it is too high and difficult to further analyse"
3	"I have no additional comments or suggestions"
4	"The high number of 84 CSFs might be very difficult to select the highest potential CSFs of the Organisational Change Management"
5	"The potential list of CSFs should be shortened and to remove the duplication of the CSFs"
6	"The 84 potential CSFs is too high, and it should be reduced to maintain only the high CSFs"
7	"I have no additional comments or suggestions"
8	"I have no additional comments or suggestions"
9	"I think that the 84 CSFs is too high, and it should be selected only the most relevant and important CSFs"

The inputs from nine participants in table 4.3 shows that the participant number 1, number 3, number 7, and number 8 have no additional comments or suggestions. However, the participant number 2, number, 4, number 5, number 6, and number 9 suggest that 84 CSFs of the initial list are too high, and the only highly important CSFs should be selected to further develop the CSFs Taxonomy.

3. Please provide the level of the importance of the initial CSFs in table B2 (appendix B) of the scale of low, medium, and high.

The 84 initial potential Critical Success Factors (CSFs) that are collected in table B2 are refined to further develop the most important Critical Success Factors (CSFs) by interviews with the nine participants to verify the most important (high level of importance) of the Critical Success Factors (CSFs) of the Organisational Change Management. The 84 initial Critical Success Factors (CSFs) are thus refined by ranking the most important Critical Success Factors (CSFs) using a scale from high, medium and low. The high ranking is refined into 36 Critical Success Factors (CSFs) through the validation of the in-depth interview of the nine participants as shows in table 4.4. These nine participants also recommend using a validation process to categorize the Critical Success Factors (CSFs) into 4 categories so as to be more systematic include 1) Organisational Critical Success Factors (CSFs), 2) Human Capital Critical Success Factors (CSFs), 3) Operations Critical Success Factors (CSFs) and 4) Technology Critical Success Factors (CSFs). The drafted Critical Success Factors (CSFs) Taxonomy of the Organisational Change is be presented in table 4.5. I agree to categorize the initial potential CSFs into 4 categorized CSFs because the common CSFs should be grouped into the same category, which can make it more systematic and be more effective to analyse each category as well as the linkage among 4 categories. According to Stankovik, et al. (2013) argue that CSFs for implementing the Organisational Change Management can be classified into 5 categories 1) organisational factors, 2) people factors, 3) process factors, 4) technical factors, and 5) project factors. However, Farhan, et al. (2018) argue that the CSFs of the Organisational Change Management can be classified in 4 categories 1) organisational factors, 2) technological factors, 3) process factors, and 4) project factors. Stankovik, et al. (2013) agree that there are similar CSFs of the Organisational Change Management as Farhan, et al. (2018) and include organisational factors,

process factors, technology factors and project factors. However, Stankovik, et al. (2013) argue that people factors are also CSFs, but Farhan (2018) does not specify as the CSFs of the organisational change management. I think that the categorized CSFs from the inputs of the in-depth interview of nine participants are the same direction as the relevant literature review.











**4.1.1.3 Action step 3 of action cycle 1 of phase 1: Develop the first drafted CSFs Taxonomy of the Organisational Change Management:** This step is to adjust the proposed initial potential CSFs from the intensive literature review with the inputs from the interview of nine participants. The first drafted CSFs Taxonomy of the Organisational Change Management is further developed from the action step 2 of action cycle of phase as shows in table 4.5.

**Table 4.5** First drafted Critical Success Factors (CSFs) Taxonomy of Organisational Change Management from the nine participants' interview

<b>Performance Focused Areas</b>	<b>Critical Success Factors (CSFs)</b>
<b>Organisational Change Management</b>	CSF 01. Change Vision and Mission
	CSF 02. Change Goals and Objectives
	CSF 03. Organisational Change Strategy
	CSF 04. Organisational Infrastructure
	CSF 05. Performance and Reward Systems
	CSF 06. Organisational Structure
	CSF 07. Organisational Culture
	CSF 08. Resource Allocation
	CSF 09. Interorganisational Integration
	CSF 13. Employee Engagement
	CSF 14. Effective Self-Managing Teamwork
	CSF 15. Knowledge Management (KM) Team
	CSF 16. Quick Win Management
	CSF 17. Organisational Change Champion
	CSF 18. Sense of Organisational Change Urgency
	CSF 19. Operational Change Strategy
	CSF 20. Organisational Change Process
	CSF 21. Business Process Management (BPM)
	CSF 22. Customer Relationship Management (CRM)
	CSF 23. Organisational Strategic Alignment
	CSF 24. Licensing Approval and Renewal Process

**Table 4.5** First drafted Critical Success Factors (CSFs) Taxonomy of Organisational Change Management from the nine participants' interview (cont.)

Performance Focused Areas	Critical Success Factors (CSFs)
<b>Organisational Change Management</b>	CSF 23. Organisational Strategic Alignment CSF 24. Licensing Approval and Renewal Process CSF 25. Hot Line System CSF 26. Project Management CSF 27. Continuous Improvement and Optimization CSF 28. Big Data Technology CSF 29. Business Intelligence (BI) Technology CSF 30. Digital Government Technology CSF 31. Customer Support and Service (CSS) CSF 32. Artificial Intelligence (AI) Technology CSF 33. Technology Evaluation and Control System CSF 34. Intergovernmental Integration Technology CSF 35. Customer Engagement Technology CSF 36. Communication Technology

**4.1.1.4 Action step 4 of action cycle 1 of phase 1: Reflection and sense making of action cycle 1 of phase 1:** This step is to reflect as well as sense making of the action cycle 1 of phase 1.

The nine participants provide the level of the importance for 84 initial potential CSFs of the Organisational Change Management shows in table 4.4. I find that some CSFs are considered as low, medium, and high from the inputs of nine participants. However, I think the most important CSFs should be considered as high level of the importance from all nine participants, which are 36 CSFs that shows in table 4.4. Therefore, I select only these 36 CSFs as the for the first drafted CSFs Taxonomy as shows in table 4.5, which are used to develop the second drafted CSFs Taxonomy of the Organisational Change Management in the next action cycle.

#### **Action cycle 2 of phase 1**

The action cycle 2 of phase 1 focusses on developing the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the newly combined broadcasting and communications licensing bureau of the NBTC. This

action cycle consists of 4 action steps and can be developed the research outcome as follows.

**4.1.2.1 Action step 1 of action cycle 2 of phase 1: Refine the first drafted and develop of the second drafted CSFs Taxonomy of the Organisational Change Management:** The first drafted CSFs Taxonomy of the Organisational Change Management is refined from action cycle 1 of phase 1 to be developed as the second drafted CSFs Taxonomy. In developing the second drafted CSFs Taxonomy, the CSFs from table 4.5 are grouped systematically into four categories include 1) organisational factors, 2) human capital factors, 3) operations factors, and 4) technological factors. Each categorized factor consists of 9 CSFs, which is shown in table 4.6.

**Table 4.6** Second drafted Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management

<b>Categorized Factors</b>	<b>Critical Success Factors (CSFs)</b>
<b>1. Organisational Factors</b>	CSF 01. Change Vision and Mission CSF 02. Change Goals and Objectives CSF 03. Organisational Change Strategy CSF 04. Organisational Infrastructure CSF 05. Performance and Reward Systems CSF 06. Organisational Structure CSF 07. Organisational Culture CSF 08. Resource Allocation CSF 09. Interorganisational Integration
<b>2. Human Capital Factors</b>	CSF 10. Leadership Commitment and Support CSF 11. Human Resource Competency CSF 12. Human Capital Development CSF 13. Employee Engagement CSF 14. Effective Self-Managing Teamwork CSF 15. Knowledge Management (KM) Team

**Table 4.6** Second drafted Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management (cont.)

<b>Group Factors</b>	<b>Critical Success Factors (CSFs)</b>
<b>2. Human Capital Factors</b>	CSF 16. Quick Win Management CSF 17. Organisational Change Champion CSF 18. Sense of Organisational Change Urgency
<b>3. Operations Factors</b>	CSF 19. Operational Change Strategy CSF 20. Organisational Change Process CSF 21. Business Process Management (BPM) CSF 22. Customer Relationship Management (CRM) CSF 23. Organisational Strategic Alignment CSF 24. Licensing Approval and Renewal Process CSF 25. Hot Line System CSF 26. Project Management CSF 27. Continuous Improvement and Optimization
<b>4. Technology Factors</b>	CSF 28. Big Data Technology CSF 29. Business Intelligence (BI) Technology CSF 30. Digital Government Technology CSF 31. Customer Support and Service (CSS) CSF 32. Artificial Intelligence (AI) Technology CSF 33. Technology Evaluation and Control System CSF 34. Intergovernmental Integration Technology CSF 35. Customer Engagement Technology CSF 36. Communication Technology

**4.1.2.2 Action step 2: Rank the list of the second drafted CSFs Taxonomy and verify the reliability using AHP:** This step consists of two parts. Part 1 is the semi-structured interview process of having nine participants to rank the list of the second drafted CSFs and Part 2 aims to verify the reliability, which both parts are applied the statistical tool of the Analytic Hierarchy Process (AHP) through a priority scale from 1 to 9 (see table B4, appendix B) to pairwise to rank the Critical Success Factors (CSFs) through the interview of the nine participants to be classified into three classes (1) class A (the most important CSFs), (2) Class B (second most important CSFs), and (3) class C (third most important CSFs).

**Table B4 (from appendix B)** Pairwise comparison scale for Analytic Hierarchy Process (AHP)

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Moderate importance	Experience and judgment slightly favour one activity over another
5	Strong importance	Experience and judgment strongly favour one activity over another
7	Very strong or demonstrated importance	An activity is favoured very strongly over another; and its dominance demonstrated in practice
9	Extreme importance	The evidence favouring one activity over another is of the highest possible order of affirmation
2,4,6,8	For compromise between the above values	Sometimes one needs to interpolate a compromise judgment numerically because there is no proper word to describe it

Source: Saaty, T.L., 2001, Decision Making for Leaders, RWS Publication, Pittsburgh

#### **4.1.2.2.1 Organisational Critical Success Factors (CSFs) of the Organisational Change Management**

The second draft Organisational Critical Success Factors (CSFs) of the Organisational Change Management is further developed through the semi-structured interview of the nine participants using the Analytical Hierarchy Process (AHP). The interview of the nine participants to pairwise the Organisational Critical Success Factors (CSFs) from table B5 (appendix B) to classify into three classes of CSFs, these are 1) Class A (most important) of the Critical Success Factors (CSFs), 2) Class B (second most important) of the Critical Success Factors (CSFs) and 3) Class C (third most important) of the Critical Success Factors (CSFs).

The nine participants rank the pairwise comparison of the Organisational Critical Success Factors (CSFs), in table B5 (appendix B), to compare the priority or the critical nature of each pair of two Critical Success Factors (CSFs) using the pairwise comparison scale of Analytical Hierarchy Process (AHP) from table B4 (appendix B), in order to weigh the priority or critical nature, and then use Microsoft Excel computer software to analyze the pairwise results, which can be presented in table 4.16, table 4.18 and figure 4.10 as follows.

The pairwise results show that the rank of the Organisational Critical Success Factors (CSFs) can be grouped into three classes, in which Class A (most important) consists of CSF1 (Change Vision and Mission), CSF7 (Organisational Culture), and CSF3 (Organisational Change Strategy). Class B (second most important) consists of CSF4 (Organisational Infrastructure), CSF2 (Change Goals and Objectives), and CSF3 (Organisational Change Strategy), and Class C (third most important) consists of CSF9 (Interorganisational Integration), CSF5 (Performance and Reward System), and CSF6 (Organisational Structure) respectively.

#### **The verification of the reliability of the priority ranking of each Organisational Critical Success Factor (CSFs) Taxonomy**

Takala (2002) argues that the implementation index (IMPL) should be applied to measure the reliability of the priority ranking of the characteristics, which can be calculated by dividing the standard deviation by the priority ranking of the

characteristic. The lower the IMPL index is, the higher the reliability of the priority ranking of the characteristic. The IMPL index of a value lower than 1.0 is considered as a very acceptable level, and that between 1.0 and 2.0 is considered as an acceptable level. The reliability is also able to be validated by determining the slope of the relationship between IMPL index and the priority ranking. A negative slope is considered that the result is reliable.

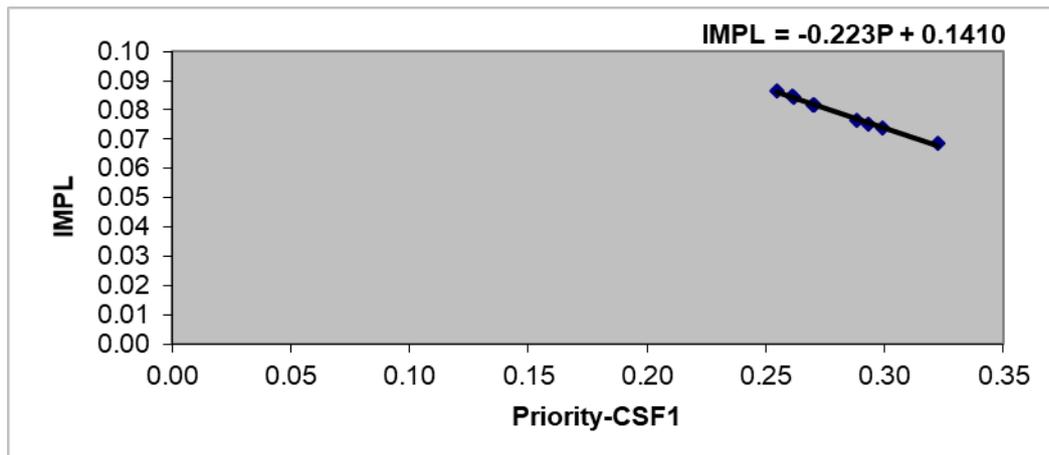
The reliability of the priority ranking of CSF1 (Change Vision and Mission) was measured through the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF1 (Change Vision and Mission), as presented in table 4.7.

**Table 4.7** Implementation Index & Standard deviation (Criteria for Evaluation)  
CSF1 (Change Vision and Mission)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.26	0.02	0.08
Participant no.2	0.32	0.02	0.07
Participant no.3	0.30	0.02	0.07
Participant no.4	0.27	0.02	0.08
Participant no.5	0.29	0.02	0.08
Participant no.6	0.25	0.02	0.09
Participant no.7	0.27	0.02	0.08
Participant no.8	0.29	0.02	0.08
Participant no.9	0.26	0.02	0.08
Overall Mean	0.28		
Std Deviation	0.02		
Coefficient of variation	8%		
Geometric Mean Priorities	0.28	0.02	0.08
IMPL	0.08		

The result of the implementation index (IMPL) of CSF1 (Change Vision and Mission) from table 4.7 is 0.08, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.1 shows that the slope between the implementation index (IMPL) and the CSF1 priority is negative (-0.223), and it can be considered that the relationship is very reliable.



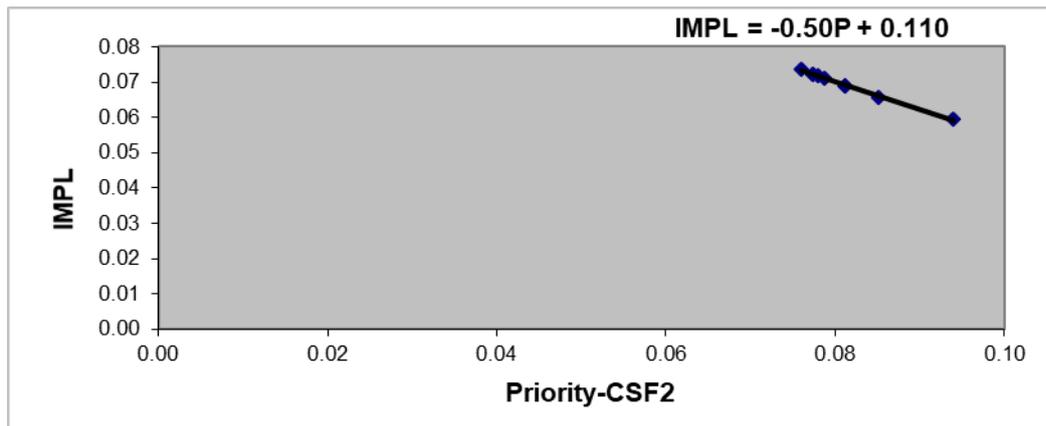
**Figure 4.1** Priority-CSF1 and implementation index (IMPL) relationship

**Table 4.8** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF2 (Change Goals and Objectives)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.08	0.01	0.07
Participant no.2	0.08	0.01	0.07
Participant no.3	0.08	0.01	0.07
Participant no.4	0.08	0.01	0.07
Participant no.5	0.08	0.01	0.07
Participant no.6	0.09	0.01	0.07
Participant no.7	0.08	0.01	0.07
Participant no.8	0.09	0.01	0.06
Participant no.9	0.08	0.01	0.07
Overall Mean	0.08		
Std Deviation	0.01		
Coefficient of variation	7%		
Geometric Mean Priorities	0.08	0.01	0.07
IMPL	0.07		

The result of the implementation index (IMPL) of CSF2 (Change Goals and Objectives) from table 4.8 is 0.07 which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.2 shows that the slope between the implementation index (IMPL) and the CSF2 priority is negative (-0.50), and it can be considered that the relationship is very reliable.



**Figure 4.2** Priority-CSF2 and implementation index (IMPL) relationship

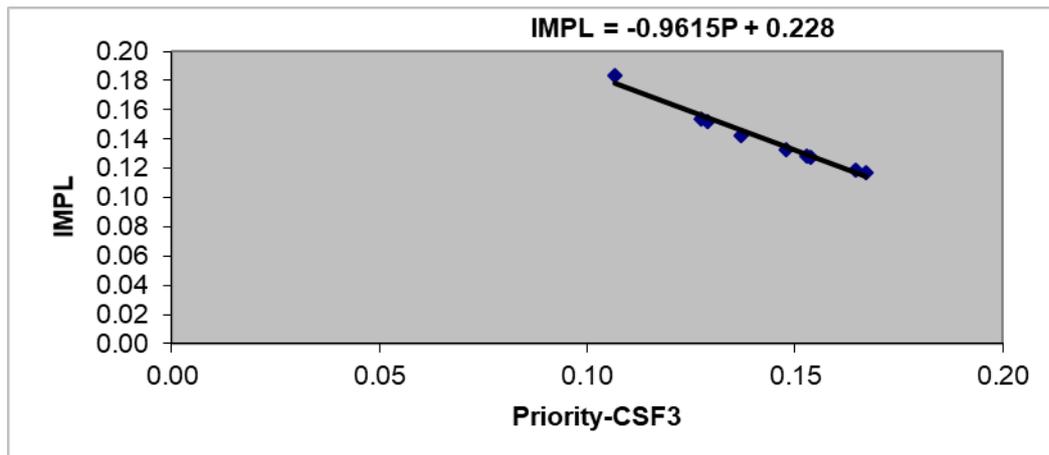
**Table 4.9** Implementation Index & Standard Deviation (Criteria for Evaluation)

CSF3 (Organisational Change Strategy)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.15	0.02	0.13
Participant no.2	0.13	0.02	0.15
Participant no.3	0.13	0.02	0.15
Participant no.4	0.11	0.02	0.18
Participant no.5	0.14	0.02	0.14
Participant no.6	0.17	0.02	0.12
Participant no.7	0.16	0.02	0.12
Participant no.8	0.15	0.02	0.13
Participant no.9	0.15	0.02	0.13
Overall Mean	0.14		
Std Deviation	0.02		
Coefficient of variation	14%		
Geometric Mean Priorities	0.15	0.02	0.13
IMPL	0.13		

The result of the implementation index (IMPL) of CSF3 (Organisational Change Strategy) from table 4.9 is 0.13, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.3 shows that the slope between the implementation index (IMPL) and the CSF3 priority is negative (-0.9615), and it can be considered that the relationship is very reliable.



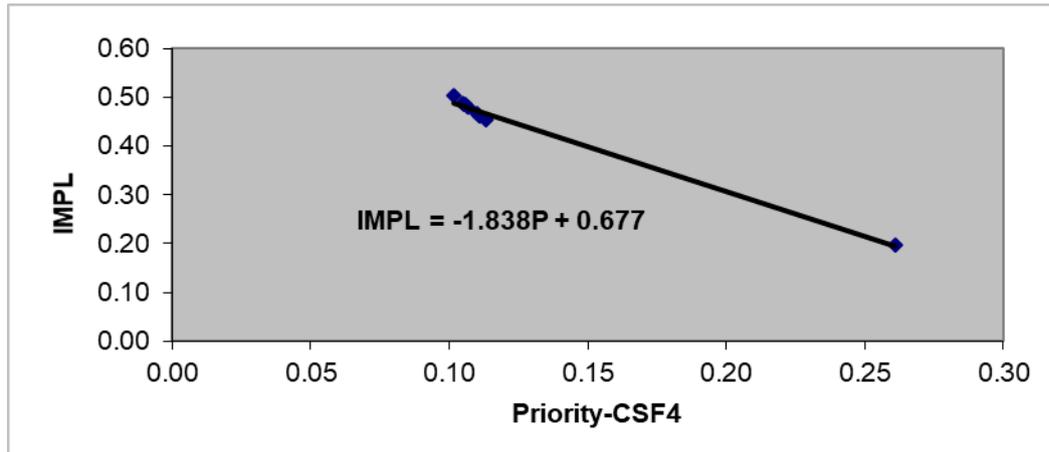
**Figure 4.3** Priority-CSF3 and implementation index (IMPL) relationship

**Table 4.10** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF4 (Organisational Infrastructure)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.26	0.05	0.20
Participant no.2	0.11	0.05	0.45
Participant no.3	0.11	0.05	0.49
Participant no.4	0.11	0.05	0.48
Participant no.5	0.11	0.05	0.47
Participant no.6	0.11	0.05	0.46
Participant no.7	0.11	0.05	0.49
Participant no.8	0.11	0.05	0.48
Participant no.9	0.10	0.05	0.50
Overall Mean	0.12		
Std Deviation	0.05		
Coefficient of variation	41%		
Geometric Mean Priorities	0.11	0.05	0.47
IMPL	0.47		

The result of the implementation index (IMPL) of CSF4 (Organisational Infrastructure) from table 4.10 is 0.47, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.4 shows that the slope between the implementation index (IMPL) and the CSF4 priority is negative (-1.838), and it can be considered that the relationship is very reliable.



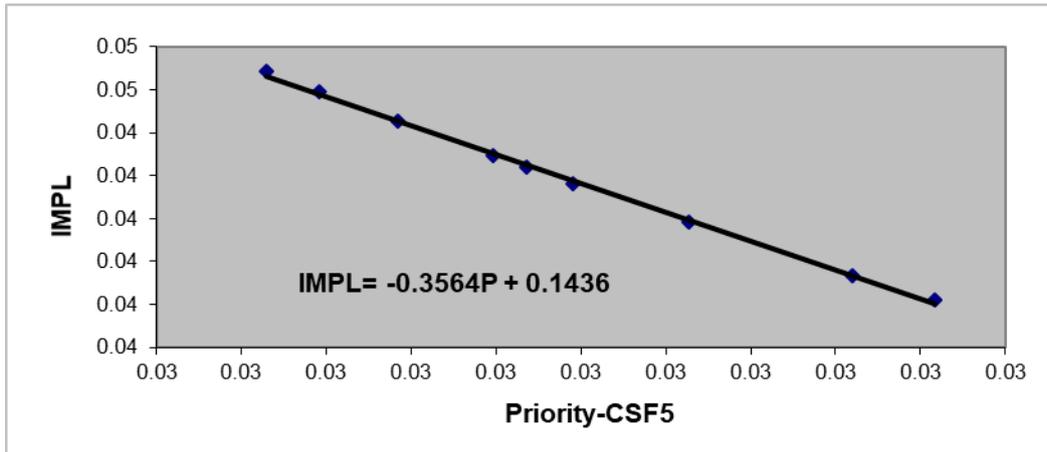
**Figure 4.4** Priority-CSF4 and implementation index (IMPL) relationship

**Table 4.11** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF5 (Performance and Reward System)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.03	0.0013	0.04
Participant no.2	0.03	0.0013	0.04
Participant no.3	0.03	0.0013	0.04
Participant no.4	0.03	0.0013	0.05
Participant no.5	0.03	0.0013	0.04
Participant no.6	0.03	0.0013	0.04
Participant no.7	0.03	0.0013	0.04
Participant no.8	0.03	0.0013	0.04
Participant no.9	0.03	0.0013	0.04
Overall Mean	0.03		
Std Deviation	0.00		
Coefficient of variation	4%		
Geometric Mean Priorities	0.03	0.0013	0.04
IMPL	0.04		

The result of the implementation index (IMPL) of CSF5 (Performance and Reward System) from table 4.11 is 0.04, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.5 shows that the slope between the implementation index (IMPL) and the CSF5 priority is negative (-3.564), and it can be considered that the relationship is very reliable.



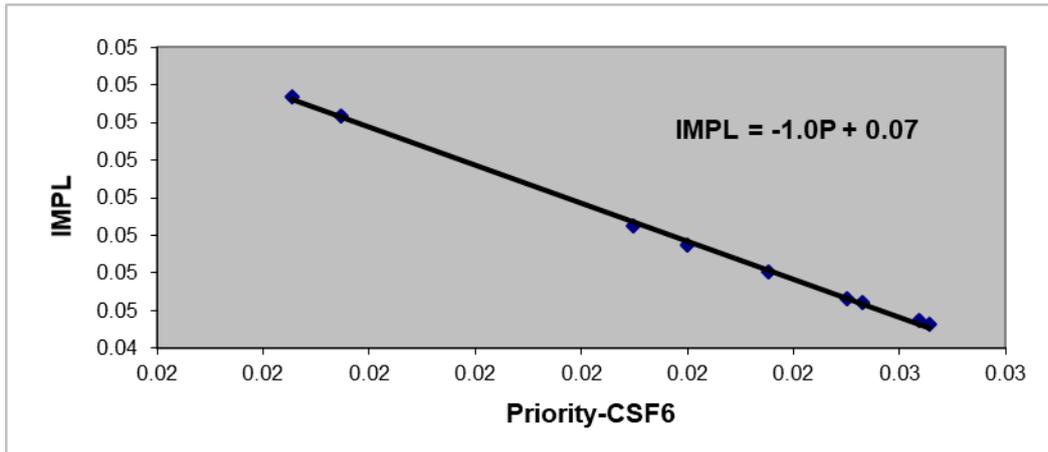
**Figure 4.5** Priority-CSF5 and implementation index (IMPL) relationship

**Table 4.12** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF6 (Organisational Structure)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.02	0.0011	0.05
Participant no.2	0.02	0.0011	0.05
Participant no.3	0.03	0.0011	0.04
Participant no.4	0.02	0.0011	0.05
Participant no.5	0.02	0.0011	0.05
Participant no.6	0.03	0.0011	0.04
Participant no.7	0.02	0.0011	0.05
Participant no.8	0.02	0.0011	0.05
Participant no.9	0.02	0.0011	0.05
Overall Mean	0.02		
Std Deviation	0.00		
Coefficient of variation	5%		
Geometric Mean Priorities	0.02	0.0011	0.05
IMPL	0.05		

The result of the implementation index (IMPL) of CSF6 (Organisational Structure) from table 4.12 is 0.05, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.6 shows that the slope between the implementation index (IMPL) and the CSF6 priority is negative (-1.00), and it can be considered that the relationship is very reliable.



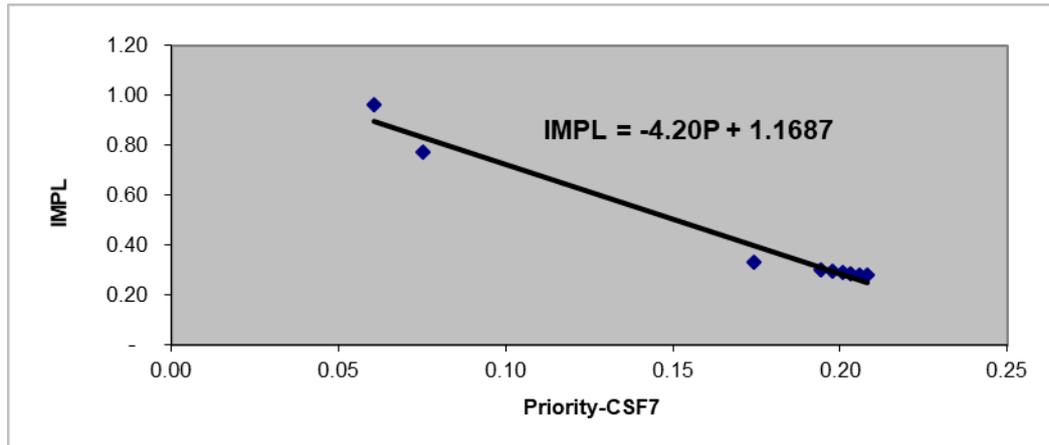
**Figure 4.6** Priority-CSF6 and implementation index (IMPL) relationship

**Table 4.13** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF7 (Organisational Culture)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.21	0.06	0.28
Participant no.2	0.17	0.06	0.33
Participant no.3	0.21	0.06	0.28
Participant no.4	0.20	0.06	0.29
Participant no.5	0.20	0.06	0.29
Participant no.6	0.19	0.06	0.30
Participant no.7	0.20	0.06	0.29
Participant no.8	0.06	0.06	0.96
Participant no.9	0.08	0.06	0.78
Overall Mean	0.17		
Std Deviation	0.06		
Coefficient of variation	35%		
Geometric Mean Priorities	0.19	0.06	0.30
IMPL	0.30		

The result of the implementation index (IMPL) of CSF7 (Organisational Culture) from table 4.13 is 0.30, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.7 shows that the slope between the implementation index (IMPL) and the CSF7 priority is negative (-4.20), and it can be considered that the relationship is very reliable.



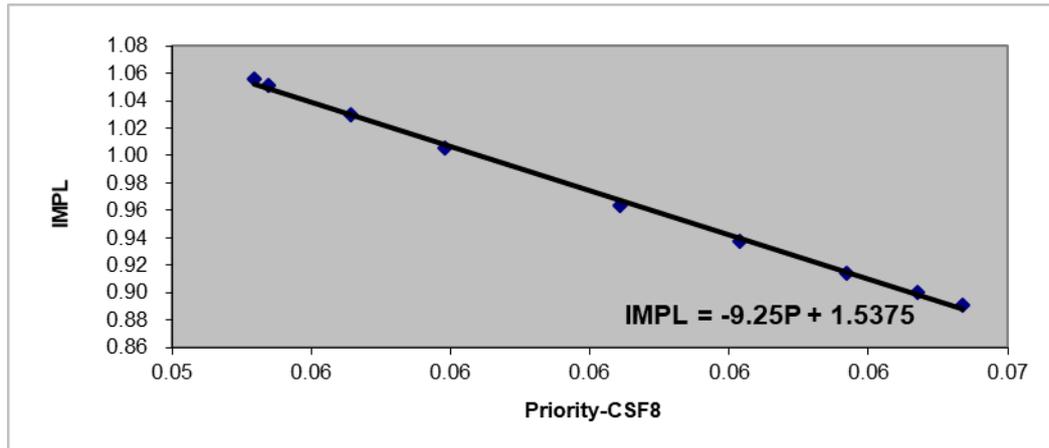
**Figure 4.7** Priority-CSF7 and implementation index (IMPL) relationship

**Table 4.14** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF8 (Resource Allocation)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.06	0.06	1.01
Participant no.2	0.06	0.06	0.90
Participant no.3	0.06	0.06	1.03
Participant no.4	0.06	0.06	1.05
Participant no.5	0.06	0.06	0.94
Participant no.6	0.07	0.06	0.89
Participant no.7	0.06	0.06	1.06
Participant no.8	0.06	0.06	0.96
Participant no.9	0.06	0.06	0.91
Overall Mean	0.06		
Std Deviation	0.004		
Coefficient of variation	7%		
Geometric Mean Priorities	0.06	0.06	0.97
IMPL	0.07		

The result of the implementation index (IMPL) of CSF8 (Resource Allocation) from table 4.14 is 0.07, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.8 shows that the slope between the implementation index (IMPL) and the CSF8 priority is negative (-9.25), and it can be considered that the relationship is very reliable.



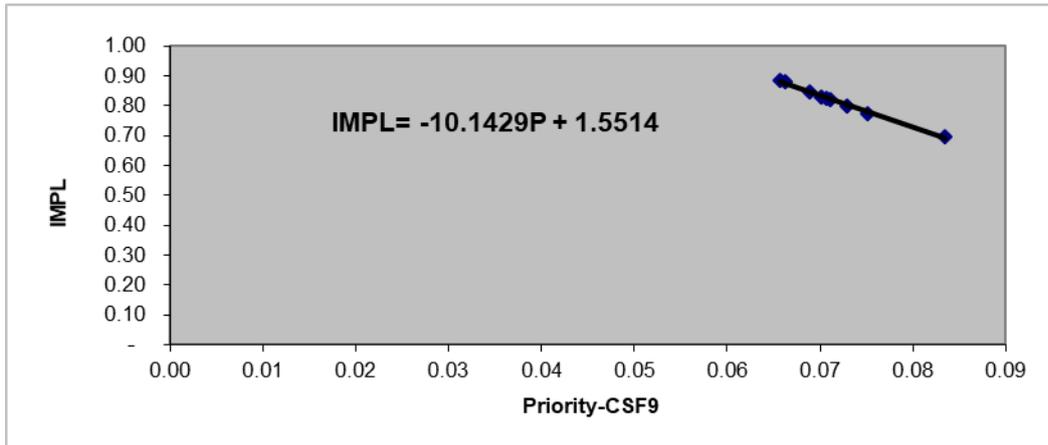
**Figure 4.8** Priority-CSF8 and implementation index (IMPL) relationship

**Table 4.15** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF9 (Interorganisational Integration)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.07	0.06	0.80
Participant no.2	0.07	0.06	0.89
Participant no.3	0.07	0.06	0.82
Participant no.4	0.07	0.06	0.85
Participant no.5	0.07	0.06	0.82
Participant no.6	0.07	0.06	0.88
Participant no.7	0.07	0.06	0.83
Participant no.8	0.08	0.06	0.70
Participant no.9	0.08	0.06	0.78
Overall Mean	0.07		
Std Deviation	0.01		
Coefficient of variation	7%		
Geometric Mean Priorities	0.07	0.06	0.81
IMPL	0.07		

The result of the implementation index (IMPL) of CSF9 (Interorganisational Integration) from table 4.15 is 0.07, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.9 shows that the slope between the implementation index (IMPL) and the CSF9 priority is negative (-10.1429), and it can be considered that the relationship is very reliable.



**Figure 4.9** Priority-CSF9 and implementation index (IMPL) relationship

The summary of all 9 participants' pairwise approach evaluation hierarchy was calculated using the Analytical Hierarchy Process (AHP) to seek the overall evaluation of the priority ranking and the reliability of the results. The results can be presented as follows.

**Table 4.16** Summary of Approach Evaluation Hierarchy of Nine Participants of the Organisational Critical Success Factors (CSFs)**Normalized Matrix - Approximate Method**

Organisational CSFs	1	2	3	4	5	6	7	8	9	Row Sum	Avg Row Sum	Ranking
1	243/790	136/44 1	97/284	103/31 4	167/6 93	197/ 883	21/92	53/17 6	84/337	2.53	0.28	1
2	71/933	28/367	12/163	28/291	53/51 2	99/9 53	29/60 5	47/74 9	42/463	0.73	0.08	5
3	61/460	103/67 5	139/94 4	14/99	89/54 6	51/3 17	72/61 1	37/24 3	40/243	1.33	0.15	3
4	42/431	37/449	91/841	53/510	52/38 9	109/ 813	49/63 1	61/56 7	19/148	0.97	0.11	4
5	9/211	5/203	8/265	2/77	13/38 9	1/32	9/368	7/241	16/369	0.29	0.03	8
6	20/541	9/457	4/163	9/433	21/73 3	17/6 34	19/89 1	16/85 3	4/193	0.22	0.02	9
7	56/289	187/81 7	23/128	173/89 9	157/7 99	49/2 71	131/9 11	163/7 39	190/90 9	1.75	0.19	2
8	20/337	32/453	5/89	11/196	26/38 9	25/3 01	5/132	33/56 8	35/692	0.54	0.06	7
9	29/542	19/521	37/954	2/57	13/38 9	23/4 10	71/23 6	38/76 3	16/369	0.65	0.07	6

**Table 4.17** Implementation Index & Standard Deviation of Organisational Critical Success Factors (CSFs) of the Organisational Change Management (9 participants)

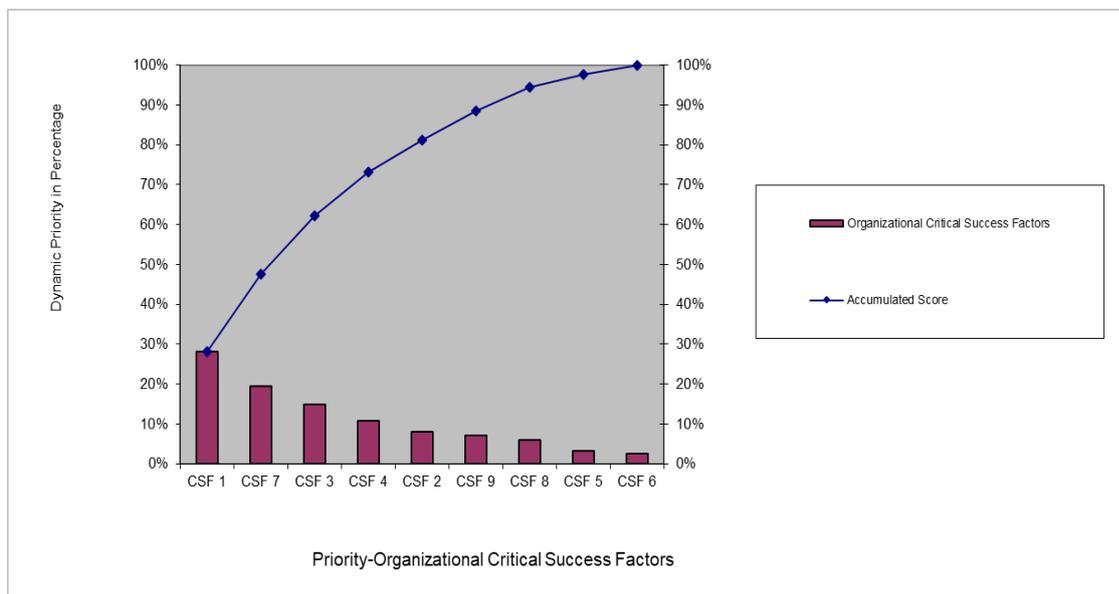
Participants	CSF1	CSF2	CSF3	CSF4	CSF5	CSF6	CSF7	CSF8	CSF9
Participant no.1	0.26	0.08	0.15	0.11	0.03	0.02	0.21	0.06	0.07
Participant no.2	0.32	0.08	0.13	0.11	0.03	0.02	0.17	0.06	0.07
Participant no.3	0.30	0.08	0.13	0.11	0.03	0.03	0.21	0.06	0.07
Participant no.4	0.27	0.08	0.17	0.11	0.03	0.02	0.20	0.06	0.07
Participant no.5	0.29	0.08	0.14	0.11	0.03	0.02	0.20	0.06	0.07
Participant no.6	0.25	0.09	0.17	0.11	0.03	0.03	0.19	0.07	0.07
Participant no.7	0.27	0.08	0.16	0.11	0.03	0.02	0.20	0.06	0.07
Participant no.8	0.29	0.09	0.15	0.11	0.03	0.02	0.16	0.06	0.08
Participant no.9	0.26	0.08	0.15	0.10	0.03	0.02	0.21	0.06	0.08
Mean	0.28	0.08	0.15	0.11	0.03	0.02	0.19	0.06	0.07
Std Deviation	0.02	0.01	0.02	0.00	0.00	0.00	0.02	0.00	0.01
Coefficient of variation	8%	7%	10%	4%	4%	5%	9%	7%	7%
Geometric Mean									
Priorities	0.28	0.08	0.15	0.11	0.03	0.02	0.19	0.06	0.07
IMPL	0.08	0.07	0.10	0.04	0.04	0.05	0.09	0.07	0.07

**Table 4.18** The Organisational Critical Success Factors Priorities according to the Dynamic Hierarchy among the Nine Participants

Organisational Critical Success Factors (CSFs)	Score	Accumulated Score
CSF 1	28%	28%
CSF 7	19%	47%
CSF 3	15%	62%
CSF 4	11%	73%
CSF 2	8%	81%
CSF 9	7%	88%
CSF 8	6%	94%
CSF 5	3%	98%
CSF 6	2%	100%
Summary	100%	
Consistency Ratio	8.1%	

The results of the implementation index (IMPL) of the Organisational Critical Success Factors (CFSs) of the Organisational Change Management from table 4.17 is between 0.04 to 0.10. this is less than 1.0, which is considered to be a very acceptable level.

In addition, table 4.18 shows that the consistency ratio of the Organisational Critical Success Factors (CSFs) is 8.1%, which is considered as an acceptable result.

**Figure 4.10** Priority Ranking of the Organisational Critical Success Factors (CSFs)

Moreover, table 4.18 and figure 4.10 show that Class A:CSFs (most important) Organisational Critical Success Factors (CSFs) consist of CSF1 (Change

Vision and Mission), CSF7 (Organisational Culture), and CSF3 (Organisational Change Strategy). These Organisational Critical Success Factors (CSFs) are classified to be the most important (>15%), for which continuous monitoring and corrective action must take place in order to achieve the goals and objectives. The Class B:CSFs (second most important) has a score between 7% and 11%, consisting of CSF4 (Organisational Infrastructure), CSF2 (Change Goals and Objectives), and CSF3 (Organisational Change Strategy), for which the organisation must keep monitoring regularly to integrate with Class A:CSFs and Class C:CSFs. Finally, Class C:CSFs is the third most important of the Organisational CSFs, which consist of CSF9 (Interorganisational Integration), CSF5 (Performance and Reward System), and CSF6 (Organisational Structure), which are considered as the supportive CSFs of Class A and Class B Organisational Critical Success Factors (CSFs) for which the organisation should monitor as supportive or long-term tracking.

#### **4.1.2.2.2 Human Capital Critical Success Factors (CSFs) of the Organisational Change Management**

The draft Human Capital Critical Success Factors (CSFs) of the Organisational Change Management was further developed through the interview of the nine participants using the Analytical Hierarchy Process (AHP). The semi-structured interview of the nine participants to pairwise the Human Capital Critical Success Factors (CSFs) from table B6 (appendix B) to classify into three classes of CSFs, these are 1) Class A (most important) of the Critical Success Factors (CSFs), 2) Class B (second most important) of the Critical Success Factors (CSFs) and 3) Class C (third most important) of the Critical Success Factors (CSFs).

The nine participants rank the pairwise comparison of the Human Capital Critical Success Factors (CSFs), in table B6 (appendix B), to compare the priority or the critical nature of each pair of two Critical Success Factors (CSFs) using the pairwise comparison scale of Analytical Hierarchy Process (AHP) from table B4 (appendix B), in order to weigh the priority or critical nature, and then use Microsoft Excel computer software to analyze the pairwise results, which can be presented in table 4.28, table 4.30 and figure 4.20 as follows.

The pairwise results show that the rank of the Human Capital Critical Success Factors (CSFs) can be grouped into three classes, in which Class A (most important) consists of CSF10 (Leadership Commitment and Support), CSF18 (Sense of Organisational Change Urgency), CSF13 (Employee Engagement). Class B (second most important) consists of CSF11 (Human Resource Competency), CSF16 (Quick Win Management), CSF17 (Organisational Change Champion). Class C (third most important) consists of CSF15 (Knowledge Management: KM Team), CSF14 (Effective Self-Managing Teamwork) and CSF12 (Human Capital Management) respectively.

### **The verification of the reliability of the priority ranking analysis of Human Capital CSFs Taxonomy**

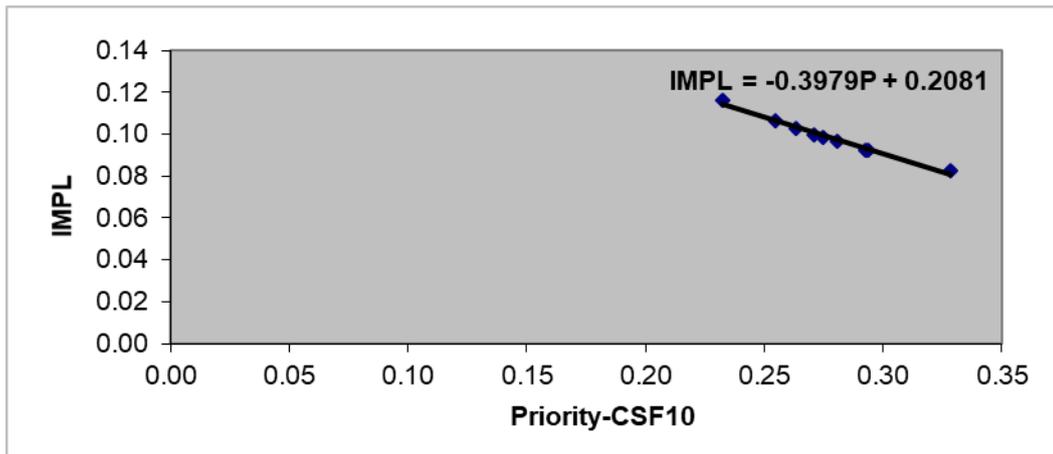
The reliability of the priority ranking of CSF10 (Leadership Commitment and Support) is measured through the implementation index (IMPL), and this is calculated by dividing the standard deviation by the priority ranking of the CSF10 (Leadership Commitment and Support) and can be presented as follows.

**Table 4.19** Implementation Index & Standard deviation (Criteria for Evaluation)  
CSF10 (Leadership Commitment and Support)

<b>Participants</b>	<b>Priorities</b>	<b>Std Deviation</b>	<b>IMPL</b>
Participant no.1	0.26	0.03	0.10
Participant no.2	0.29	0.03	0.09
Participant no.3	0.33	0.03	0.08
Participant no.4	0.23	0.03	0.12
Participant no.5	0.27	0.03	0.10
Participant no.6	0.25	0.03	0.11
Participant no.7	0.29	0.03	0.09
Participant no.8	0.28	0.03	0.10
Participant no.9	0.27	0.03	0.10
Overall Mean	0.28		
Std Deviation	0.03		
Coefficient of variation	10%		
Geometric Mean Priorities	0.28	0.03	0.10
IMPL	0.10		

The result of the implementation index (IMPL) of CSF10 (Leadership Commitment and Support) from table 4.19 is 0.10, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.11 shows that the slope between the implementation index (IMPL) and the CSF10 priority is negative (-0.3979), and it is considered that the relationship is very reliable.



**Figure 4.11** Priority-CSF10 and implementation index (IMPL) relationship

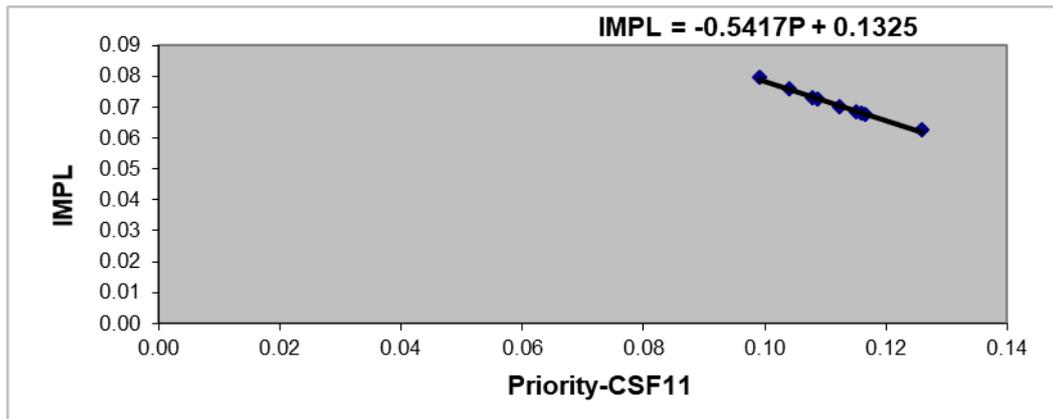
The reliability of the priority ranking of CSF11 (Human Resource Competency) is measured through the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF11 (Human Resource Competency) and can be presented as follows.

**Table 4.20** Implementation Index & Standard deviation (Criteria for Evaluation)  
CSF11 (Human Resource Competency)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.12	0.01	0.07
Participant no.2	0.10	0.01	0.08
Participant no.3	0.11	0.01	0.07
Participant no.4	0.12	0.01	0.07
Participant no.5	0.11	0.01	0.07
Participant no.6	0.13	0.01	0.06
Participant no.7	0.12	0.01	0.07
Participant no.8	0.11	0.01	0.07
Participant no.9	0.10	0.01	0.08
Overall Mean	0.11		
Std Deviation	0.01		
Coefficient of variation	7%		
Geometric Mean Priorities	0.11	0.01	0.07
IMPL	0.07		

The result of the implementation index (IMPL) of CSF11 (Human Resource Competency) from table 4.20 is 0.07, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.12 shows that the slope between the implementation index (IMPL) and the CSF11 priority is negative (-0.5417), and it is considered that the relationship is very reliable.



**Figure 4.12** Priority-CSF11 and implementation index (IMPL) relationship

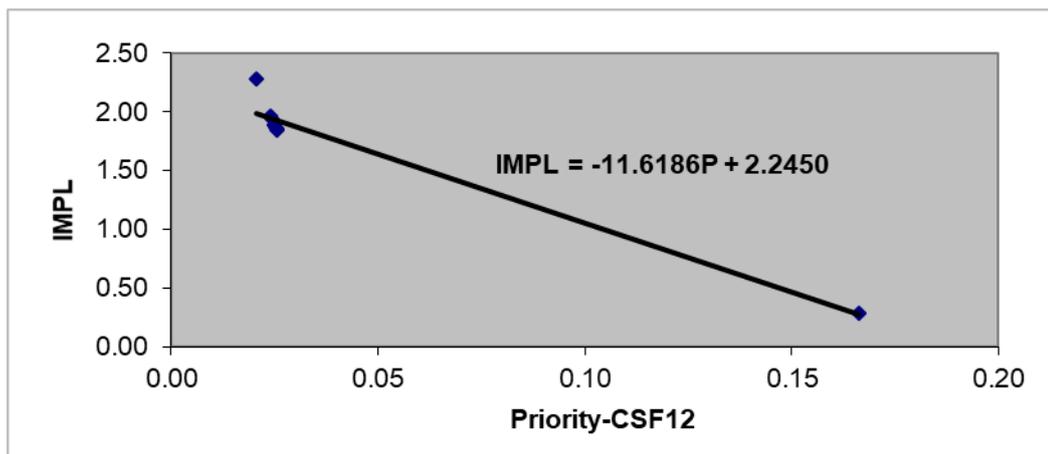
The reliability of the priority ranking of CSF12 (Human Capital Development) is measured through the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF12 (Human Capital Development) as is presented in table 4.21.

**Table 4.21** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF12 (Human Capital Development)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.03	0.05	1.86
Participant no.2	0.02	0.05	1.94
Participant no.3	0.02	0.05	1.96
Participant no.4	0.17	0.05	0.28
Participant no.5	0.03	0.05	1.84
Participant no.6	0.03	0.05	1.88
Participant no.7	0.02	0.05	2.28
Participant no.8	0.03	0.05	1.89
Participant no.9	0.03	0.05	1.86
Overall Mean	0.04		
Std Deviation	0.05		
Coefficient of variation	118%		
Geometric Mean Priorities	0.02	0.05	1.94
IMPL	1.94		

The result of the implementation index (IMPL) of CSF12 (Human Capital Development) from table 4.21 is 1.94, which is more than 1.0 but lower than 2.0; therefore, the reliability is at an acceptable level.

Moreover, Figure 4.13 shows that the slope between the implementation index (IMPL) and the CSF12 priority is negative (-11.6186), it is, therefore, considered that the relationship is very reliable.



**Figure 4.13** Priority-CSF12 and implementation index (IMPL) relationship

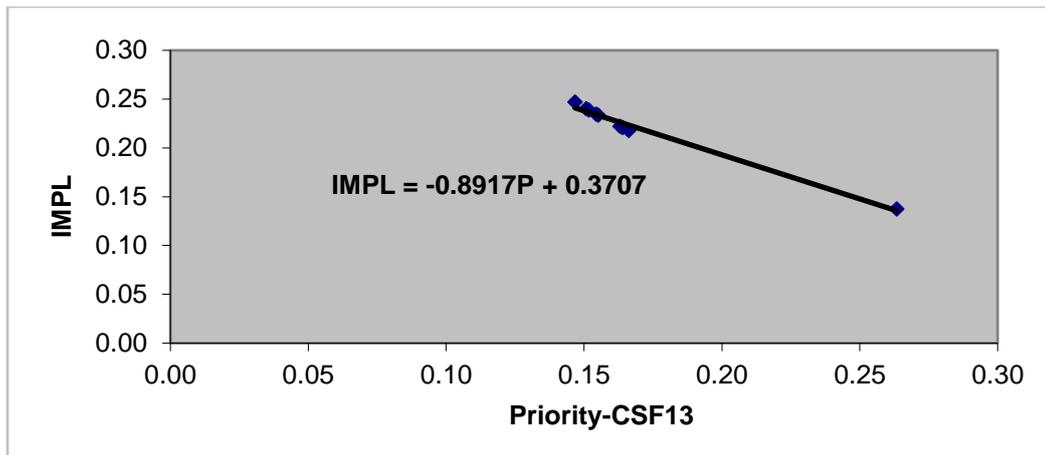
The reliability of the priority ranking of CSF13 (Employee Engagement) is measured through the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF13 (Employee Engagement) as is presented in table 4.22.

**Table 4.22** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF13 (Employee Engagement)

<b>Participants</b>	<b>Priorities</b>	<b>Std Deviation</b>	<b>IMPL</b>
Participant no.1	0.26	0.04	0.14
Participant no.2	0.16	0.04	0.22
Participant no.3	0.15	0.04	0.24
Participant no.4	0.17	0.04	0.22
Participant no.5	0.16	0.04	0.22
Participant no.6	0.15	0.04	0.23
Participant no.7	0.15	0.04	0.24
Participant no.8	0.16	0.04	0.23
Participant no.9	0.15	0.04	0.25
Overall Mean	0.17		
Std Deviation	0.04		
Coefficient of variation	22%		
Geometric Mean Priorities	0.16	0.04	0.23
IMPL	0.23		

The result of the implementation index (IMPL) of CSF13 (Employee Engagement) from table 4.22 is 0.23, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.14 shows that the slope between the implementation index (IMPL) and the CSF13 priority is negative (-0.8917), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.14** Priority-CSF13 and implementation index (IMPL) relationship

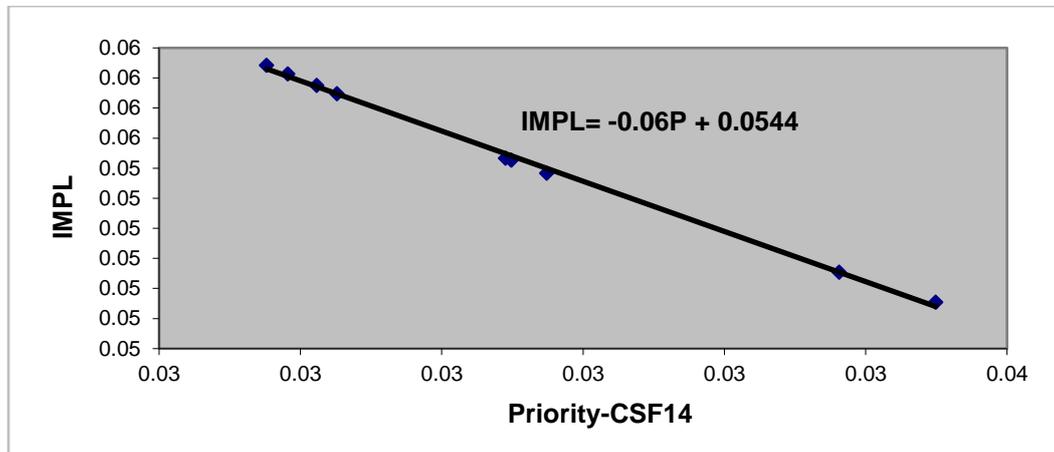
The reliability of the priority ranking of CSF14 (Effective Self-Managing Teamwork) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF14 (Effective Self-Managing Teamwork) as is presented in table 4.23.

**Table 4.23** Implementation Index & Standard deviation (Criteria for Evaluation)  
CSF14 (Effective Self-Managing Teamwork)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.03	0.00	0.05
Participant no.2	0.03	0.00	0.05
Participant no.3	0.03	0.00	0.06
Participant no.4	0.03	0.00	0.05
Participant no.5	0.03	0.00	0.05
Participant no.6	0.03	0.00	0.06
Participant no.7	0.03	0.00	0.05
Participant no.8	0.03	0.00	0.06
Participant no.9	0.03	0.00	0.06
Overall Mean	0.03		
Std Deviation	0.00		
Coefficient of variation	5%		
Geometric Mean Priorities	0.03	0.00	0.05
IMPL	0.05		

The result of the implementation index (IMPL) of CSF14 (Effective Self-Managing Teamwork) from table 4.23 is 0.05, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.15 shows that the slope between the implementation index (IMPL) and the CSF14 priority is negative (-0.06), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.15** Priority-CSF14 and implementation index (IMPL) relationship

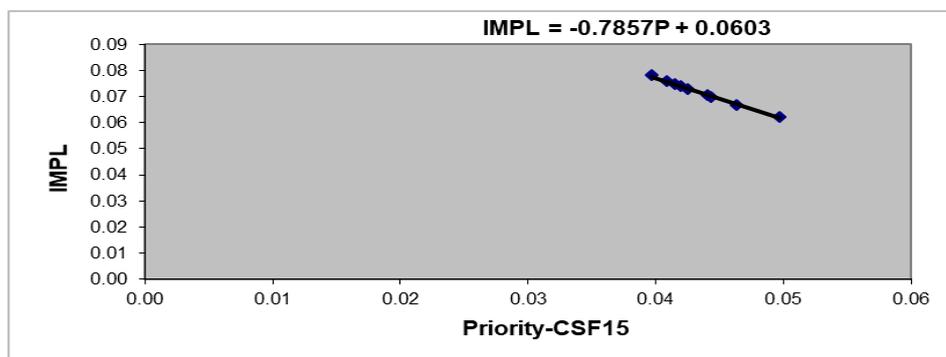
The reliability of the priority ranking of CSF15 (Knowledge Management (KM) Team) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF15 (Knowledge Management (KM) Team) as is presented in table 4.24.

**Table 4.24** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF15 (Knowledge Management (KM) Team)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.04	0.00	0.07
Participant no.2	0.04	0.00	0.07
Participant no.3	0.04	0.00	0.08
Participant no.4	0.05	0.00	0.07
Participant no.5	0.04	0.00	0.07
Participant no.6	0.04	0.00	0.08
Participant no.7	0.04	0.00	0.07
Participant no.8	0.04	0.00	0.07
Participant no.9	0.05	0.00	0.06
Overall Mean	0.04		
Std Deviation	0.00		
Coefficient of variation	7%		
Geometric Mean Priorities	0.04	0.00	0.07
IMPL	0.07		

The result of the implementation index (IMPL) of CSF15 (Knowledge Management (KM) Team) from table 4.24 is 0.07, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.16 shows that the slope between the implementation index (IMPL) and the CSF15 priority is negative (-0.06), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.16** Priority-CSF15 and implementation index (IMPL) relationship

The reliability of the priority ranking of CSF16 (Quick Win Management) is measured using the implementation index (IMPL), which is calculated by dividing the

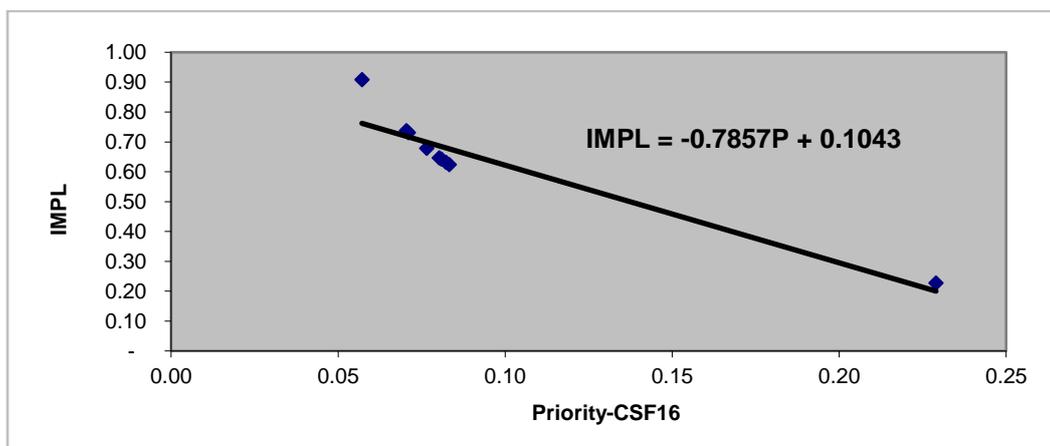
standard deviation by the priority ranking of the CSF16 (Quick Win Management) as is presented in table 4.25.

**Table 4.25** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF16 (Quick Win Management)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.08	0.05	0.63
Participant no.2	0.08	0.05	0.65
Participant no.3	0.07	0.05	0.73
Participant no.4	0.07	0.05	0.74
Participant no.5	0.08	0.05	0.62
Participant no.6	0.08	0.05	0.64
Participant no.7	0.08	0.05	0.68
Participant no.8	0.06	0.05	0.91
Participant no.9	0.23	0.05	0.23
Overall Mean	0.09		
Std Deviation	0.05		
Coefficient of variation	56%		
Geometric Mean Priorities	0.08	0.05	0.65
IMPL	0.65		

The result of the implementation index (IMPL) of CSF16 (Quick Win Management) from table 4.25 is 0.65, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.17 shows that the slope between the implementation index (IMPL) and the CSF16 priority is negative (-0.7857), and it is, therefore considered that the relationship is very reliable.



**Figure 4.17** Priority-CSF16 and implementation index (IMPL) relationship

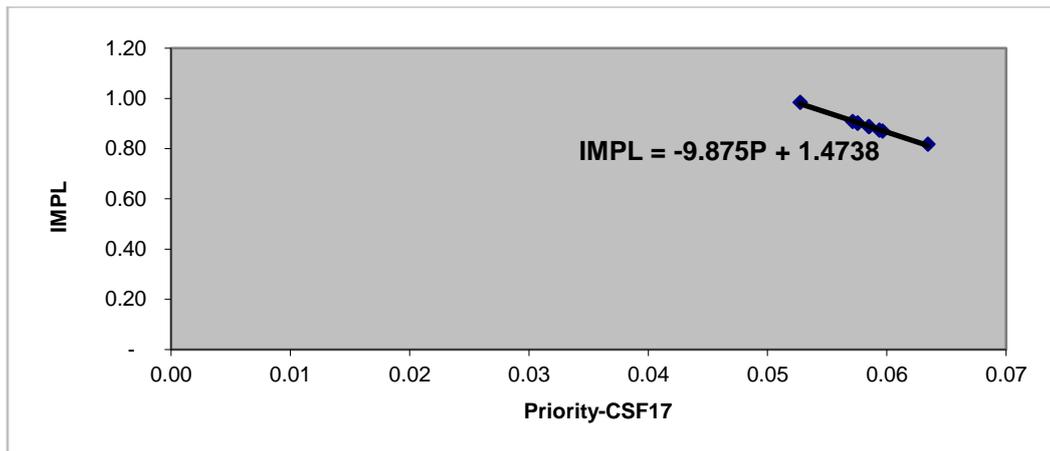
The reliability of the priority ranking of CSF17 (Organisational Change Champion) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF17 (Organisational Change Champion) as is presented in table 4.26.

**Table 4.26** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF17 (Organisational Change Champion)

<b>Participants</b>	<b>Priorities</b>	<b>Std Deviation</b>	<b>IMPL</b>
Participant no.1	0.06	0.05	0.89
Participant no.2	0.06	0.05	0.90
Participant no.3	0.05	0.05	0.98
Participant no.4	0.06	0.05	0.89
Participant no.5	0.06	0.05	0.82
Participant no.6	0.06	0.05	0.90
Participant no.7	0.06	0.05	0.87
Participant no.8	0.06	0.05	0.91
Participant no.9	0.06	0.05	0.87
Overall Mean	0.06		
Std Deviation	0.00		
Coefficient of variation	5%		
Geometric Mean Priorities	0.06	0.05	0.89
IMPL	0.05		

The result of the implementation index (IMPL) of CSF17 (Organisational Change Champion) from table 4.26 is 0.05, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.18 shows that the slope between the implementation index (IMPL) and the CSF17 priority is negative (-9.875), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.18** Priority-CSF17 and implementation index (IMPL) relationship

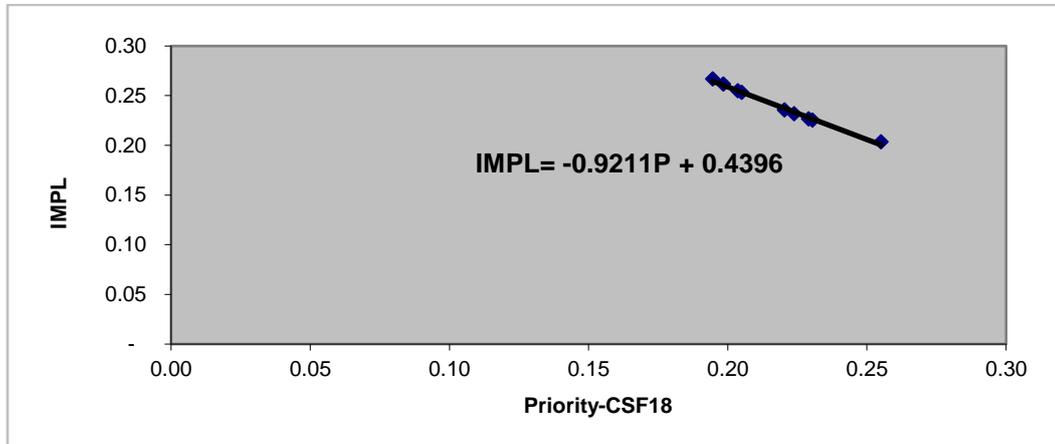
The reliability of the priority ranking of CSF17 (Organisational Change Champion) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF17 (Organisational Change Champion) as presented in table 4.27.

**Table 4.27** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF18 (Sense of Organisational Change Urgency)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.22	0.05	0.23
Participant no.2	0.20	0.05	0.25
Participant no.3	0.19	0.05	0.27
Participant no.4	0.26	0.05	0.20
Participant no.5	0.20	0.05	0.26
Participant no.6	0.23	0.05	0.23
Participant no.7	0.20	0.05	0.25
Participant no.8	0.22	0.05	0.24
Participant no.9	0.23	0.05	0.23
Overall Mean	0.22		
Std Deviation	0.02		
Coefficient of variation	9%		
Geometric Mean Priorities	0.22	0.05	0.24
IMPL	0.09		

The result of the implementation index (IMPL) of CSF18 (Sense of Organisational Change Urgency) from table 4.27 is 0.09, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.19 shows that the slope between the implementation index (IMPL) and the CSF18 priority is negative (-0.9211), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.19** Priority-CSF18 and implementation index (IMPL) relationship

The summary of all of the nine participants' pairwise approach evaluation hierarchy is calculated using the Analytical Hierarchy Process (AHP) analysis to calculate the overall evaluation of the priority ranking and the reliability of the results.

The summary approach evaluation hierarchy results of the Human Capital Critical Success Factors (CSFs) can be presented as follows.

**Table 4.28** Summary of Approach Evaluation Hierarchy of Nine Participants of the Human Capital Critical Success Factors (CSFs)

Human Capital CSFs	10	11	12	13	14	15	16	17	18	Row Sum	Avg Row Sum	Ranking
10	208/727	248/681	22/105	92/271	193/803	79/304	167/606	11/39	120/503	2.50	0.28	1
11	14/81	51/518	35/261	115/994	2/15	39/313	21/248	91/719	68/665	1.00	0.11	4
12	22/613	17/881	20/761	23/905	1/35	13/626	11/688	13/752	17/573	0.22	0.02	9
13	97/742	33/250	77/480	47/303	1/6	61/351	85/683	101/609	24/115	1.42	0.16	3
14	5/126	8/325	13/424	30/967	1/30	35/976	2/81	17/615	22/617	0.28	0.03	8
15	21/439	31/903	43/782	14/361	21/520	1/23	23/716	22/463	24/517	0.39	0.04	7
16	3/43	64/819	96/869	16/191	45/496	1/11	58/863	48/847	44/617	0.72	0.08	5
17	6/107	4/93	39/464	50/967	1/15	23/455	4/61	45/814	33/617	0.53	0.06	6
18	127/495	179/869	47/248	45/283	1/5	180/899	188/607	90/407	175/818	1.96	0.22	2

**Table 4.29** Implementation Index & Standard Deviation of Human Capital Critical Success Factors (CSFs) of the Organisational Change Management (9 participants)

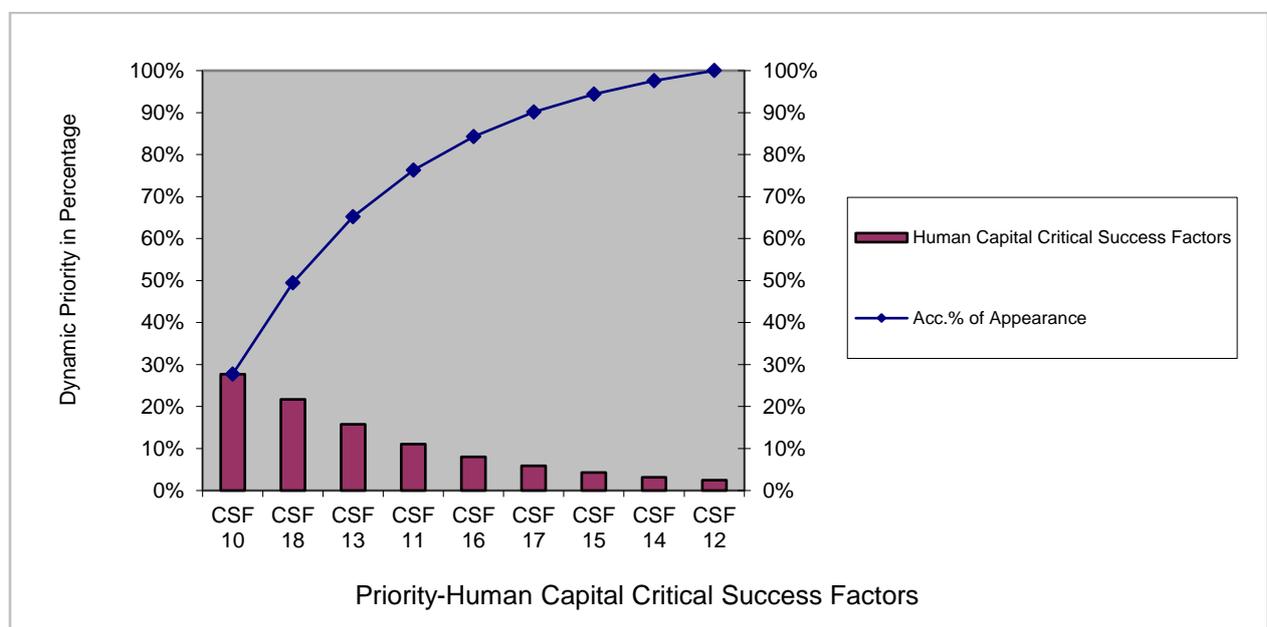
Participants	CSF10	CSF11	CSF12	CSF13	CSF14	CSF15	CSF16	CSF17	CSF18
Participant no.1	0.26	0.12	0.03	0.16	0.03	0.04	0.08	0.06	0.22
Participant no.2	0.29	0.10	0.02	0.16	0.03	0.04	0.08	0.06	0.20
Participant no.3	0.33	0.11	0.02	0.15	0.03	0.04	0.07	0.05	0.19
Participant no.4	0.23	0.12	0.02	0.17	0.03	0.05	0.07	0.06	0.26
Participant no.5	0.27	0.11	0.03	0.16	0.03	0.04	0.08	0.06	0.20
Participant no.6	0.25	0.13	0.03	0.15	0.03	0.04	0.08	0.06	0.23
Participant no.7	0.29	0.12	0.02	0.15	0.03	0.04	0.08	0.06	0.20
Participant no.8	0.28	0.11	0.03	0.16	0.03	0.04	0.08	0.06	0.22
Participant no.9	0.27	0.10	0.03	0.15	0.03	0.05	0.09	0.06	0.23
Mean	0.28	0.11	0.02	0.16	0.03	0.04	0.08	0.06	0.22
Std Deviation	0.03	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.02
Coefficient of variation	10%	7%	7%	4%	5%	7%	8%	5%	9%
Geometric Mean Priorities	0.28	0.11	0.02	0.16	0.03	0.04	0.08	0.06	0.22
IMPL	0.10	0.07	0.07	0.04	0.05	0.07	0.08	0.05	0.09

**Table 4.30** The Human Capital Critical Success Factors Priorities according to the Dynamics Hierarchy among the 9 Participants

Human Capital Critical Success Factors (CSFs)	% of Appearance	Acc.%of Appearance
CSF 10	28%	28%
CSF 18	22%	49%
CSF 13	16%	65%
CSF 11	11%	76%
CSF 16	8%	84%
CSF 17	6%	90%
CSF 15	4%	94%
CSF 14	3%	98%
CSF 12	2%	100%
Summary	100%	
Consistency Ratio	1.6%	

The results of the implementation index (IMPL) of Human Capital Critical Success Factors (CSFs) of the Organisational Change Management from table 4.29 is between 0.04 to 0.10, which is less than 1.0, which is considered to be a very acceptable level.

In addition, table 4.30 shows that the consistency ratio of the Human Capital Critical Success Factors (CSFs) is 1.6%, which is considered as an acceptable result.



**Figure 4.20** Priority Ranking of the Human Capital Critical Success Factors (CSFs)

Moreover, table 4.30 and figure 4.20 shows that the Class A:CSFs (most important) Human Capital Critical Success Factors (CSFs) consist of CSF10

(Leadership Commitment and Support), CSF18 (Sense of Organisational Change Urgency), and CSF13 (Employee Engagement). These Human Capital Critical Success Factors (CSFs) are classified to be the most important (>16%), for which continuous monitoring and corrective actions must take place in order to achieve the goals and objectives. The Class B:CSFs (second most important) has a score between 6% - 11%, consisting of CSF11 (Human Resource Competency), CSF16 (Quick Win Management), and CSF17 (Organisational Change Champion), which the organisation must monitor regularly to integrate with Class A:CSFs and Class C:CSFs. Finally, Class C:CSFs is the third most important Organisational CSFs, which consist of CSF15 (Knowledge Management (KM) Team), CSF14 (Effective Self-Managing Team), and CSF12 (Human Capital Management), these are considered as the supportive CSFs of Class A and Class B Human Capital, and the organisation should monitor these as supportive or long term tracking.

#### **4.1.2.2.3 Operations Critical Success Factors (CSFs) of the Organisational Change Management**

The nine participants rank the pairwise comparison of the Operations Critical Success Factors (CSFs) from table B7 (appendix B) to compare the priority or the criticalness of each pair of two Critical Success Factors (CSFs), using the pairwise comparison scale of Analytical Hierarchy Process (AHP) from table B4 (appendix B), to weigh the priority or criticalness and then use the Microsoft Excel computer software to analyze the pairwise results, which can be presented in table 4.40, table 4.42 and figure 4.30 as follows.

The nine participants conduct the pairwise to compare the level of the importance of the Operations Critical Success Factors (CSFs) of the Organisational Change Management. The pairwise results can be grouped into three classes, of which Class A (most important) consists of CSF19 (Operational Change Strategy), CSF21 (Business Process Management: BPM), and CSF23 (Organisational Strategic Alignment), Class B (second most important) consisted of CSF24 (Licensing Approval and Renewal Process), CSF26 (Project Management), CSF20 (Organisational Change Process), and Class C (third most important) consisted of CSF22 (Customer

Relationship Management: CRM), CSF25 (Hot Line System) and CSF27 (Continuous Improvement and Optimization) respectively.

### **The verification of the reliability of the priority ranking analysis of Operations CSFs Taxonomy**

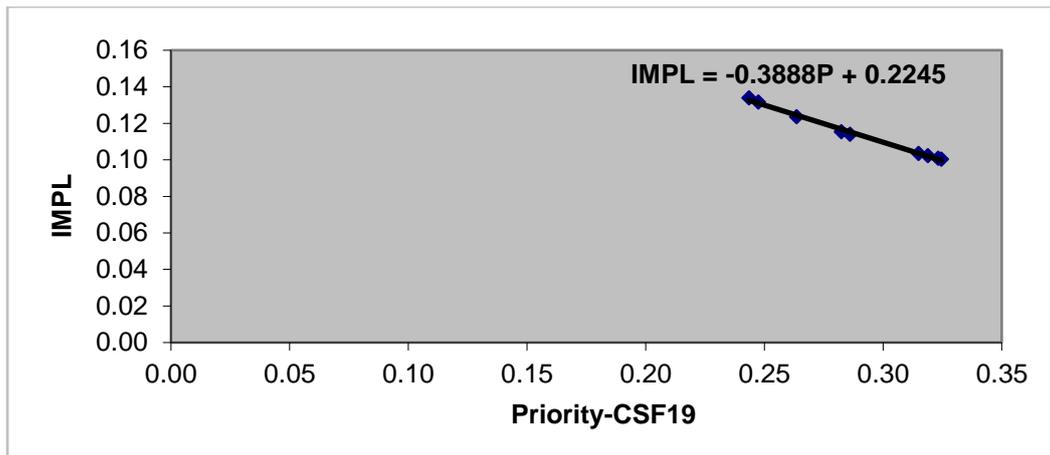
The reliability of the priority ranking of CSF19 (Operational Change Strategy) was measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF19 (Operational Change Strategy) as is presented in table 4.31.

**Table 4.31** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF19 (Operational Change Strategy)

<b>Participants</b>	<b>Priorities</b>	<b>Std Deviation</b>	<b>IMPL</b>
Participant no.1	0.26	0.03	0.12
Participant no.2	0.32	0.03	0.10
Participant no.3	0.32	0.03	0.10
Participant no.4	0.32	0.03	0.10
Participant no.5	0.25	0.03	0.13
Participant no.6	0.28	0.03	0.12
Participant no.7	0.32	0.03	0.10
Participant no.8	0.29	0.03	0.11
Participant no.9	0.24	0.03	0.13
Overall Mean	0.29		
Std Deviation	0.03		
Coefficient of Variation	11%		
Geometric Mean Priorities	0.29	0.03	0.11
IMPL	0.11		

The result of the implementation index (IMPL) of CSF19 (Operational Change Strategy) from table 4.31 is 0.11, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.21 shows that the slope between the implementation index (IMPL) and the CSF19 priority is negative (-0.3888), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.21** Priority-CSF19 and implementation index (IMPL) relationship

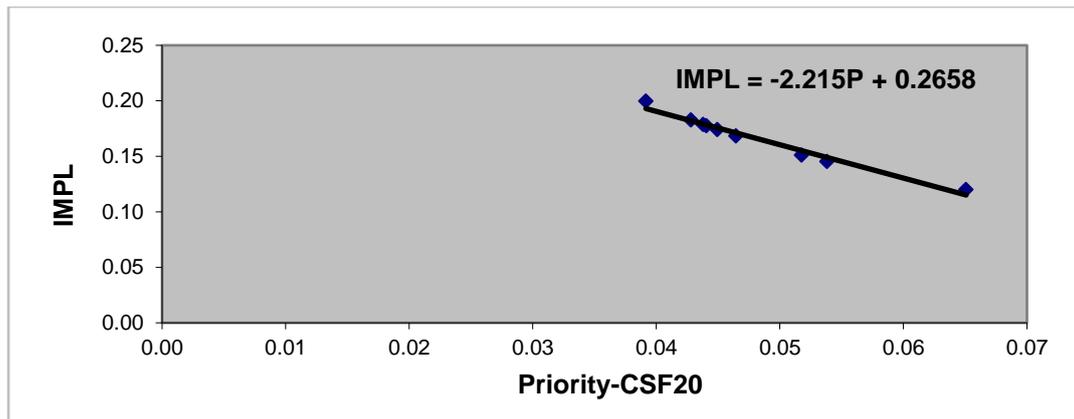
The reliability of the priority ranking of CSF20 (Organisational Change Process) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF20 (Organisational Change Process) as presented as follows.

**Table 4.32** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF20 (Organisational Change Process)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.07	0.01	0.12
Participant no.2	0.04	0.01	0.18
Participant no.3	0.04	0.01	0.18
Participant no.4	0.05	0.01	0.15
Participant no.5	0.05	0.01	0.15
Participant no.6	0.04	0.01	0.18
Participant no.7	0.04	0.01	0.20
Participant no.8	0.04	0.01	0.17
Participant no.9	0.05	0.01	0.17
Overall Mean	0.05		
Std Deviation	0.01		
Coefficient of Variation	16%		
Geometric Mean Priorities	0.05	0.01	0.17
IMPL	0.17		

The result of the implementation index (IMPL) of CSF20 (Organisational Change Process) from table 4.32 is 0.17, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.22 shows that the slope between the implementation index (IMPL) and the CSF20 priority is negative (-2.215), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.22** Priority-CSF20 and implementation index (IMPL) relationship

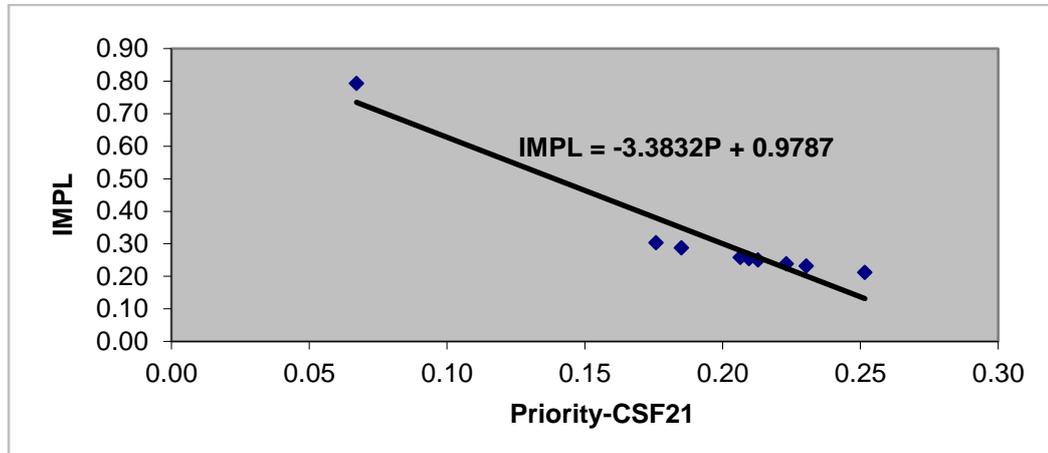
The reliability of the priority ranking of CSF21 (Business Process Management: BPM) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF21 (Business Process Management: BPM) and is presented as follows.

**Table 4.33** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF21 (Business Process Management: BPM)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.21	0.05	0.25
Participant no.2	0.18	0.05	0.30
Participant no.3	0.21	0.05	0.26
Participant no.4	0.07	0.05	0.79
Participant no.5	0.25	0.05	0.21
Participant no.6	0.22	0.05	0.24
Participant no.7	0.19	0.05	0.29
Participant no.8	0.21	0.05	0.25
Participant no.9	0.23	0.05	0.23
Overall Mean	0.20		
Std Deviation	0.05		
Coefficient of Variation	27%		
Geometric Mean Priorities	0.21	0.05	0.25
IMPL	0.25		

The result of the implementation index (IMPL) of CSF21 (Business Process Management: BPM) from table 4.33 is 0.25, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.23 shows that the slope between the implementation index (IMPL) and the CSF21 priority is negative (-3.3832), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.23** Priority-CSF21 and implementation index (IMPL) relationship

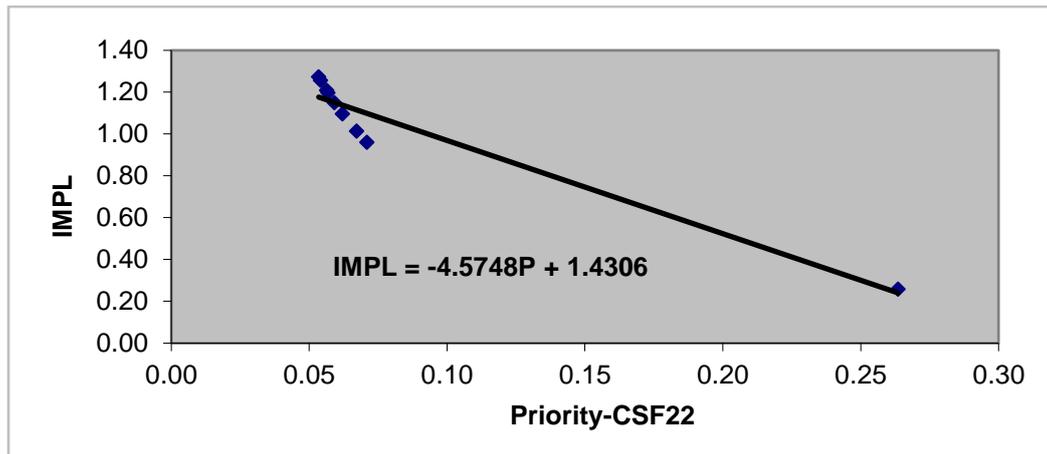
The reliability of the priority ranking of CSF22 (Customer Relationship Management: CRM) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF22 (Customer Relationship Management: CRM) and is presented in table 4.34.

**Table 4.34** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF22 (Customer Relationship Management: CRM)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.26	0.07	0.26
Participant no.2	0.07	0.07	0.96
Participant no.3	0.06	0.07	1.15
Participant no.4	0.07	0.07	1.01
Participant no.5	0.06	0.07	1.10
Participant no.6	0.06	0.07	1.20
Participant no.7	0.05	0.07	1.26
Participant no.8	0.05	0.07	1.27
Participant no.9	0.06	0.07	1.21
Overall Mean	0.08		
Std Deviation	0.07		
Coefficient of Variation	82%		
Geometric Mean Priorities	0.06	0.07	1.15
IMPL	1.15		

The result of the implementation index (IMPL) of CSF22 (Customer Relationship Management: CRM) from table 4.34 is 1.15, which is more than 1.0 but still lower than 2.0; therefore, the reliability is considered at an acceptable level.

Moreover, Figure 4.24 shows that the slope between the implementation index (IMPL) and the CSF22 priority is negative (-4.5784), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.24** Priority-CSF22 and implementation index (IMPL) relationship

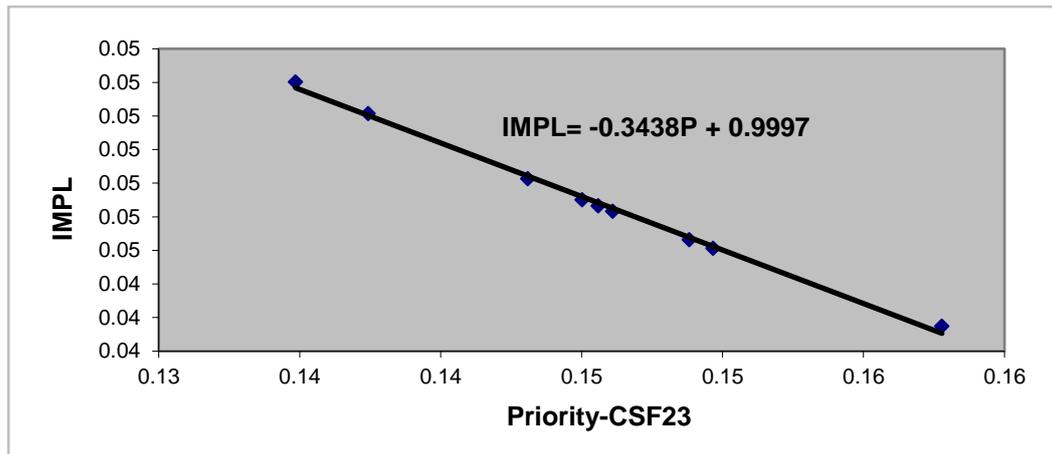
The reliability of the priority ranking of CSF23 (Organisational Strategic Alignment) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF23 (Organisational Strategic Alignment) and is presented in table 4.35.

**Table 4.35** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF23 (Organisational Strategic Alignment)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.16	0.01	0.04
Participant no.2	0.15	0.01	0.05
Participant no.3	0.15	0.01	0.05
Participant no.4	0.15	0.01	0.05
Participant no.5	0.15	0.01	0.05
Participant no.6	0.14	0.01	0.05
Participant no.7	0.15	0.01	0.05
Participant no.8	0.14	0.01	0.05
Participant no.9	0.13	0.01	0.05
Overall Mean	0.15		
Std Deviation	0.01		
Coefficient of Variation	5%		
Geometric Mean Priorities	0.15	0.01	0.05
IMPL	0.05		

The result of the implementation index (IMPL) of CSF23 (Organisational Strategic Alignment) from table 4.35 is 0.05, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.25 shows that the slope between the implementation index (IMPL) and the CSF23 priority is negative (-0.3438), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.25** Priority-CSF23 and implementation index (IMPL) relationship

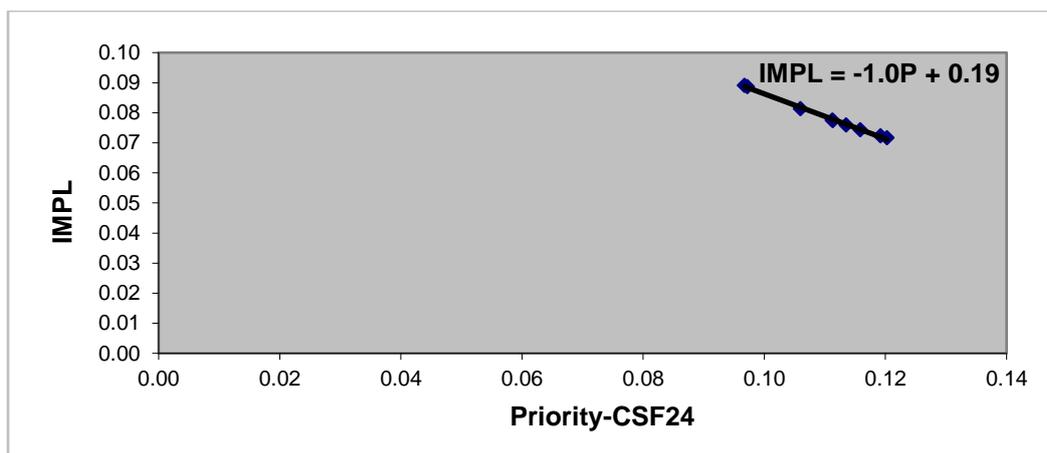
The reliability of the priority ranking of CSF24 (Licensing Approval and Renewal Process) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF24 (Licensing Approval and Renewal Process), as is presented in table 4.36.

**Table 4.36** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF24 (Licensing Approval and renewal Process)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.12	0.01	0.07
Participant no.2	0.11	0.01	0.08
Participant no.3	0.10	0.01	0.09
Participant no.4	0.10	0.01	0.09
Participant no.5	0.11	0.01	0.08
Participant no.6	0.11	0.01	0.08
Participant no.7	0.12	0.01	0.07
Participant no.8	0.11	0.01	0.08
Participant no.9	0.12	0.01	0.07
Overall Mean	0.11		
Std Deviation	0.01		
Coefficient of Variation	8%		
Geometric Mean Priorities	0.11	0.01	0.08
IMPL	0.08		

The result of the implementation index (IMPL) of CSF24 (Licensing Approval and renewal Process) from table 4.36 is 0.08, which is more than 1.0 but still lower than 2.0; therefore, the reliability is considered at an acceptable level.

Moreover, Figure 4.26 shows that the slope between the implementation index (IMPL) and the CSF24 priority is negative (-1.00), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.26** Priority-CSF24 and implementation index (IMPL) relationship

The reliability of the priority ranking of CSF25 (Hot Line System) is measured using the implementation index (IMPL), which is calculated by dividing the standard

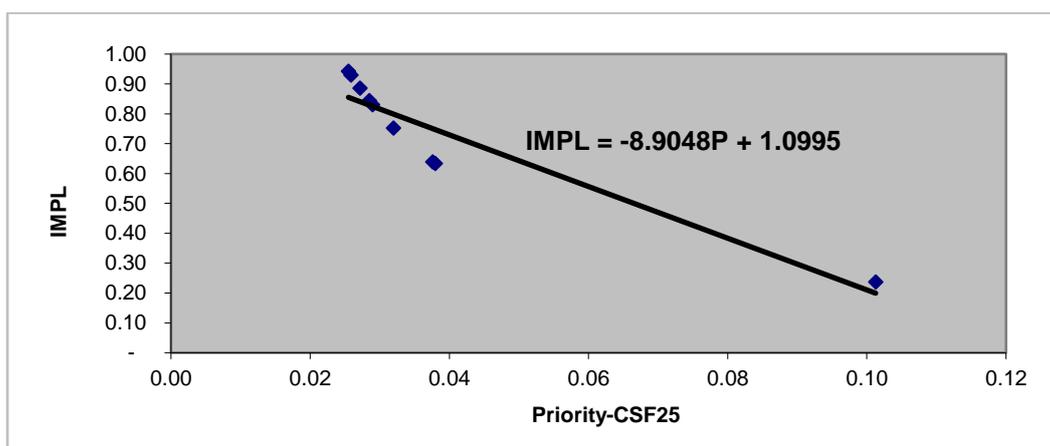
deviation by the priority ranking of the CSF25 (Hot Line System) and is presented as follows.

**Table 4.37** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF25 (Hot Line System)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.03	0.02	0.75
Participant no.2	0.03	0.02	0.84
Participant no.3	0.03	0.02	0.83
Participant no.4	0.03	0.02	0.89
Participant no.5	0.03	0.02	0.94
Participant no.6	0.04	0.02	0.64
Participant no.7	0.04	0.02	0.63
Participant no.8	0.10	0.02	0.24
Participant no.9	0.03	0.02	0.93
Overall Mean	0.04		
Std Deviation	0.02		
Coefficient of Variation	63%		
Geometric Mean Priorities	0.03	0.02	0.75
IMPL	0.75		

The result of the implementation index (IMPL) of CSF25 (Hot Line System) from table 4.37 is 0.75, which is less than 1.0; therefore, the reliability is considered as a very acceptable level.

Moreover, Figure 4.27 shows that the slope between the implementation index (IMPL) and the CSF25 priority is negative (-8.9048), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.27** Priority-CSF25 and implementation index (IMPL) relationship

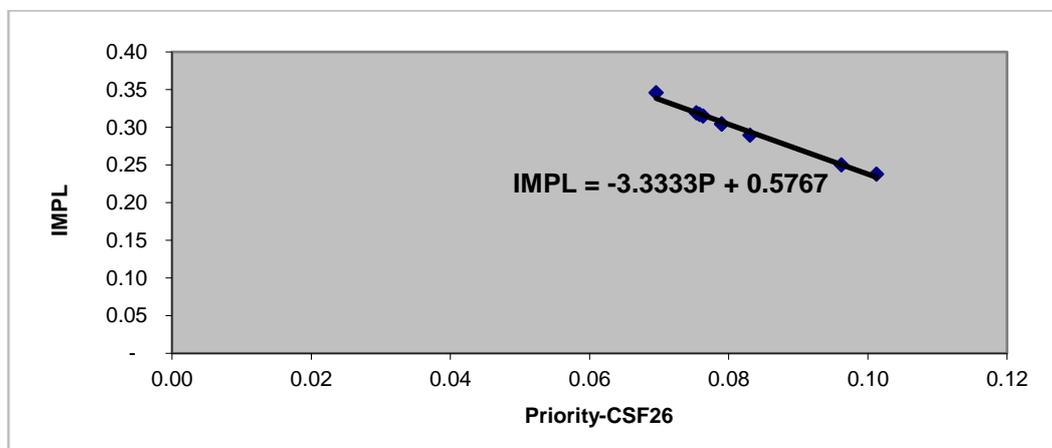
The reliability of the priority ranking of CSF26 (Project Management) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF26 (Project Management) as is presented in table 4.38.

**Table 4.38** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF26 (Project Management)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.08	0.02	0.32
Participant no.2	0.08	0.02	0.30
Participant no.3	0.08	0.02	0.30
Participant no.4	0.08	0.02	0.32
Participant no.5	0.08	0.02	0.29
Participant no.6	0.08	0.02	0.32
Participant no.7	0.07	0.02	0.35
Participant no.8	0.10	0.02	0.24
Participant no.9	0.10	0.02	0.25
Overall Mean	0.08		
Std Deviation	0.01		
Coefficient of Variation	13%		
Geometric Mean Priorities	0.08	0.02	0.30
IMPL	0.13		

The result of the implementation index (IMPL) of CSF26 (Project Management) from table 4.38 is 0.13, which is less than 1.0; therefore, the reliability is considered as a very acceptable level.

Moreover, Figure 4.28 shows that the slope between the implementation index (IMPL) and the CSF26 priority is negative (-3.3333), and it is, therefore, considered that the relationship is very reliable.



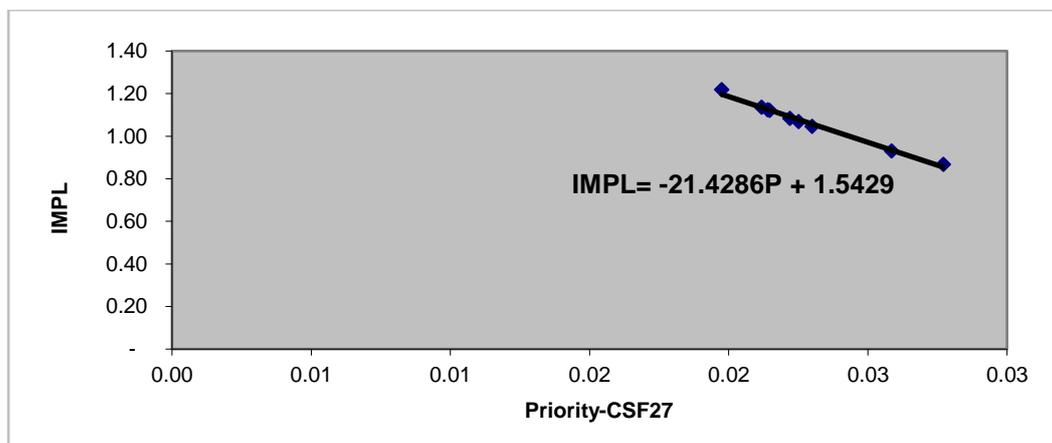
**Figure 4.28** Priority-CSF26 and implementation index (IMPL) relationship

**Table 4.39** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF27 (Continuous Improvement and Optimization)

Participations	Priorities	Std Deviation	IMPL
Participant no.1	0.02	0.02	1.07
Participant no.2	0.03	0.02	0.87
Participant no.3	0.02	0.02	1.08
Participant no.4	0.02	0.02	1.22
Participant no.5	0.02	0.02	1.14
Participant no.6	0.02	0.02	1.05
Participant no.7	0.02	0.02	1.12
Participant no.8	0.02	0.02	1.12
Participant no.9	0.03	0.02	0.93
Overall Mean	0.02		
Std Deviation	0.00		
Coefficient of Variation	11%		
Geometric Mean Priorities	0.02	0.02	1.05
IMPL	0.11		

The result of the implementation index (IMPL) of CSF27 (Continuous Improvement and Optimization) from table 4.39 is 0.11, which is less than 1.0; therefore, the reliability is considered as a very acceptable level.

Moreover, Figure 4.29 shows that the slope between the implementation index (IMPL) and the CSF27 priority is negative (-21.4286), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.29** Priority-CSF27 and implementation index (IMPL) relationship

The summary of all nine participants' pairwise approach evaluation hierarchy is calculated using the Analytical Hierarchy Process (AHP) analysis to seek the overall evaluation of the priority ranking and the reliability of the results. The summary approach evaluation hierarchy results of the Operations Critical Success Factors (CSFs) can be presented as follows.

**Table 4.40** Summary of Approach Evaluation Hierarchy of Nine Participants of the Operations Critical Success Factors (CSFs)**Normalized Matrix - Approximate Method**

Operations CSFs	19	20	21	22	23	24	25	26	27	Row Sum	Avg Row Sum	Ranking
19	7/22	220/943	7/19	203/850	14/39	332/971	136/587	171/554	7/32	2.62	0.29	1
20	27/457	12/277	20/503	11/265	25/826	13/428	53/867	1/23	49/744	0.41	0.05	7
21	79/453	123/559	103/510	186/787	183/884	229/941	177/890	209/894	152/881	1.89	0.21	2
22	44/573	8/133	33/670	20/347	21/515	13/280	9/163	44/651	25/317	0.53	0.06	6
23	43/372	14/75	50/393	40/217	3/23	40/353	163/992	129/923	153/970	1.32	0.15	3
24	16/177	133/960	42/521	41/340	91/814	95/978	16/115	81/920	123/917	1.00	0.11	4
25	46/963	7/284	16/453	24/661	9/326	11/453	4/115	1/41	29/837	0.29	0.03	8
26	75/964	45/598	3/46	41/637	5/71	1/12	39/362	4/53	11/100	0.73	0.08	5
27	1/25	7/387	31/963	4/199	1/44	14/703	4/561	1/53	11/400	0.21	0.02	9

**Table 4.41** Implementation Index & Standard Deviation of Operations Critical Success Factors (CSFs) of the Organisational Change Management (9 participants)

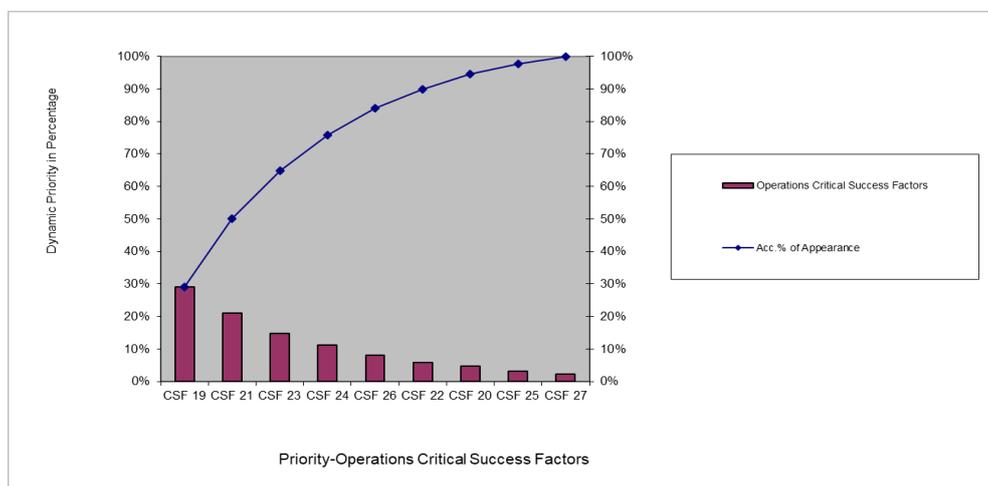
Participants	CSF19	CSF20	CSF21	CSF22	CSF23	CSF24	CSF25	CSF26	CSF27
Participant no.1	0.26	0.07	0.21	0.06	0.16	0.12	0.03	0.08	0.02
Participant no.2	0.32	0.04	0.18	0.07	0.15	0.11	0.03	0.08	0.03
Participant no.3	0.32	0.04	0.21	0.06	0.15	0.10	0.03	0.08	0.02
Participant no.4	0.32	0.05	0.19	0.07	0.15	0.10	0.03	0.08	0.02
Participant no.5	0.25	0.05	0.25	0.06	0.15	0.11	0.03	0.08	0.02
Participant no.6	0.28	0.04	0.22	0.06	0.14	0.11	0.04	0.08	0.02
Participant no.7	0.32	0.04	0.19	0.05	0.15	0.12	0.04	0.07	0.02
Participant no.8	0.29	0.04	0.21	0.05	0.14	0.11	0.03	0.10	0.02
Participant no.9	0.24	0.05	0.23	0.06	0.13	0.12	0.05	0.10	0.03
Mean	0.29	0.05	0.21	0.06	0.15	0.11	0.03	0.08	0.02
Std Deviation	0.03	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.00
Coefficient of Variation	11%	16%	11%	10%	5%	8%	20%	13%	11%
Geometric Mean Priorities	0.29	0.05	0.21	0.06	0.15	0.11	0.03	0.08	0.02
IMPL	0.11	0.17	0.11	0.10	0.05	0.08	0.21	0.13	0.11

**Table 4.42** The Operations Critical Success Factors Priorities according to the Dynamics Hierarchy among the 9 Participants

Operations Critical Success Factors (CSFs)	% of Appearance	Acc.%of Appearance
CSF 19	29%	29%
CSF 21	21%	50%
CSF 23	15%	65%
CSF 24	11%	76%
CSF 26	8%	84%
CSF 22	6%	90%
CSF 20	5%	94%
CSF 25	3%	98%
CSF 27	2%	100%
Summary	100%	
Consistency Ratio	0.7%	

The results of the implementation index (IMPL) of Operations Critical Success Factors (CFSs) of the Organisational Change Management from table 4.41 is between 0.05 and 0.21, which is less than 1.0; therefore, this is considered to be a very acceptable level.

In addition, table 4.42 shows that the consistency ratio of the Operations Critical Success Factors (CSFs) is 0.70%, which is considered as an acceptable result.

**Figure 4.30** Priority Ranking of the Operations Critical Success Factors (CSFs)

Moreover, table 4.42 and figure 4.30 shows that the Class A:CSFs (most important) Operations Critical Success Factors (CSFs) consists of CSF19 (Operational Change Strategy), CSF21 (Business Process Management: BPM), and CSF23 (Operational Strategic Alignment). These Operations Critical Success Factors (CSFs)

are classified to be the most important (>15%), and continuous monitoring and corrective actions must take place in order to achieve the goals and objectives. The Class B:CSFs (second most important) has a score between 6% - 11%, consisting of CSF24 (Licensing Approval and Renewal Process), CSF26 (Project Management), and CSF22 (Customer Relationship Management: CRM), for which the organisation must monitor regularly to integrate with Class A:CSFs and Class C:CSFs. Finally, Class C:CSFs is the third most important Operations CSFs, and they consist of CSF20 (Organisational Change Process), CSF25 (Hot Line System), and CSF27 (Continuous Improvement and Optimization), which are considered as the supportive CSFs of Class A and Class B Operations Critical Success Factors (CSFs), which the organisation should monitor as supportive or long term tracking.

#### **4.1.2.2.4 Technology Critical Success Factors (CSFs) of the Organisational Change Management**

The nine participants rank the pairwise comparison of the Technology Critical Success Factors (CSFs) from table B8 (appendix B) to compare the priority or the criticalness of each pair of two Critical Success Factors (CSFs), using the pairwise comparison scale of Analytical Hierarchy Process (AHP) from table B4, to weigh the priority or criticalness, and then use Microsoft Excel computer software to analyze the pairwise results, which are presented in table 4.52, table 4.53 and figure 4.40 as follows.

The pairwise results can also be grouped into three classes, of which Class A (most important) consists of CSF28 (Big Data Technology), CSF29 (Business Intelligence: BI Technology), CSF30 (Digital Government Technology), Class B (second most important) consists of CSF36 (Communication Technology), CSF33 (Technology Evaluation and Control System), CSF34 (Intergovernmental Integration Technology), and Class C (third most important) consisted of CSF35 (Customer Engagement Technology), CSF31 (Customer Support and Service: CSS), and CSF32 (Artificial Intelligence: AI Technology) respectively.

### The verification of the reliability of the priority ranking analysis of Technology CSFs Taxonomy

The reliability of the priority ranking of CSF28 (Big Data Technology) is measured using the implementation index (IMPL), which is calculated by dividing the standard deviation by the priority ranking of the CSF28 (Big Data Technology) as is presented in table 4.43.

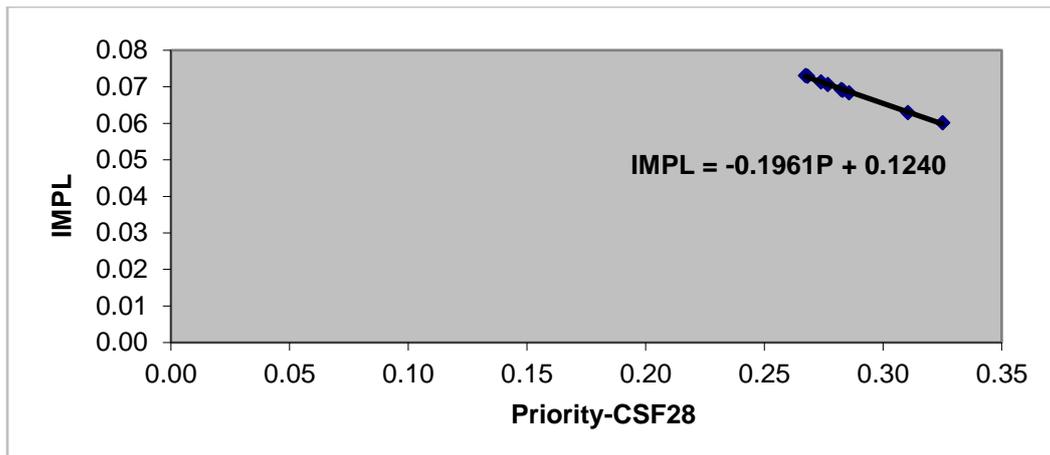
**Table 4.43** Implementation Index & Standard Deviation (Criteria for Evaluation)

#### CSF28 (Big Data Technology)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.27	0.02	0.07
Participant no.2	0.28	0.02	0.07
Participant no.3	0.31	0.02	0.06
Participant no.4	0.33	0.02	0.06
Participant no.5	0.27	0.02	0.07
Participant no.6	0.28	0.02	0.07
Participant no.7	0.28	0.02	0.07
Participant no.8	0.29	0.02	0.07
Participant no.9	0.27	0.02	0.07
Overall Mean	0.29		
Std Deviation	0.02		
Coefficient of Variation	7%		
Geometric Mean Priorities	0.29	0.02	0.07
IMPL	0.07		

The result of the implementation index (IMPL) of CSF28 (Big Data Technology) from table 4.43 is 0.07, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.31 shows that the slope between the implementation index (IMPL) and the CSF28 priority is negative (-0.1961), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.31** Priority-CSF28 and implementation index (IMPL) relationship

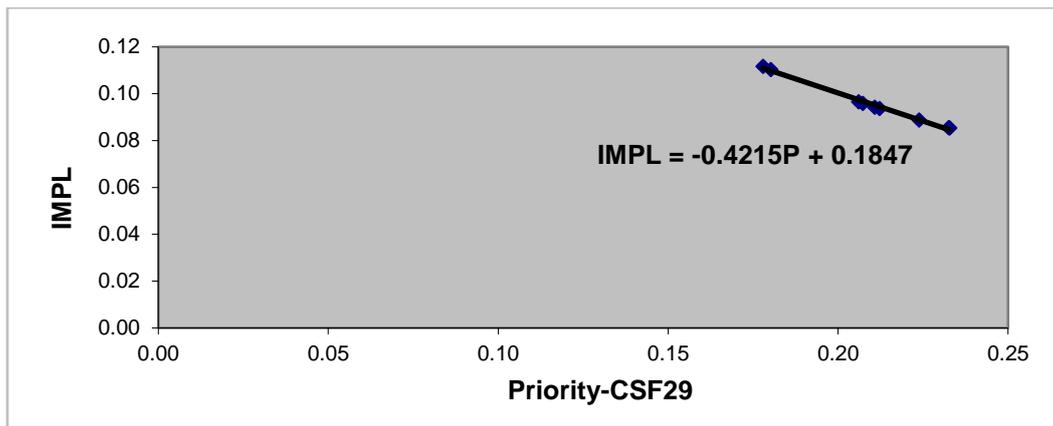
The reliability of the priority ranking of CSF29 (Business Intelligence: BI Technology) was measured using the implementation index (IMPL) in table 4.44.

**Table 4.44** Implementation Index & Standard deviation (Criteria for Evaluation)  
CSF29 (Business Intelligence: BI Technology)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.23	0.02	0.09
Participant no.2	0.18	0.02	0.11
Participant no.3	0.21	0.02	0.10
Participant no.4	0.18	0.02	0.11
Participant no.5	0.22	0.02	0.09
Participant no.6	0.21	0.02	0.10
Participant no.7	0.21	0.02	0.09
Participant no.8	0.21	0.02	0.09
Participant no.9	0.23	0.02	0.09
Overall Mean	0.21		
Std Deviation	0.02		
Coefficient of Variation	10%		
Geometric Mean Priorities	0.21	0.02	0.10
IMPL	0.10		

The result of the implementation index (IMPL) of CSF29 (Business Intelligence: BI) from table 4.44 is 0.10, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

Moreover, Figure 4.32 shows that the slope between the implementation index (IMPL) and the CSF29 priority is negative (-0.4215), and it is, therefore, considered that the relationship is very reliable.



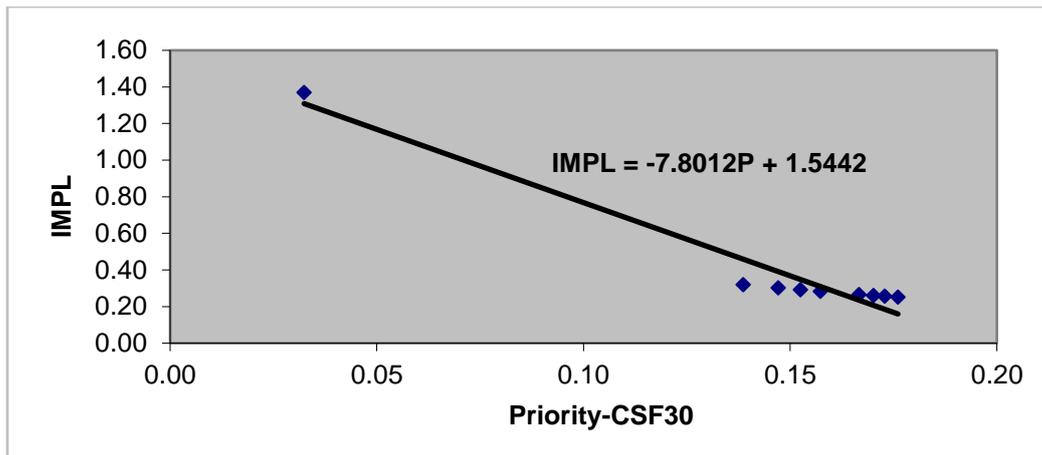
**Figure 4.32** Priority-CSF29 and implementation index (IMPL) relationship

**Table 4.45** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF30 (Digital Government Technology)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.15	0.04	0.30
Participant no.2	0.17	0.04	0.26
Participant no.3	0.14	0.04	0.32
Participant no.4	0.03	0.04	1.37
Participant no.5	0.17	0.04	0.27
Participant no.6	0.18	0.04	0.25
Participant no.7	0.17	0.04	0.26
Participant no.8	0.15	0.04	0.29
Participant no.9	0.16	0.04	0.28
Overall Mean	0.15		
Std Deviation	0.04		
Coefficient of Variation	30%		
Geometric Mean			
Priorities	0.16	0.04	0.28
IMPL	0.28		

The result of the implementation index (IMPL) of CSF30 (Digital Government Technology) from table 4.45 is 0.28, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.33 shows that the slope between the implementation index (IMPL) and the CSF30 priority is negative (-7.8012), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.33** Priority-CSF30 and implementation index (IMPL) relationship

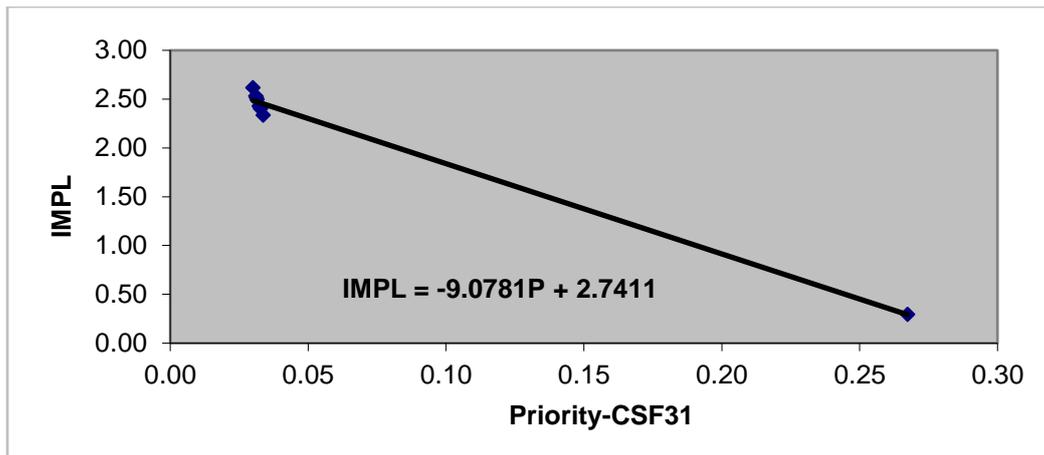
**Table 4.46** Implementation Index & Standard Deviation (Criteria for Evaluation)

CSF31 (Customer Support and Service: CSS)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.27	0.08	0.29
Participant no.2	0.03	0.08	2.50
Participant no.3	0.03	0.08	2.40
Participant no.4	0.03	0.08	2.42
Participant no.5	0.03	0.08	2.52
Participant no.6	0.03	0.08	2.62
Participant no.7	0.03	0.08	2.33
Participant no.8	0.03	0.08	2.43
Participant no.9	0.03	0.08	2.53
Overall Mean	0.06		
Std Deviation	0.08		
Coefficient of Variation	135%		
Geometric Mean Priorities	0.03	0.08	2.44
IMPL	2.44		

The result of the implementation index (IMPL) of CSF31 (Customer Support and Service: CSS) from table 4.46 is 2.44, which is higher than 1.0 but still less than 20%; therefore, the reliability is at an acceptable level.

In addition, Figure 4.34 shows that the slope between the implementation index (IMPL) and the CSF31 priority is negative (-9.0781), and it is, therefore, considered that the relationship is very reliable.



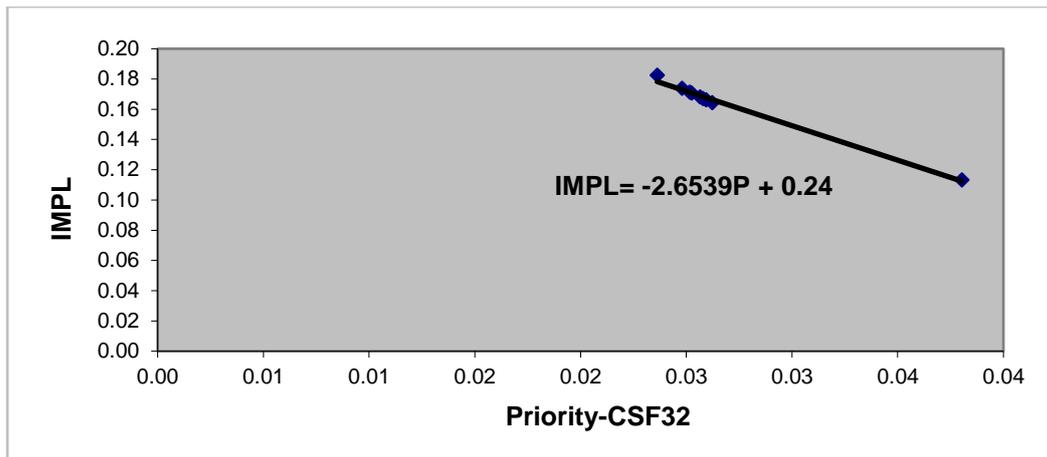
**Figure 4.34** Priority-CSF31 and implementation index (IMPL) relationship

**Table 4.47** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF32 (Artificial Intelligence (AI) Technology)

Participations	Priorities	Std Deviation	IMPL
Participant no.1	0.03	0.00	0.17
Participant no.2	0.02	0.00	0.18
Participant no.3	0.03	0.00	0.16
Participant no.4	0.03	0.00	0.17
Participant no.5	0.03	0.00	0.17
Participant no.6	0.02	0.00	0.17
Participant no.7	0.03	0.00	0.17
Participant no.8	0.03	0.00	0.17
Participant no.9	0.04	0.00	0.11
Overall Mean	0.03		
Std Deviation	0.00		
Coefficient of Variation	16%		
Geometric Mean Priorities	0.03	0.00	0.16
IMPL	0.16		

The result of the implementation index (IMPL) of CSF32 (Artificial Intelligence (AI) Technology) from table 4.47 is 0.16, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.35 shows that the slope between the implementation index (IMPL) and the CSF32 priority is negative (-2.6539), and it is, therefore, considered that the relationship is very reliable.



**Figure 4.35** Priority-CSF32 and implementation index (IMPL) relationship

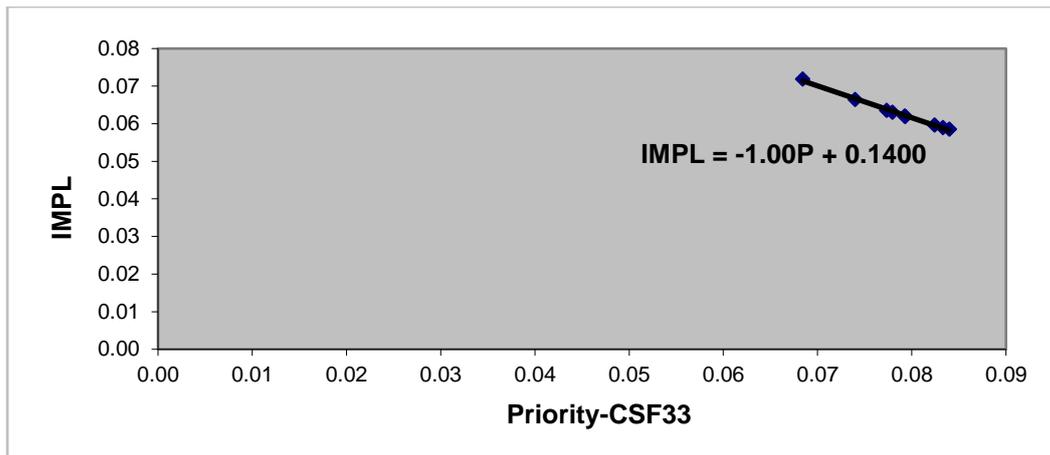
**Table 4.48** Implementation Index & Standard Deviation (Criteria for Evaluation)

CSF33 (Technology Evaluation and Control System)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.08	0.00	0.06
Participant no.2	0.08	0.00	0.06
Participant no.3	0.08	0.00	0.06
Participant no.4	0.08	0.00	0.06
Participant no.5	0.07	0.00	0.07
Participant no.6	0.08	0.00	0.06
Participant no.7	0.08	0.00	0.06
Participant no.8	0.08	0.00	0.06
Participant no.9	0.07	0.00	0.07
Overall Mean	0.08		
Std Deviation	0.00		
Coefficient of Variation	6%		
Geometric Mean Priorities	0.08	0.00	0.06
IMPL	0.06		

The result of the implementation index (IMPL) of CSF33 (Technology Evaluation and Control System) from table 4.48 is 0.06, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.36 shows that the slope between the implementation index (IMPL) and the CSF33 priority is negative (-1.00), and it is, therefore, considered that the relationship is very reliable.



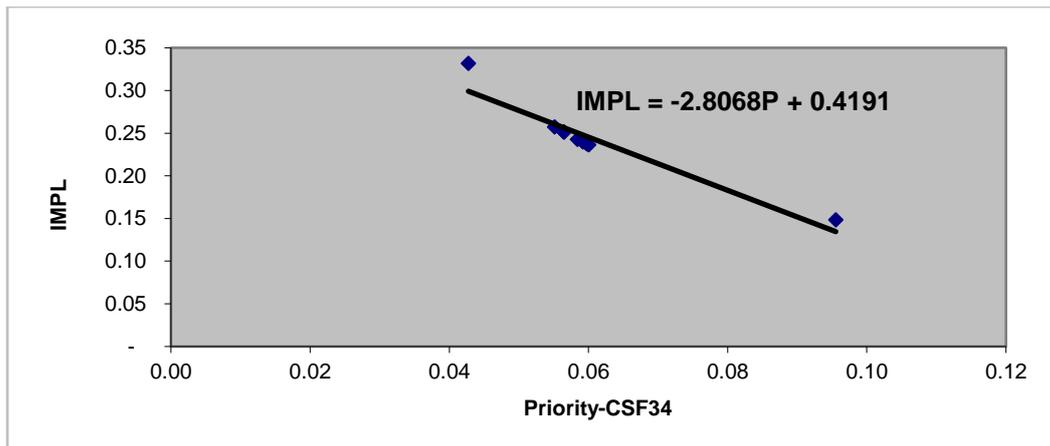
**Figure 4.36** Priority-CSF33 and implementation index (IMPL) relationship

**Table 4.49** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF34 (Intergovernmental Integration Technology)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.06	0.01	0.24
Participant no.2	0.06	0.01	0.24
Participant no.3	0.06	0.01	0.24
Participant no.4	0.06	0.01	0.24
Participant no.5	0.06	0.01	0.26
Participant no.6	0.06	0.01	0.25
Participant no.7	0.06	0.01	0.25
Participant no.8	0.04	0.01	0.33
Participant no.9	0.10	0.01	0.15
Overall Mean	0.06		
Std Deviation	0.01		
Coefficient of Variation	23%		
Geometric Mean Priorities	0.06	0.01	0.24
IMPL	0.24		

The result of the implementation index (IMPL) of CSF34 (Intergovernmental Integration Technology) from table 4.49 is 0.24, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.37 shows that the slope between the implementation index (IMPL) and the CSF34 priority is negative (-2.8068), and it is, therefore considered that the relationship is very reliable.



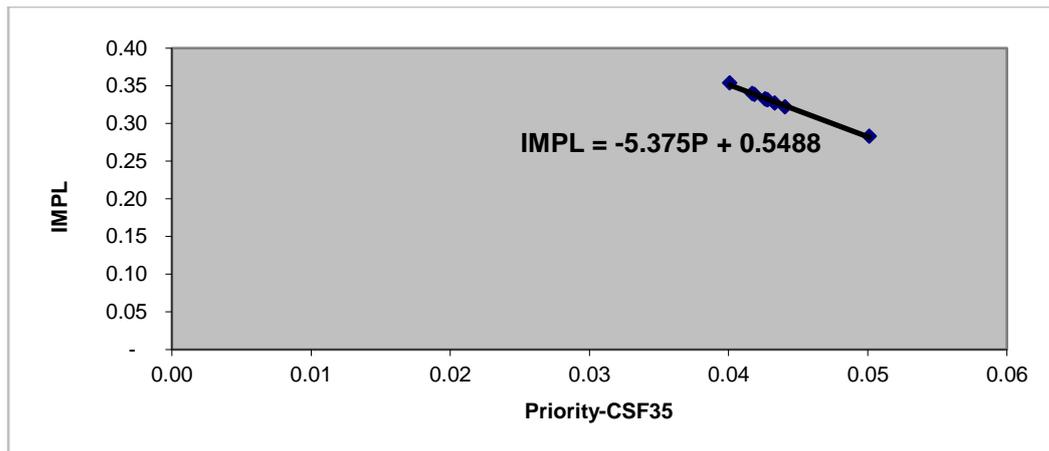
**Figure 4.37** Priority-CSF34 and implementation index (IMPL) relationship

**Table 4.50** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF35 (Customer Engagement Technology)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.04	0.01	0.33
Participant no.2	0.04	0.01	0.32
Participant no.3	0.04	0.01	0.33
Participant no.4	0.04	0.01	0.33
Participant no.5	0.04	0.01	0.35
Participant no.6	0.04	0.01	0.34
Participant no.7	0.05	0.01	0.28
Participant no.8	0.04	0.01	0.33
Participant no.9	0.04	0.01	0.34
Overall Mean	0.04		
Std Deviation	0.00		
Coefficient of Variation	6%		
Geometric Mean Priorities	0.04	0.01	0.33
IMPL	0.06		

The result of the implementation index (IMPL) of CSF35 (Customer Engagement Technology) from table 4.50 is 0.06, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.38 shows that the slope between the implementation index (IMPL) and the CSF35 priority is negative (-5.375), it is, therefore considered that the relationship is very reliable.



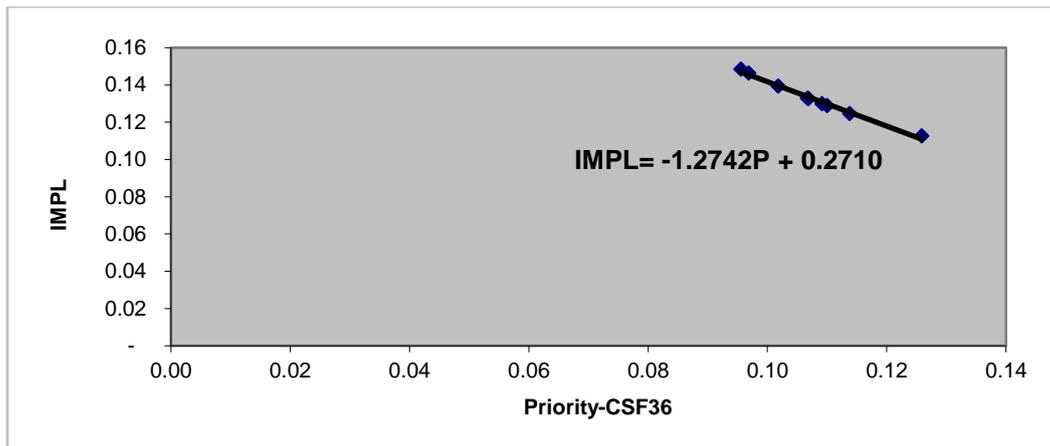
**Figure 4.38** Priority-CSF35 and implementation index (IMPL) relationship

**Table 4.51** Implementation Index & Standard Deviation (Criteria for Evaluation)  
CSF36 (Communication Technology)

Participants	Priorities	Std Deviation	IMPL
Participant no.1	0.11	0.01	0.13
Participant no.2	0.13	0.01	0.11
Participant no.3	0.11	0.01	0.13
Participant no.4	0.11	0.01	0.13
Participant no.5	0.11	0.01	0.13
Participant no.6	0.10	0.01	0.14
Participant no.7	0.10	0.01	0.15
Participant no.8	0.11	0.01	0.12
Participant no.9	0.10	0.01	0.15
Overall Mean	0.11		
Std Deviation	0.01		
Coefficient of Variation	9%		
Geometric Mean Priorities	0.11	0.01	0.13
IMPL	0.09		

The result of the implementation index (IMPL) of CSF36 (Communication Technology) from table 4.51 is 0.09, which is lower than 1.0; therefore, the reliability is at a very acceptable level.

In addition, Figure 4.39 shows that the slope between the implementation index (IMPL) and the CSF36 priority is negative (-1.2742), it is, therefore, considered that the relationship is very reliable.



**Figure 4.39** Priority-CSF36 and implementation index (IMPL) relationship

The summary of all nine participants' pairwise approach evaluation hierarchy is calculated using the Analytical Hierarchy Process (AHP) analysis to seek the overall evaluation of the priority ranking and the reliability of the results. The summary approach evaluation hierarchy results of the Technology Critical Success Factors (CSFs) are presented in table 4.52.

**Table 4.52** Implementation Index & Standard Deviation of Technology Critical Success Factors (CSFs) of the Organisational Change Management (9 participants)

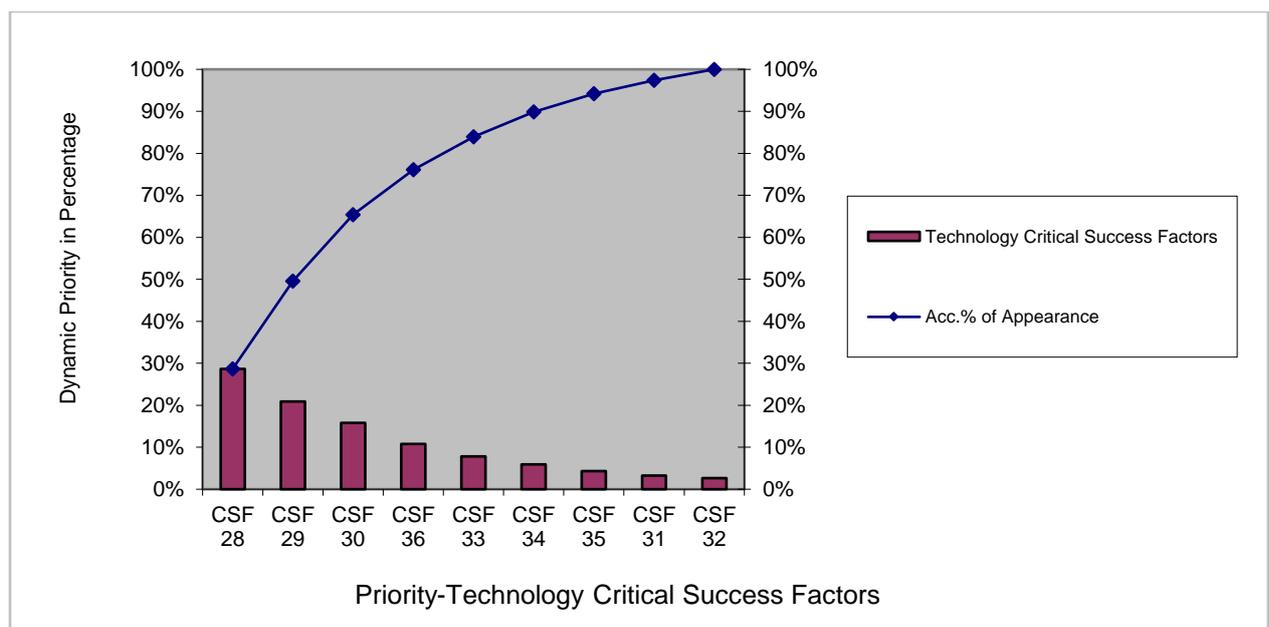
Participants	CSF28	CSF29	CSF30	CSF31	CSF32	CSF33	CSF34	CSF35	CSF36
Participant no.1	0.27	0.23	0.15	0.03	0.03	0.08	0.06	0.04	0.11
Participant no.2	0.28	0.18	0.17	0.03	0.02	0.08	0.06	0.04	0.13
Participant no.3	0.31	0.21	0.14	0.03	0.03	0.08	0.06	0.04	0.11
Participant no.4	0.33	0.18	0.15	0.03	0.03	0.08	0.06	0.04	0.11
Participant no.5	0.27	0.22	0.17	0.03	0.03	0.07	0.06	0.04	0.11
Participant no.6	0.28	0.21	0.18	0.03	0.02	0.08	0.06	0.04	0.10
Participant no.7	0.28	0.21	0.17	0.03	0.03	0.08	0.06	0.05	0.10
Participant no.8	0.29	0.21	0.15	0.03	0.03	0.08	0.06	0.04	0.11
Participant no.9	0.27	0.23	0.16	0.03	0.04	0.07	0.07	0.04	0.10
Mean	0.29	0.21	0.16	0.03	0.03	0.08	0.06	0.04	0.11
Std Deviation	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Coefficient of Variation	7%	10%	9%	3%	16%	6%	6%	6%	9%
Geometric Mean Priorities	0.29	0.21	0.16	0.03	0.03	0.08	0.06	0.04	0.11
IMPL	0.07	0.10	0.09	0.03	0.16	0.06	0.06	0.06	0.09

**Table 4.53** The Technology Critical Success Factors Priorities according to the Dynamic Hierarchy among the 9 Participants

Technology Critical Success Factors (CSFs)	% of Appearance	Acc.%of Appearance
CSF 28	29%	29%
CSF 29	21%	50%
CSF 30	16%	65%
CSF 36	11%	76%
CSF 33	8%	84%
CSF 34	6%	90%
CSF 35	4%	94%
CSF 31	3%	97%
CSF 32	3%	100%
Summary	100%	
Consistency Ratio	0.8%	

The results of the implementation index (IMPL) of Technology Critical Success Factors (CSFs) of the Organisational Change Management from table 4.52 is between 0.03 to 0.16, which is less than 1.0; therefore, this is considered to be at a very acceptable level.

In addition, the reliability of the priority ranking pairwise can be validated by the consistency ratio, for which the acceptable level should have a consistency of less than 20%, and a good consistency should have a consistency ratio of less than 5%. Table 4.53 shows that the consistency ratio of the Technology Critical Success Factors (CSFs) is 0.80%, which is considered as an acceptable result.

**Figure 4.40** Priority Ranking of the Technology Critical Success Factors (CSFs)

Moreover, table 4.53 and figure 4.40 show that the Class A:CSFs (most important) Technology Critical Success Factors (CSFs) consist of CSF28 (Big Data Technology), CSF29 (Business Intelligence: BI Technology), and CSF30 (Digital Government Technology). These Technology Critical Success Factors (CSFs) are classified to be the most important (>16%), for which continuous monitoring and corrective actions must take place in order to achieve the goals and objectives. The Class B:CSFs (second most important) has a score between 4% - 11%, consisting of CSF36 (Customer Engagement Technology), CSF33 (Technology Evaluation and Control System), and CSF34 (Intergovernmental Integration Technology), which the organisation must monitor regularly to integrate with Class A:CSFs and Class C:CSFs. Finally, Class C:CSFs is the third most important Technology Critical Success Factors (CSFs), and consists of CSF35 (Customer Engagement Technology), CSF31 (Customer Support and Service: CSS), and CSF32 (Artificial Intelligence: AI Technology), these are considered as the supportive CSFs of Class A and Class B Organisational Critical Success Factors (CSFs), and the organisation should monitor as supportive or long term tracking.

### **4.1.2.3 Action step 3: Develop the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management**

This step consists of using the results of action step 2 to further develop the Final Critical Success Factors (CSFs) Taxonomy for Organisational Change Management to prioritize and focus on the most important CSFs, second most important CSFs and the third most important CSFs respectively. The Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the Office of The National Broadcasting and Telecommunications Commission (NBTC) can be developed as shown in table 4.54.

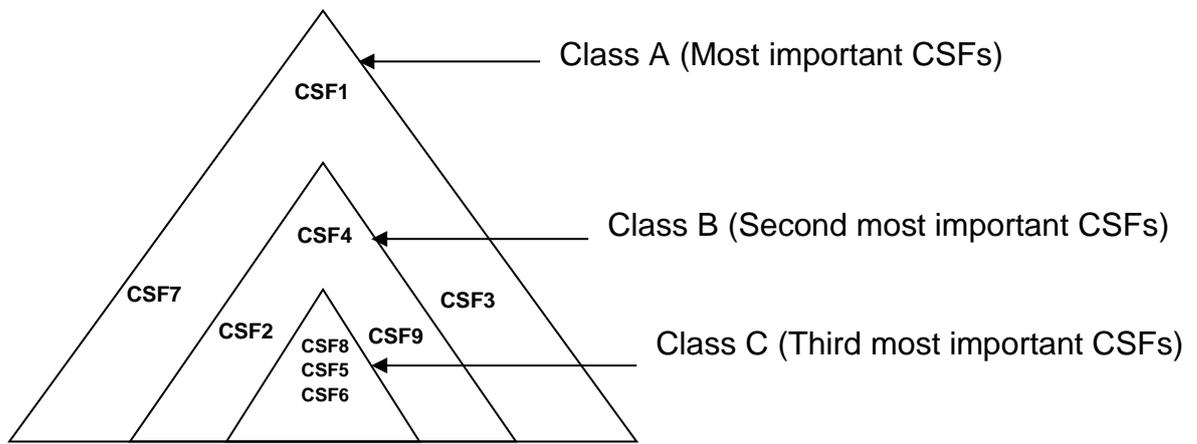
**Table 4.54** The Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the Office of The National Broadcasting and Telecommunications Commission (NBTC)

Group of Success Factors (CSFs)	CSFs Categories	Critical Success Factors (CSFs)
<b>1. Organisational Factors</b>	<b>Class A Organisational CSFs</b>	CSF 1 Change Vision and Mission CSF 7 Organisational Culture CSF 3 Organisational Change Strategy
	<b>Class B Organisational CSFs</b>	CSF 4 Organisational Infrastructure CSF 2 Change Goals and Objectives CSF 9 Interorganisational Integration
	<b>Class C Organisational CSFs</b>	CSF 8 Resource Allocation CSF 5 Performance and Reward System CSF 6 Organisational Structure
<b>2. Human Capital Factors</b>	<b>Class A Human Capital CSFs</b>	CSF 10 Leadership Commitment and Support CSF 18 Sense of Organisational Change Urgency CSF 13 Employee Engagement
	<b>Class B Human Capital CSFs</b>	CSF 11 Human Resource Competency CSF 16 Quick Win Management CSF 17 Organisational Change Champion
	<b>Class C Human Capital CSFs</b>	CSF 15 Knowledge Management (KM) Team CSF 14 Effective Self-Managing Teamwork CSF 12 Human Capital Development

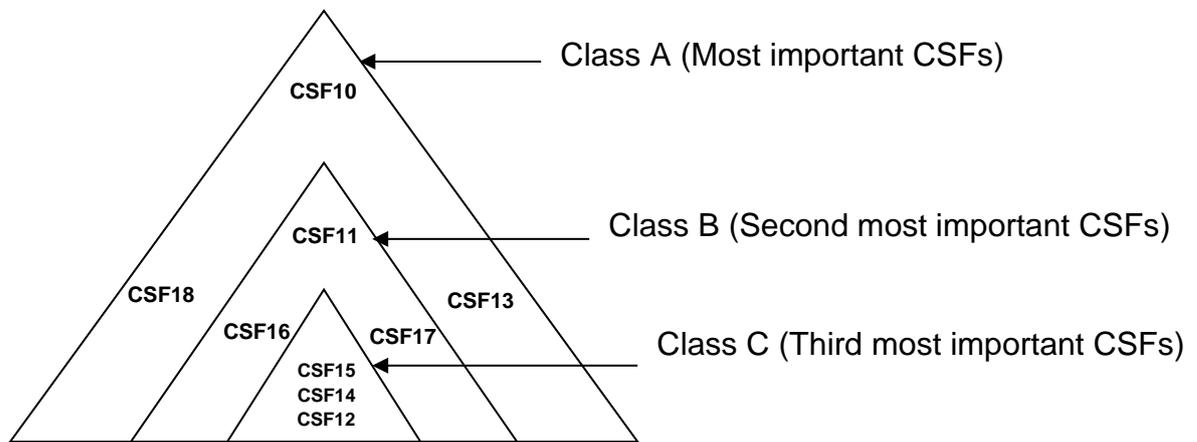
**Table 4.54** The Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the Office of The National Broadcasting and Telecommunications Commission (cont.)

Group of Success Factors (CSFs)	CSFs Categories	Critical Success Factors (CSFs)	
<b>3. Operations Factors</b>	<b>Class A Operations CSFs</b>	CSF 19 Operational Change Strategy CSF 21 Business Process Management (BPM) CSF 23 Organisational Strategic Alignment	
	<b>Class B Operations CSFs</b>	CSF 24 Licensing Approval and Renewal Process CSF 26 Project Management CSF 22 Customer Relationship Management (CRM)	
	<b>Class C Operations CSFs</b>	CSF 20 Organisational Change Process CSF 25 Hot Line System CSF 27 Continuous Improvement and Optimization	
	<b>4. Technology Factors</b>	<b>Class A Human Capital CSFs</b>	CSF 28 Big Data Technology CSF 29 Business Intelligence (BI) Technology CSF 30 Digital Government Technology
		<b>Class B Human Capital CSFs</b>	CSF 36 Communication Technology CSF 33 Technology Evaluation and Control System CSF 34 Intergovernmental Integration Technology
		<b>Class C Human Capital CSFs</b>	CSF 35 Customer Engagement Technology CSF 31 Customer Support and Service (CSS) CSF 32 Artificial Intelligence (AI) Technology

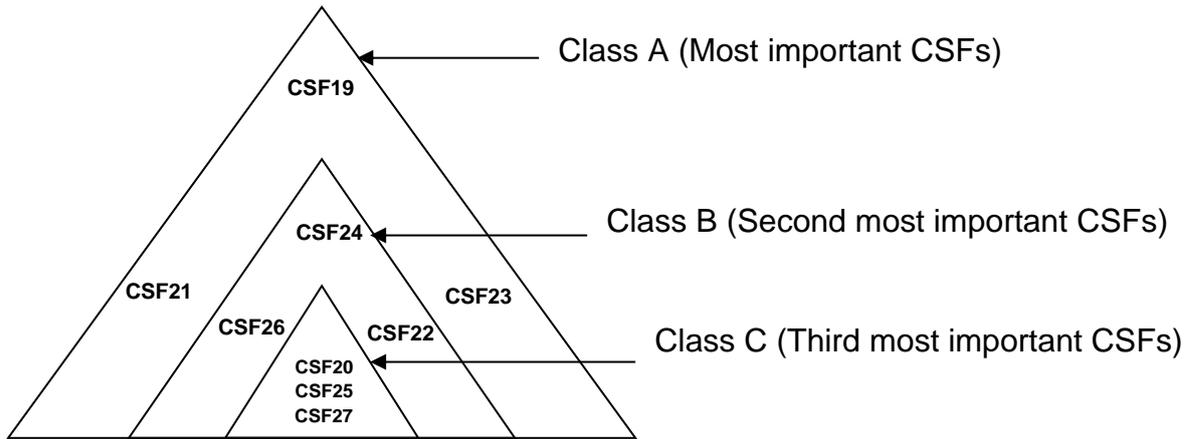
The Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management can also be presented in the classification of the Sand Cone Model, for which the most important CSFs must be on the outside layer as they must be visible (Ferdows and de Meyer, 1990). This can be shown in figure 4.41, 4.42, 4.43, 4.44, and 4.45.



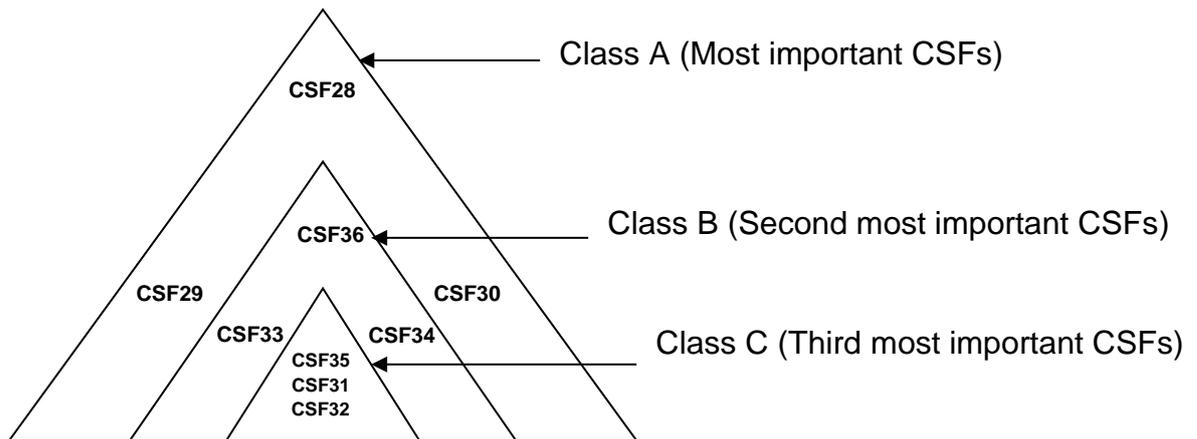
**Figure 4.41** Sand Cone Model for Organisational CSFs Taxonomy



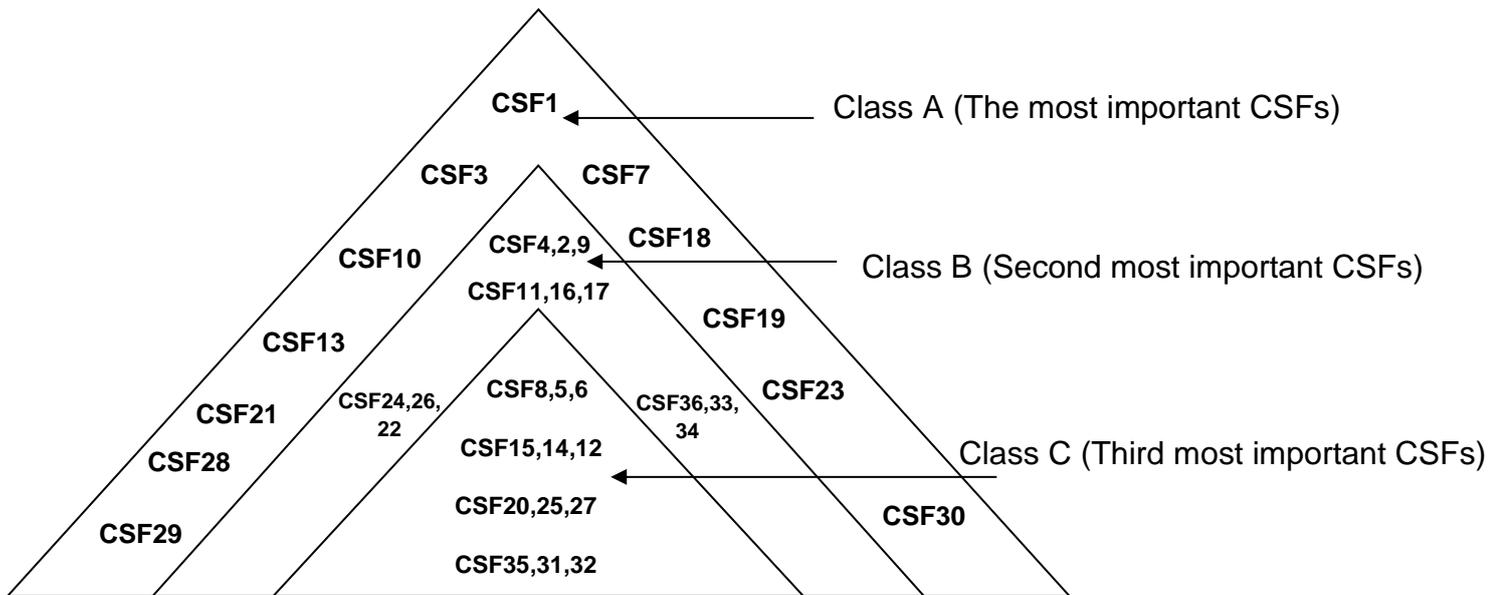
**Figure 4.42** Sand Cone Model for Human Capital CSFs Taxonomy



**Figure 4.43** Sand Cone Model for Operations CSFs Taxonomy



**Figure 4.44** Sand Cone Model of Technology CSFs Taxonomy



**Figure 4.45** Sand Cone Model of Final CSFs Taxonomy of the Organisational Change Management

#### 4.1.2.4 Action step 4: Reflection and sense making of action 2 of phase 1

This step is to reflect as well as sense making of the action cycle 2 of phase 1. The nine participants provide their inputs to pairwise to rank the priority of CSFs using the Analytic Hierarchy Process (AHP) from each categorized factor include (1) Organisational Critical Success Factors (CSFs), (2) Human Capital Critical Success Factors (CSFs), (3) Operations Critical Success Factors (CSFs), and (4) Technology Critical Success Factors (CSFs). In addition, the priority ranking of the CSFs creates three classes of each categorized CSFs, which are (1) Class A (the most important CSFs), (2) Class B (second most important), and (3) Class C (third most important (CSFs). The Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management is developed from the four categorized CSFs with three classes each as shows in table 4.56. I think that the Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management is more systematic compared with the two drafted CSFs Taxonomies, which enhances the clarity for the organisation to spend more time to focus on the most important CSFs of each categorized CSFs in order to implement the organisational change management more effectively. I have learned that the inputs of the expertise from nine participants are very important for me

to be able to develop the Final CSFs Taxonomy. I found that the priority ranking of the CSFs is very critical because the wrong priority ranking can cause the failure of the organisational change management from poor resource allocation as well as wrong decision making.

#### **4.2 Phase 2: Development of the new redesign of the business processes and Key Performance Indicators (KPIs) Taxonomy of Business Process Management (BPM)**

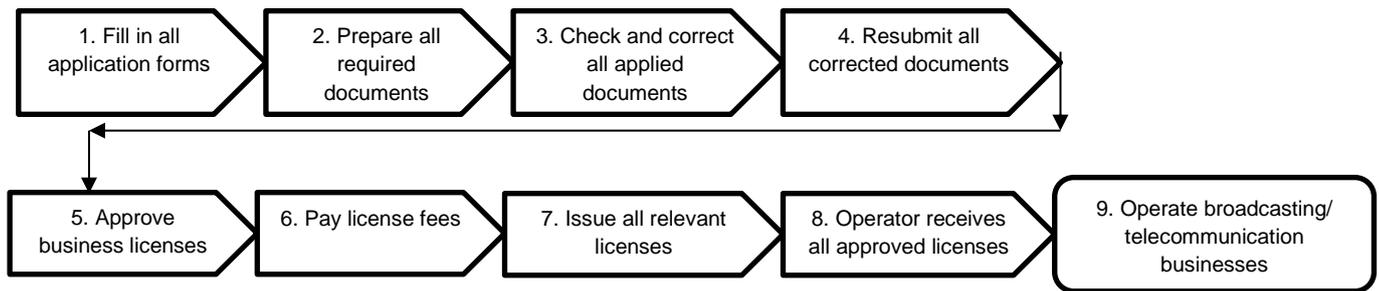
In phase 2 aims to develop the new redesign of the business processes of the Business Process Management (BPM) and to develop the Key Performance Indicators (KPIs) Taxonomy of Business Process Management (BPM) of the newly combined broadcasting and the telecommunication licensing bureau of the Office of the National Broadcasting and Telecommunications Commission (NBTC). In this phase consists of four action cycles, which three action cycles are conducted in chapter four and action cycle 4 is conducted in chapter five.

##### **4.2.1 Action cycle 1 of phase 2**

The action cycle 1 of phase 2 aims to develop the new design of the existing business processes of the new combined broadcasting and telecommunications.

**4.2.1.1 Action step 1: Review the Existing Business Processes:** The review aims understand the existing business processes of the newly combined broadcasting and telecommunications licensing bureau of the of the NBTC, which can be used for the Business Process Management (BPM). The action step 1 of action cycle 1 of phase 1 can be summarized as follows.

The existing business processes of the newly combined broadcasting and telecommunications licensing bureau of the NBTC is shown as figure 4.46. is the process of discovery to seek the relevant processes of the general current stage in the as-is-process models. The current frequency spectrum licensing business process model is presented as figure 4.57.



**Figure 4.46** Current frequency spectrum licensing business process model of the NBTC

From figure 4.57, the current frequency spectrum licensing business consists of nine steps 1) fill in all application forms, 2) prepare all required documents, 3) check and correct all documents, 4) resubmit all corrected documents, 5) approve business licenses, 6) pay license fees, 7) issue all relevant licenses, 8) operator receives all approved licenses, and 9) operate broadcasting/telecommunication businesses.

#### **4.2.1.2 Action step 2: In-depth Interview of nine participants about existing business processes:**

The in-depth interview of nine participants is conducted to seek for their inputs for the current problem or issues as well as suggestions for the existing business processes for the new combined broadcasting and telecommunications licensing bureau of the NBTC. The interview questions consist of two questions, which can be summarized as follows.

1. What do you think about the problems or issues of the existing business processes of the new combined broadcasting and telecommunications licensing bureau of the NBTC ?

**Table 4.55** The inputs of nine participants to the problems or issues of the existing business processes of the NBTC

Participants	1. What do you think about the problems or issues of the existing business processes of the new combined broadcasting and telecommunications licensing bureau of the NBTC ?
1	“The operators must fill in the application forms every time for both new frequency spectrum licenses or renewal frequency spectrum licenses, manually and themselves, this is considered as an intensive repetitive work effort.”
2	“The documents required for application are complicated and many, this causes both time consumption and high operating expenses.”
3	“The approval and corrective licensing applications take a very long time for both internal NBTC processes and coordinating with other relevant government agencies.”
4	“The frequency spectrum licensing approval involves highly personal judgement of government officers, and they might have different or unclear justification of their decisions.”
5	“The license fees payment must pay for many different frequency spectrum licenses; this causes inconvenience for the operators and took up a lot of time and operating expenses.”
6	“For the issuance of the frequency spectrum licenses it is necessary to apply to and receive approval from many different government agencies, which is ineffective and time consuming.”
7	“The collection of the frequency spectrum licenses is unable to utilize the electronic system.”
8	“The frequency spectrum license renewal process must start from the beginning every time, this leads to a repetitive renewal process that is considered a waste of time and resources.”
9	“The NBTC always take very long time to review the intensive required supporting document for the license approval process. These problems cause the operators too much time and cost.”

The inputs of nine participants of question number 1 are shown in table 4.55, which can be presented as follow.

The participant number 1 provides the inputs as follows.

“The operators must fill in the application forms every time for both new frequency spectrum licenses or renewal frequency spectrum licenses, manually and themselves, this is considered as an intensive repetitive work effort.”

The participant number 2 provides the inputs as follows.

“The documents required for application are complicated and many, this causes both time consumption and high operating expenses.”

The participant number 3 provides the inputs as follows.

“The approval and corrective licensing applications take a very long time for both internal NBTC processes and coordinating with other relevant government agencies.”

The participant number 4 provides the inputs as follows.

“The frequency spectrum licensing approval involves highly personal judgement of government officers, and they might have different or unclear justification of their decisions.”

The participant number 5 provides the inputs as follows.

“The license fees payment must pay for many different frequency spectrum licenses; this causes inconvenience for the operators and took up a lot of time and operating expenses.”

The participant number 6 provides the inputs as follows.

“For the issuance of the frequency spectrum licenses it is necessary to apply to and receive approval from many different government agencies, which is ineffective and time consuming.”

The participant number 7 provides the inputs as follows.

“The collection of the frequency spectrum licenses is unable to utilize the electronic system.”

The participant number 8 provides the inputs as follows.

“The frequency spectrum license renewal process must start from the beginning every time, this leads to a repetitive renewal process that is considered a waste of time and resources.”

The participant number 9 provides the inputs as follows.

“The NBTC always take very long time to review the intensive required supporting document for the license approval process. These problems cause the operators too much time and cost.”

I find that the inputs of nine participants from answer of question number 1 are very useful for me identify the problems and issues of the existing business processes of the new combined broadcasting and telecommunications licensing bureau of the NBTC. I can use these inputs for the effective Business Process Management (BPM).

2. Please provide the ideas or suggestions for the redesign of the Business Process Management (BPM) of the new combined broadcasting and telecommunications licensing bureau of the NBTC that can solve the problems or issues of the existing business processes.

The inputs of nine participants of question number 2 are shown in table 4.56, which can be presented as follow.

The participant number 1 provides the inputs as follows.

“The NBTC should have previous spectrum license document record of each operator in order shorten the renewal frequency spectrum licenses, which can improve the efficiency of the business processes.”

The participant number 2 provides the inputs as follows.

“The documents required for application should be reduced as simple as possible in order to reduce the time consumption as well as lower operating cost.”

The participant number 3 provides the inputs as follows.

“The approval and corrective licensing applications should take faster time for both internal NBTC processes and coordinating with other relevant government agencies.”

The participant number 4 provides the inputs as follows.

“The frequency spectrum licensing approval should be standardized in order to reduce personal judgement of government officers, who might have different or unclear justification of their decisions.”

The participant number 5 provides the inputs as follows.

“The license fees payment must pay for only single frequency spectrum licenses that can cover all licenses in order to decrease the inconvenience of the operators and reduce time and operating expenses.”

The participant number 6 provides the inputs as follows.

“For the issuance of the frequency spectrum licenses it should apply to and receive approval from NBTC as the central approval center for all relevant government agencies as one stop services, which is more effective and less time consuming.”

The participant number 7 provides the inputs as follows.

“The collection of the frequency spectrum licenses be able to utilize the electronic system in order to enhance the business process effectiveness.”

The participant number 8 provides the inputs as follows.

“The frequency spectrum license renewal process must not start from the beginning every time and reduce a repetitive renewal process that can enhance the efficiency of time and resources consuming.”

The participant number 9 provides the inputs as follows.

“The NBTC should shorten the review time of the required supporting document for the license approval process that can reduce the time consuming and operating cost of both NBTC and operators.”

From the inputs of nine participants of the answers of the question number 2, I find that the overall inputs suggested to improve speed, efficiency, and effectiveness of the existing business processes.

**Table 4.56** The inputs of nine participants to ideas or suggestions for the redesign of the Business Process Management (BPM) of the NBTC

Participants	<b>2. Please provide the ideas or suggestions for the redesign of the Business Process Management (BPM) of the new combined broadcasting and telecommunications licensing bureau of the NBTC that can solve the problems or issues of the existing business processes.</b>
1	<p>“The NBTC should have previous spectrum license document record of each operator in order shorten the renewal frequency spectrum licenses, which can improve the efficiency of the business processes.”</p>
2	<p>“The documents required for application should be reduced as simple as possible in order to reduce the time consumption as well as lower operating cost.”</p>
3	<p>“The approval and corrective licensing applications should take faster time for both internal NBTC processes and coordinating with other relevant government agencies.”</p>
4	<p>“The frequency spectrum licensing approval should be standardized in order to reduce personal judgement of government officers, who might have different or unclear justification of their decisions.”</p>
5	<p>“The license fees payment must pay for only single frequency spectrum licenses that can cover all licenses in order to decrease the inconvenience of the operators and reduce time and operating expenses.”</p>
6	<p>“For the issuance of the frequency spectrum licenses it should apply to and receive approval from NBTC as the central approval center for all relevant government agencies as one stop services, which is more effective and less time consuming.”</p>
7	<p>“The collection of the frequency spectrum licenses be able to utilize the electronic system in order to enhance the business process effectiveness.”</p>
8	<p>“The frequency spectrum license renewal process must not start from the beginning every time and reduce a repetitive renewal process that can enhance the efficiency of time and resources consuming.”</p>
9	<p>“The NBTC should shorten the review time of the required supporting document for the license approval process that can reduce the time consuming and operating cost of both NBTC and operators.”</p>

#### **4.2.1.3 Action step 3: Refine problems, issues, and suggestions of the existing business processes:**

The action step 3 is to refine problems, issues and suggestions of the existing business processes of the new combined broadcasting and telecommunications licensing bureau from inputs of the interview with nine participants. The results of this action step can be summarized as follows.

##### **(1) Refine problems and issues of the existing business processes**

The inputs from the interview of nine participants can refine problems and issues of the existing business processes as follows.

(1.1) There are many types of licenses to be allocated as well as renewed. These include radio broadcasting, terrestrial television, cable television, satellite television, internet television, mobile phone, internet, and satellite licenses. Each licensing process consumed an excess of manpower and time. The operators have to fill in application forms with a lot of documentation, such as personal information, company information, and the relevant approval document from other relevant government agencies, these include the Customs Department, Land Department and the Construction Department.

(1.2) The information required, and the supporting documents of the license application form are very complicated for the operators to fill in; therefore, the operators had to visit the regulatory government office on more than one occasion, which consumed a lot of time and expenses.

(1.3) The government officers in charge of the licensing process are insufficient considering the quantities of the licensing documents; therefore, the licensing approval and renewal process always takes a long time to complete, sometimes it is delayed, and this causes low customer satisfaction.

(1.4) The verification of the required supporting document, as these have to be checked with other government agencies, and this takes a very long time to coordinate and receive confirmation from other government agencies. For example, a corporate registration document needs confirmation from the Ministry of Commerce, the construction license needs confirmation from the Construction Department of the

Ministry of the Interior, and land ownership needs confirmation of the Land Department of the Ministry of the Interior.

(1.5) License fee payment requires the operators to come to pay by either cash or cheque, this caused the operators to spend a lot of time visiting the regulatory government office themselves.

(1.6) The regulatory government lacks digital government technology to enhance the efficiency and effectiveness of the licensing process.

(1.7) The staffs of the regulatory government lack knowledge and skills of digital government technology for the adoption of the advanced licensing process.

## **(2) Suggestions for the new redesign of the existing business processes**

The inputs from the interview of nine participants for suggestions to handle the problems and issues of the existing business processes as follows.

(2.1) The NBTC should have previous spectrum license document record of each operator in order shorten the renewal frequency spectrum licenses, which can improve the efficiency of the business processes.

(2.2) The documents required for application should be reduced as simple as possible in order to reduce the time consumption as well as lower operating cost.

(2.3) The approval and corrective licensing applications should take faster time for both internal NBTC processes and coordinating with other relevant government agencies.

(2.4) The frequency spectrum licensing approval should be standardized in order to reduce personal judgement of government officers, who might have different or unclear justification of their decisions.

(2.5) The license fees payment must pay for only single frequency spectrum licenses that can cover all licenses in order to decrease the inconvenience of the operators and reduce time and operating expenses.

(2.6) For the issuance of the frequency spectrum licenses it should apply to and receive approval from NBTC as the central approval center for all relevant government agencies as one stop services, which is more effective and less time consuming.

(2.7) The collection of the frequency spectrum licenses should be able to utilize the electronic system in order to enhance the business process effectiveness.

(2.8) The frequency spectrum license renewal process must not start from the beginning every time and reduce a repetitive renewal process that can enhance the efficiency of time and resources consuming.

(2.9) The NBTC should shorten the review time of the required supporting document for the license approval process that can reduce the time consuming and operating cost of both NBTC and operators.

#### **4.2.1.4 Action step 4: Develop the new redesign of the Business Processes:**

The action step 4 aims to develop new redesign of the Business Process Management (BPM) of the newly combined broadcasting and telecommunications licensing bureau of the NBTC.

The contributions from the nine participants is used to redesign the frequency spectrum licensing business processes. The license one concept is developed for the process redesign for the frequency spectrum licensing business processes in order to solve the problems or issues of the current frequency spectrum licensing business processes as presented in figure 4.47, which can be explained as follows.

#### **(4.1) New redesign of the business processes of the BPM**

(4.1.1) Design and develop the frequency spectrum licensing application via an electronic license (License One Platform Conceptual Design)

(4.1.2) Link the common data bases with other relevant government agencies to share the common online data bases of the required supporting application

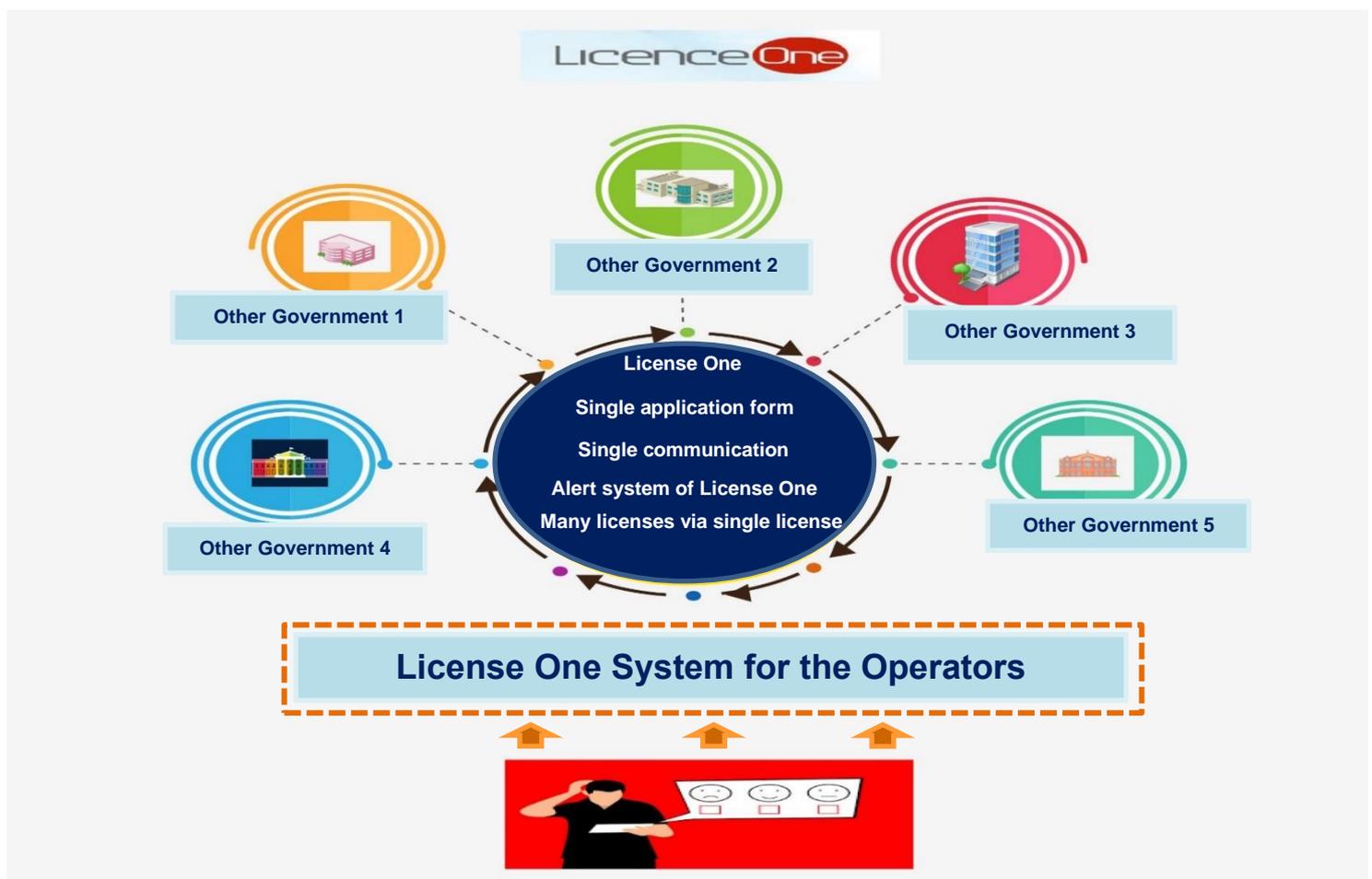
documents for the frequency spectrum licensing approval for both new license applications and renewal applications.

(4.1.3) Develop an electronic or digital system for the application for license submission process.

(4.1.4) Develop an alert and monitoring systems to track the progress and results of the license one application.

(4.1.5) Develop the license fee payment through the electronic payment system (e-payment)

(4.1.6) Develop the standard evaluation system of the electronic license one system.



**Figure 4.47** License one system of the frequency spectrum licensing business process management (BPM) of the NBTC

## **(4.2) The Business Process Management (BPM) implementation**

The Business Process Management (BPM) implementation of this action step is to implement the redesign frequency spectrum licensing business process of the License One System to ensure the sustainable success of the new Business Process Management (BPM). There are essential action plans to be implemented, which can be summarized as follows.

(4.2.1) Review and revise the rules, regulations, and procedures to conform with the new redesign frequency spectrum licensing business process of the License One System.

(4.2.2) Create a new big data center for the relevant government agencies to collaborate to develop and share the essential common data bases.

(4.2.3) Govern the License One System to be transparent, flexible, ethical and accountable, to gain confidence, trust, and respect among the different and relevant government agencies and operators.

(4.2.4) Develop the digital government service competence and knowledge for government officers to be capable to adapt to the change of the new redesign frequency spectrum licensing business process of the License One System.

(4.2.5) Embed the service minded corporate culture for government staff and officers to be energetic and proactive to serve the operators under the convergence disruptive technology of the broadcasting and telecommunication industries.

## **(4.3) Business Process Management (BPM) monitoring, evaluating and corrective actions**

The process monitoring system of the action step of the redesign frequency spectrum licensing business process of License One System must closely monitor the business process performance through the Key Performance Indicators (KPIs). These will be further developed in action cycle 2 to action cycle 4 of phase 2, which aims to develop the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM).

#### **4.2.2 Action cycle 2 of phase 2**

The action cycle of phase 2 aims to develop the drafted Key Performance Indicators (KPIs) Taxonomy of Business Process Management (BPM). This action cycle consists of four action steps. The results of four action steps of this cycle can be summarized as follows.

**4.2.2.1 Action step 1 of action cycle 2 of phase 2: Intensive literature review of the Key Performance Indicators (KPIs) of the Business Process Management (BPM):** The insider researcher conducts the intensive literature review of the Key Performance Indicators (KPIs) under the concept of the Balance Scorecard (BSC), which is shown in table B10. The list of the KPIs of the Business Process Management (BPM) is considered as the KPIs of the Business Process Perspective of the BSC in table B10.

**Table B10** The initial list of the potential Key Performance Indicators (KPIs) under the Balance Scorecard (BSC)

Perspectives	Key Performance Indicators (KPIs)
<b>Financial perspective</b>	FP1 Net License Revenue per Employee (\$) FP2 Total asset per employees (No.) FP3 Profit on total assets (\$) FP4 Profit per employee (\$) FP5 Return on equity (ROE) FP6 Gross margin (%) FP7 Operating Expense per Total License Fees (%) FP8 Return on investment (\$) FP9 Internal rate of return (%)
<b>Customer (operator) perspective</b>	CP1 Market share (%) CP2 Customer satisfaction index (%) CP3 Corporate image index (\$) CP4 License fee per operator (%) CP5 Operators per employees (No. or %) CP6 Average time spent on operator relations (No.) CP7 Operator rating (%) CP8 Cost per operator (\$) CP9 Number of operator complaints (No.)

**Table B10** The initial list of the potential Key Performance Indicators (KPIs) of the Business Process Management (BPM) (Cont.)

Perspectives	Key Performance Indicators (KPIs)
<b>Business Process Perspective</b>	BPP1 Operating expense per total license fee (%) BPP2 License renewal time (No.) BPP3 On-time license service process (%) BPP4 Productivity Improvement (%) BPP5 Lead time, product development (No.) BPP6 Lead time, from order to delivery (No.) BPP7 Average time for decision-making (No.) BPP8 Average time of complaint handling (No.) BPP9 Operating expense per operator (%)
<b>Innovation and growth perspective</b>	IGP1 Training hours per employee (No.) IGP2 Employee satisfaction index (%) IGP3 Leadership development expense per employee (\$) IGP4 Employee turnover (%) IGP5 Investment in process innovation per license revenue (%) IGP6 Investment in knowledge management per operators (No.) IGP7 Suggested improvements per employee (\$) IGP8 Absenteeism rate (%) IGP9 Direct communications to operators/year (No.)

**4.2.2.2 Action step 2 of action cycle 2 of phase 2: In-depth interview of nine participants about initial potential KPIs of the BPM:** The action step 2 of action cycle of phase 2 aims to refine the list of the initial potential KPIs of the BPM from the literature review as well as the inputs from the in-depth interview of nine participants.

The initial list of the potential KPIs of the BPM is developed from the intensive relevant literature review as shows in table B10. Please review table B10 and kindly the answer the following interview questions.

1. Do you think that the initial list of the potential KPIs of the BPM that is developed from the intensive relevant literature review is acceptable and relevant to the KPIs of the BPM of the NBTC?

“The overall answers of nine participants are in the same direction that all KPIs of the Business Process Management (BPM) under the Business Process Perspective of the Balance Scorecard (BSC) is acceptable and relevant to the BPM.”

2. Please provide additional comments or suggestions about the initial list of the potential KPIs that you might have.

The overall direction of nine participants is quite similar, which suggests that the KPIs should be classified into different classes based on the level of the importance in order to prioritize time and resources to focus on the most important KPIs more closely.

**4.2.2.3 Action step 3 of action cycle 2 of phase 2: Develop the drafted KPIs Taxonomy of the Business Process Management (BPM):**

This step is to adjust the proposed initial potential KPIs from the intensive literature review with the inputs from the interview of nine participants. The drafted KPIs Taxonomy of the Business Process Management (BPM) is further developed at this action step as shows in table B11.

**Table B11** Draft Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM)

<b>Performance Focused Area</b>	<b>Key Performance Indicators (KPIs)</b>
<b>Business Process Management (BPM)</b>	KPI 01. Net License Revenue per Employee KPI 02. Operating Expense per Total License Fees KPI 03. Customer Satisfaction Index KPI 04. License Renewal Time KPI 05. Productivity Improvement KPI 06. Ontime License Service Process KPI 07. Investment in Process innovation per License Revenue KPI 08. Employee Satisfaction Index KPI 09. Suggested Improvement per Employee

#### **4.2.2.4 Action step 4 of action cycle 2 of phase 2: Reflection and sense making of action cycle 2 of phase 2:**

The action cycle 2 of phase 2, the in-depth interview of nine participants provides the valuable inputs to develop the drafted Key Performance Indicators (KPIs) of the Business Process Management (BPM) from the list of the potential KPIs of the business process perspective under Balance Scorecard (BSC) that is reviewed in chapter as shows in table B10. The drafted KPIs Taxonomy of the BPM is shown in table B11. All nine participants accept the drafted KPIs Taxonomy and also provide additional suggestions that each KPI of the KPIs Taxonomy should be classified according to the level of the importance to the BPM. I agree that the KPIs Taxonomy should further develop to classify each KPI to reflect its level of the importance in order for the NBTC to allocate resources as well as put high efforts to the most important KPIs to ensure that the BPM is implemented effectively.

#### **4.2.3 Action cycle 3 of phase 2**

The action cycle 3 of phase 2 aims to develop the final Key Performance Indicators (KPIs) of the Business Process Management (BPM) of the newly combined

broadcasting and telecommunications of the NBTC. This action cycle consists of 4 action steps and can be the analysis as follows.

#### **4.2.3.1 Action step 1 of action cycle 3 of phase 2: Refine the drafted Key Performance Indicators (KPIs) of the Business Process Management (BPM):**

The drafted KPIs Taxonomy is reconsidered whether it should be adjusted for the additional refinement before taking action step 2 of action cycle 3 of phase 2. However, I do not find any additional refinement of the drafted KPIs Taxonomy of the BPM according to the inputs of the inputs of nine participants from the previous action step. Therefore, the drafted KPIs Taxonomy of the BPM can be used for the next action step.

#### **4.2.3.2 Rank the final list of the Key Performance Indicators (KPIs) Taxonomy and verify the reliability using AHP:**

This step consists of the process of using the statistical tool of the Analytic Hierarchy Process (AHP) to pairwise rank the drafted Key Performance Indicators (KPIs) in table B11 through the interview of the nine participants to be classified into three classes. (1) Class A (most important KPIs), (2) Class B (second most important KPIs), and (3) Class C (third most important KPIs).

The summary of all nine participants' pairwise approach evaluation hierarchy was calculated using the Analytical Hierarchy Process (AHP) analysis to seek the overall evaluation of the priority ranking and the reliability of the results. The summary approach evaluation hierarchy results of the Key Performance Indicators (KPIs) of the Business Process Management (BPM) can be presented as follows.

**Number of Participants: 9****Key Performance Indicators (KPIs) of the Business Process Management (BPM)**

- KPI 1) Net License Revenue per Employee
- KPI 2) Operating Expense per Total License Fees
- KPI 3) Customer Satisfaction Index
- KPI 4) License Renewal Time
- KPI 5) Productivity Improvement
- KPI 6) Ontime License Service Process
- KPI 7) Investment in Process Innovation per License Revenue
- KPI 8) Employee Satisfaction Index
- KPI 9) Suggested Improvement per Employee

**Table 4.57** Implementation Index & Standard deviation of Key Performance Indicators (KPIs) of the Business Process Management (BPM) of 9 participants

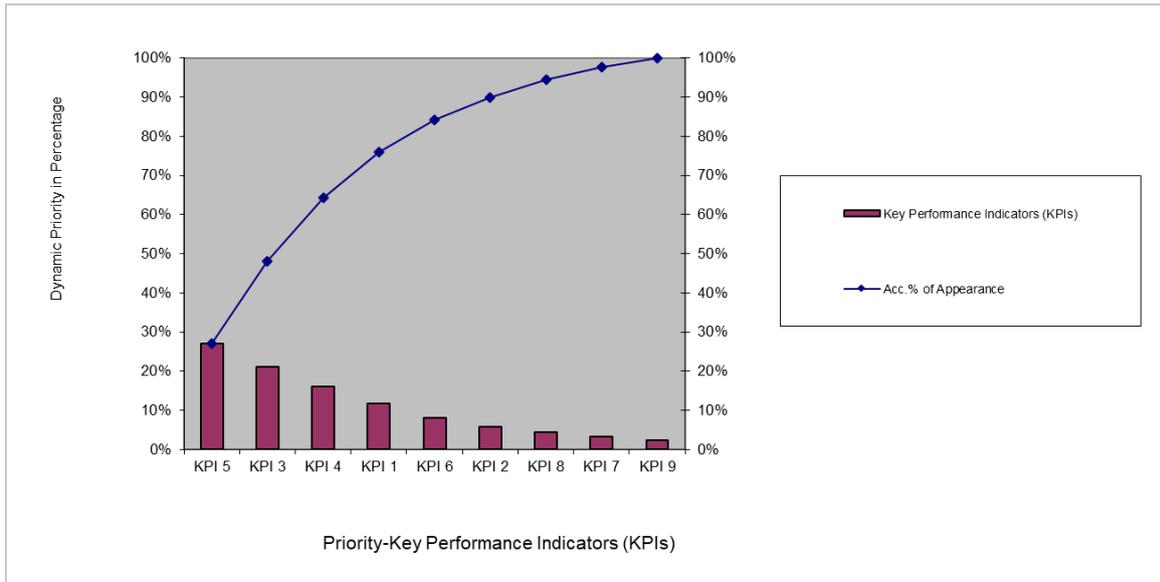
Participants	KPI1	KPI2	KPI3	KPI4	KPI5	KPI6	KPI7	KPI8	KPI9
Participant no.1	0.11	0.06	0.21	0.16	0.27	0.09	0.03	0.05	0.02
Participant no.2	0.13	0.07	0.20	0.18	0.19	0.08	0.05	0.05	0.03
Participant no.3	0.11	0.06	0.21	0.16	0.28	0.08	0.03	0.04	0.02
Participant no.4	0.11	0.06	0.21	0.16	0.29	0.08	0.03	0.04	0.02
Participant no.5	0.11	0.06	0.20	0.16	0.28	0.08	0.03	0.05	0.02
Participant no.6	0.11	0.07	0.21	0.16	0.27	0.08	0.03	0.04	0.02
Participant no.7	0.13	0.05	0.20	0.17	0.28	0.07	0.03	0.04	0.02
Participant no.8	0.12	0.05	0.22	0.15	0.28	0.08	0.03	0.05	0.02
Participant no.9	0.13	0.06	0.20	0.15	0.28	0.08	0.03	0.04	0.02
Mean	0.12	0.06	0.21	0.16	0.27	0.08	0.03	0.05	0.02
Std Deviation	0.01	0.01	0.01	0.01	0.03	0.00	0.01	0.00	0.00
Coefficient of Variation	6%	12%	4%	6%	11%	5%	21%	7%	17%
Geometric Mean	0.12	0.06	0.21	0.16	0.27	0.08	0.03	0.05	0.02
Priorities									
IMPL	0.06	0.12	0.04	0.07	0.11	0.05	0.22	0.07	0.17

**Table 4.58** The Key Performance Indicators (KPIs) Priorities according to the Dynamic Hierarchy among 9 Participants

<b>Key Performance Indicators (KPIs)</b>	<b>% of Appearance</b>	<b>Acc.%of Appearance</b>
KPI 5	27%	27%
KPI 3	21%	48%
KPI 4	16%	64%
KPI 1	12%	76%
KPI 6	8%	84%
KPI 2	6%	90%
KPI 8	5%	94%
KPI 7	3%	98%
KPI 9	2%	100%
Summary	100%	
Consistency Ratio	0.5%	

The results of the implementation index (IMPL) of Key Performance Indicators (KPIs) of the Business Process Management (BPM) from table 4.57 is between 0.05 to 0.22, which is less than 1.0; therefore, this is considered to be a very acceptable level (Takala, 2002).

The pairwise comparison results of the Key Performance Indicators (KPIs) of the Business Process Management (BPM) from the participants number 1 to 9 were measured for their reliability. Saaty (2001) suggests that the reliability of the pairwise comparison result can be measured from the consistency ratio using the Hierarchical Analytical Process (AHP), in which a consistency ratio of less than 5% is considered as a good consistency, and a consistency ratio of less than 20% is considered as an acceptable result. According to the summary the consistency ratio result of the participants number 1 to 9 from table 4.61 is 0.5%, which was lower than 5%; therefore, the result is good consistency.



**Figure 4.48** Priority Ranking of the Key Performance Indicators (KPIs) of 9 participants

Moreover, table 4.58 and figure 4.48 shows that the Class A:KPIs (most important) Key Performance Indicators (KPIs) consist of KPI5 (Productivity Improvement), KPI3 (Customer Satisfaction Index), and KPI4 (License Renewal Time). These Key Performance Indicators (KPIs) are classified to be the most important (>16%), for which continuous monitoring and corrective actions must take place in order to achieve the goals and objectives. The Class B:KPIs (second most important) has score between 6% - 12% and consists of KPI1 (Net License Revenue per Employee), KPI6 (Ontime License Service Process), and KPI2 (Operating Expense per Total License Fees), which the organisation must keep monitoring regularly to integrate with Class A:KPIs and Class C:KPIs. Finally, Class C:KPIs is the third most important Key Performance Indicators (KPIs), these consist of KPI8 (Employee Satisfaction Index), KPI7 (Investment in Process Innovation per License Revenue), and KPI9 (Suggested Improvement per Employee), and are considered as the supportive KPIs of Class A and Class B Key Performance Indicators (KPIs) for which the organisation should monitor as supportive or long term tracking.

#### 4.2.3.3 Action step 3 of action cycle 3 of phase 2: Develop the final Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM):

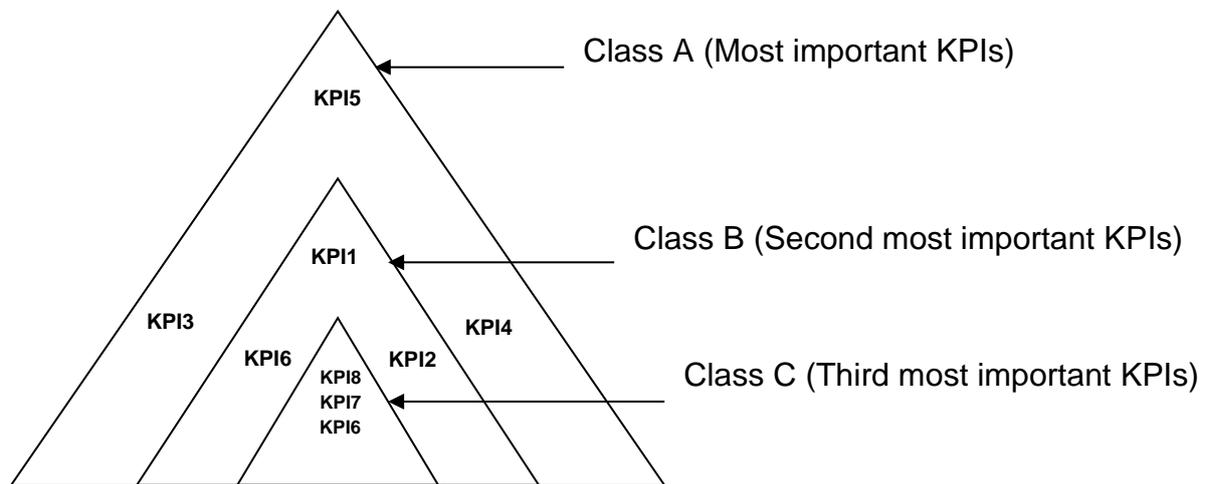
This step consists of using the results of action step 2 to further develop the final Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) of the newly combined broadcasting and telecommunication licensing bureau of the NBTC and prioritize the focus on the highly important KPIs, moderately important KPIs and generally important KPIs respectively.

The final Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) of the Office of The National Broadcasting and Telecommunications Commission (NBTC) can be seen in table 4.59.

**Table 4.59** The final Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) of the Office of The National Broadcasting and Telecommunications Commission (NBTC)

<b>Performance Focused Area</b>	<b>KPIs Categories</b>	<b>Key Performance Indicators (KPIs)</b>
<b>Business Process Management (BPM)</b>	<b>Class A KPIs</b>	KPI 5 Productivity Improvement
		KPI 3 Customer Satisfaction Index
		KPI 4 License Renewal Time
	<b>Class B KPIs</b>	KPI 1 Net License Revenue per Employee
		KPI 6 Ontime License Service Process
		KPI 2 Operating Expense per Total License Fees
	<b>Class C KPIs</b>	KPI 8 Employee Satisfaction Index
		KPI 7 Investment in Process Innovation per License Revenue
		CSF 6 Organisational Structure

The Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) can also be presented in the classification of the Sand Cone Model, in which the most important KPIs must be on the outside layer as they must be visible (Ferdows and de Meyer, 1990). This can be shown in figure 4.49.



**Figure 4.49** Sand Cond Model of Key Performance Indicators (KPIs) Taxonomy of Business Process Management (BPM) of the NBTC

#### 4.2.3.4 Reflection and sense making of action cycle 3 of phase 2:

The nine participants pairwise to rank the priority of KPIs from the drafted KPIs Taxonomy using the Analytic Hierarchy Process (AHP). The priority ranking of the KPIs generates three classes of the KPIs, which are (1) Class A (most important KPIs), (2) Class B (second most important KPIs), and (3) Class C (third most important KPIs). The final Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) is developed as shows in table 4.62. I think that the key performance of the business processes is very critical to measure as well as to monitor the actual performance compared with the performance target. Therefore, the KPIs Taxonomy of the BPM is considered very useful for the BPM of the NBTC. In addition, the priority ranking of the KPIs enables the NBTC to enhance the quality of its decision making to allocate time and limited resources to the most important KPIs, which is one of the most critical factors for successful BPM.

### 4.3 Summary

Chapter four consists of two phases: (1) development of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management, and (2) development of the new redesign of the business processes of the Business Process Management (BPM), as well as development of the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM). This action research mainly focuses on the new combined broadcasting and telecommunications licensing bureau of the NBTC.

The final CSFs Taxonomy of the Organisational Change Management consists of four categorized factors, which are (1) organisational CSFs, (2) human capital CSFs, (3) operations CSFs, and (4) technology CSFs.

The new redesign of the business processes of the BPM integrates both relevant external and internal processes into the central business process, which is called "License One System". The new redesign business processes of the BPM show it can improve the efficiency, effectiveness and productivity of the BPM of the newly combined broadcasting and telecommunications licensing bureau of the NBTC.

The final KPIs Taxonomy of the BPM is also developed to measure and monitor the business processes' performance of the BPM, which is very useful for the NBTC to track the actual performance of the BPM as well as to take corrective actions if the performance targets cannot accomplish.

I think that the research results are very useful for me as the top executives of the NBTC to have both Taxonomies in place, which I can allocate time and essential resources mainly to the most important areas to enhance the organisational productivity and key performance results.

The next chapter five aims to evaluate the outcome of the action research that is conducted in this chapter four.

## **CHAPTER 5**

# **EVALUATIONS OF OUTCOME**

In this chapter, the research outcome of the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management, redesign of the new business process of the Business Process Management (BPM) and the final Key Performance Indicators (KPIs) of the Business Process Management (BPM) of the new combined licensing bureau of the Office of the National Broadcasting and Telecommunications Commission (NBTC) are evaluated and validated through the relevant literature review as well as the in-depth and semi-structured interview of nine participants for three objectives 1) evaluation the outcome to the relevant literature review, 2) validation of acceptability and usefulness of the proposed taxonomies, and 3) validation of the contributions to relevant management concepts.

### **5.1 Evaluation of the outcomes of the study**

#### **5.1.1 Evaluation of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management**

The outcome of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the new combined licensing bureau of the Office of the National Broadcasting and Telecommunications Commission (NBTC) consists of four categorized factors include (1) Organisational Critical Success Factors (CSFs), (2) Human Capital Critical Success Factors (CSFs), (3) Operations Critical Success Factors (CSFs), and (4) Technology Critical Success Factors (CSFs).

In addition, the Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management is developed from the four categorized CSFs with three classes. These three classes of the Organisational Critical Success Factors (CSFs) are classified to be class A:CSFs (most important) has the score >15%, consists of CSF1 (Change Vision and Mission), CSF7 (Organisational Culture), and CSF3 (Organisational Change Strategy), for which continuous monitoring and corrective action must take place in order to achieve the goals and objectives. The

Class B:CSFs (second most important) has a score between 7% and 11%, consisting of CSF4 (Organisational Infrastructure), CSF2 (Change Goals and Objectives), and CSF3 (Organisational Change Strategy), for which the organisation must keep monitoring regularly to integrate with Class A:CSFs and Class C:CSFs. Finally, Class C:CSFs is the third most important of the Organisational CSFs, which consist of CSF9 (Interorganisational Integration), CSF5 (Performance and Reward System), and CSF6 (Organisational Structure), which are considered as the supportive CSFs of Class A and Class B Organisational Critical Success Factors (CSFs) for which the organisation should monitor as supportive or long-term tracking. The outcome of class A of the Organisational CSFs consists of CSF1 (Change Vision and Mission) is aligned with the research study of Fritzenschaft (2011) that the highest ranking of the CSFs of the organisational change is defined objectives and vision. The CSF7 (Organisational Culture) is aligned with Farhan, et al. (2018) who argue that the top three of the organisational factors is cooperative organisational culture. The CSF3 (Organisational Change Strategy) is similar to the research study of Farhan, et al. (2018). The Human Capital Critical Success Factors (CSFs) can be grouped into three classes, in which Class A (most important) consists of CSF10 (Leadership Commitment and Support), CSF18 (Sense of Organisational Change Urgency), CSF13 (Employee Engagement) are aligned with the study of Farhan, et al (2018) and Fritzenschaft (2011) that revealed the research study of the people CSFs of the organisational change management consists of leadership, create a sense of urgency and employee engagement . The Class A (most important) of the Operations Critical Success Factors (CSFs) consists of CSF19 (Operational Change Strategy), CSF21 (Business Process Management: BPM), and CSF23 (Organisational Strategic Alignment) are aligned to the study of Farhan, et al (2018), Chow and Cao (2008) and Fritzenschaft (2011) that the Operations CSFs of the organisational change management consists of Operational Change Strategy, Business Process Management (BPM) and Organisational Strategic Alignment. Finally, the Class A (most important) of the Technology CSFs consists of CSF28 (Big Data Technology), CSF29 (Business Intelligence: BI Technology), CSF30 (Digital Government Technology) is similar to the study of Farhan, et al (2018), Chow and Cao (2008), Stankovik, et al. (2018) and Fritzenschaft (2011) that the CSFs of the Technology CSFs of the organisational change management consists of Big Data Technology, Business Intelligence (BI), and Digital Government Technology.

I find that the evaluation of the final Critical Success Factors (CSFs) of the Organisational Change Management is aligned to the relevant literature review of the Critical Success Factors (CSFs) of the Organisational Change Management. Therefore, the outcome of this part is validated and reliable.

### **5.1.2 Evaluation of the redesign of the business processes of the Business Process Management (BPM)**

The outcome of the redesign of the existing business processes of the frequency spectrum licensing of the new combined licensing bureau of the NBTC that aims to solve the ineffectiveness and the inefficiency of the existing business processes can be presented in figure 4.47 as the following details.

(1) Design and develop the frequency spectrum licensing application via an electronic license (License One Platform Conceptual Design)

(2) Link the common data bases with other relevant government agencies to share the common online data bases of the required supporting application documents for the frequency spectrum licensing approval for both new license applications and renewal applications.

(3) Develop an electronic or digital system for the application for license submission process.

(4) Develop an alert and monitoring systems to track the progress and results of the license one application.

(5) Develop the license fee payment through the electronic payment system (e-payment)

(6) Develop the standard evaluation system of the electronic license one system.

I find that the redesign of the business processes of the BPM of the new combined licensing bureau of the NBTC applies the digital technology to create the new information technology (IT) to link the NBTC data base with other relevant governmental offices as well as to shorten the duplicated business processes through combining the broadcasting license and telecommunications license into one license

that the operators can use only the new single license for both broadcasting and telecommunications businesses. The new redesign of the business processes of the BPM of the NBTC can enhance the business process cycle time, productivity, speed, operating cost, time is aligned to Heizer and Render (2017) argue that the effective business process redesign must achieve the continuous performance improvement includes cost, time, productivity, and customer value throughout the organisation.

### **5.1.3 Evaluation of the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM)**

The outcome of the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) of the new combined licensing bureau of the NBTC consists of Class A:KPIs (most important) Key Performance Indicators (KPIs) consist of KPI5 (Productivity Improvement), KPI3 (Customer Satisfaction Index), and KPI4 (License Renewal Time). These Key Performance Indicators (KPIs) are classified to be class A:KPIs (most important) has score >16%, for which continuous monitoring and corrective actions must take place in order to achieve the goals and objectives. The Class B:KPIs (second most important) has score between 6% - 12% and consists of KPI1 (Net License Revenue per Employee), KPI6 (On-time License Service Process), and KPI2 (Operating Expense per Total License Fees), which the organisation must keep monitoring regularly to integrate with Class A:KPIs and Class C:KPIs. Finally, Class C:KPIs is the third most important Key Performance Indicators (KPIs), these consist of KPI8 (Employee Satisfaction Index), KPI7 (Investment in Process Innovation per License Revenue), and KPI9 (Suggested Improvement per Employee), and are considered as the supportive KPIs of Class A and Class B Key Performance Indicators (KPIs) for which the organisation should monitor as supportive or long term tracking. I find that class A (KPIs) is the most important KPIs that the NBTC must monitor and corrective actions closely in order to achieve the goals and objectives. The KPIs Taxonomy outcome is aligned Kotler and Kaplan (1992) that propose the KPIs of the operational perspective includes Productivity Improvement, Customer Satisfaction Index, Operational Cycle Time, Net Revenue per Employee, On-time Delivery, Operating Expense per Transaction, Employee Satisfaction Index, Process Innovation Investment, and Suggested Improvement per Employee.

## **5.2 Validation of acceptability and usefulness of the proposed taxonomies**

### **5.2.1 Validation of acceptability and usefulness of the final Critical Success Factors (CSFs) of the Organisational Change Management**

The validation of the acceptability and usefulness of the final Critical Success Factors (CSFs) of the Organisational Change Management is conducted at the action step 1 of action cycle 3 of phase 1, which can be described as follows.

The semi-structured and in-depth interview of nine participants is conducted to seek for their inputs to validate the acceptability and usefulness of the final CSFs Taxonomy of the Organisational Change Management. The interview questions consist of two parts (appendix B). Part A consists of 5 questions to seek their inputs using Likert scale of 1 to 5. Part B consists of 2 open-ended questions to seek for their additional inputs for the final CSFs Taxonomy.

The results of the semi-structured and in-depth interview of part A shows that the initial results are perceived to be acceptable and useful by the group of nine participants. The interview followed five questions as well as being open for additional comments from the participants, as in table 5.1, for the acceptability and usefulness of the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management. The nine participants are interviewed with first question to self-evaluate their knowledge of the CSFs Taxonomy of the Organisational Management because it is essential to ensure that all nine participants have enough knowledge to validate the research results. The answers of question number of nine participants show that they have considerable knowledge of the Critical Success Factors (CSFs) of the Organisational Change Management, with an average score of 4.44 from the scale of 1 to 5, the standard deviation was 0.53, which is considered as of high consistency. The CSFs Taxonomy is evaluated to be appropriate and applicable for the Organisational Change Management of the NBTC. The average score is 4.78, and the standard deviation is 0.44, which is considered as of high consistency. The Critical Success Factors (CSFs) Taxonomy is validated to be valuable for implementing the organisational change plans, with an average score of 4.67, the standard deviation is 0.50, which is considered as of high consistency. The Critical Success Factors (CSFs)

Taxonomy is validated to enhance the quality decisions to be more focused and more precise, and to help the organisation achieve its goals and objectives. with an average score of 4.56, the standard deviation is 0.55, which is considered as of high consistency. Finally, the Critical Success Factors (CSFs) Taxonomy is validated to provide knowledge of organisational change management so as to sustain the future organisational change capability and success, with an average score of 4.78, the standard deviation is 0.44, which is considered as high consistency.

The overall outcome of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management is acceptable and useful, which is aligned to Rockart (1979) argues that Critical Success Factors (CSFs) are used to determine the critical information for top management to make quality decisions to manage the business effectively and successfully. In addition, Fritzenschaft (2011) argues that the leaders who is leading successful organisational change accept that there are different CSFs and use them to develop the most suitable framework to transform change.

**Table 5.1** The Validation of the Acceptability and Usefulness of the Critical Success Factors (CSFs) of the Organisational Change Management from Nine Participants

Questions	(Strongly disagree =1-----> Strongly agree = 5)									Mean	Std. Dev.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		
1. Please rank your knowledge of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management.	4	5	4	4	5	4	5	5	4	4.44	0.53
2. The CSFs Taxonomy is appropriate and applicable for the organisational change management of the NBTC.	5	4	5	5	5	4	5	5	5	4.78	0.44
3. The CSFs Taxonomy is valuable for implementing the organisational change plans.	4	5	5	4	5	5	4	5	5	4.67	0.50
4. The CSFs Taxonomy enhances the quality decision to become focused and precise, which helps the organisation achieve its goals and objectives.	5	5	4	5	4	5	4	4	5	4.56	0.53
5. The CSFs Taxonomy provides the knowledge of organisational change management to sustain the future organisational change capability and success.	4	5	5	5	4	5	5	5	5	4.78	0.44
Overall Mean/Standard deviation										4.65	0.49

The answers from the in-depth interview of nine participants in part B can be summarized as follows.

1. Which contexts of the Final Critical Success Factors (CSFs) of the Organisational Change Management are not acceptable for you, such as ranked categorized factors ? Please feel free to address these concerns.

The answers of nine participants are the same direction, which there is no context of the final CSFs Taxonomy of the Organisational Change Management that is not acceptable. The detailed inputs of nine participants can be presented in table 5.2 as follow.

**Table 5.2** The inputs of nine participants for the acceptability of the Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management

Participants	<b>1. Which contexts of the Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management are not acceptable for you, such as ranked categorized factors ? Please feel free to address these concerns.</b>
1	“I do accept the Final Critical Success Factors (CSFs) Taxonomy and I do have any additional suggestions.”
2	“I accept the Final Critical Success Factors (CSFs) Taxonomy with no doubt.”
3	“The Final Critical Success Factors (CSFs) Taxonomy looks excellent.”
4	“The Final Critical Success Factors (CSFs) Taxonomy consists of the relevant and essential factors for the organisational change management .”
5	“I agree with the Final Critical Success Factors (CSFs) Taxonomy without further comments on that.”
6	“The Final Critical Success Factors (CSFs) Taxonomy is acceptable, but the NBTC should modify it for the future environmental factors that might be changed.”
7	“The Final Critical Success Factors (CSFs) Taxonomy is already perfect, and I have no addition modification for them.”
8	“The Final Critical Success Factors (CSFs) Taxonomy is suitable for the current disruptive technology convergence of broadcasting and telecommunications environment, and I have no additional comments.”
9	“The Final Critical Success Factors (CSFs) Taxonomy is suitable for the NBTC and I have no further suggestions.”

2. Which parts of the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management do you want to replace or modify?

The overall inputs of nine participants are the same direction that they do not want to replace or modify any parts of the final CSFs Taxonomy of the Organisational Change Management. The detailed inputs of nine participants can be presented in table 5.3 as follow.

**Table 5.3** The inputs of nine participants to replace or modify the Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management

Participants	<b>2. Which parts of the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management do you want to replace or modify?</b>
1	"I do accept the Final Critical Success Factors (CSFs) Taxonomy and I do not want to replace or modify and parts
2	"I accept the Final Critical Success Factors (CSFs) Taxonomy without replacement or modification."
3	"The Final Critical Success Factors (CSFs) Taxonomy is totally acceptable for me."
4	"The Final Critical Success Factors (CSFs) Taxonomy consists of the relevant and essential factors, and I have no intention to replace or modify any parts ."
5	"I agree with the Final Critical Success Factors (CSFs) Taxonomy without any additional modification for me."
6	"The Final Critical Success Factors (CSFs) Taxonomy is acceptable for now but might have to replace or modify when the environment is changed in the future."
7	"The Final Critical Success Factors (CSFs) Taxonomy is already perfect, and I have no addition modification for them."
8	"The Final Critical Success Factors (CSFs) Taxonomy is suitable, and I have no more intention to replace or modify any parts.
9	"The Final Critical Success Factors (CSFs) Taxonomy is suitable, and I do not want to replace or modify any parts

I agree with nine participants that the final CSFs Taxonomy of the Organisational Change Management is acceptable and useful for the Organisational Change Management and particularly for the NBTC, which is similar to Rockart (1979) and Fritzenschaft (2011) argue that Critical Success Factors (CSFs) are for making quality decisions to develop the most suitable framework to manage the effective and successful business leading successful organisational change. In addition, I believe that I can focus on the CSFs Taxonomy to build up the essential knowledge as well as skill sets that are required to implement the organisational change successfully. I also believe that the organisational change capability must be identified and be developed continuously in order to cope with the dynamic changing environment.

### **5.2.2 Validation of acceptability and usefulness of the final Key Performance Indicators (KPIs) of the Business Process Management (BPM)**

The validation of the acceptability and usefulness of the final Key Performance Indicators (KPIs) of the Business Process Management (BPM) is conducted at the action step 1 of action cycle 4 of phase 2, which can be summarized as follows.

The semi-structured and in-depth interview of nine participants is conducted to seek for their inputs to validate the acceptability and usefulness of the final KPIs Taxonomy of the Business Process Management (BPM). The interview questions consist of two parts (appendix B).

The semi-structure interview of part A follows five questions as well as being open for additional comments from the participants, as in table 5.4, for the acceptability and the usefulness of the Key Performance Indicators (KPIs) Taxonomy of Business Process Management (BPM). The nine participants have considerable knowledge of the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM), with an average score of 4.44 from a scale of 1 to 5, the standard deviation is 0.53, which is considered as of high consistency. The Key Performance Indicators (KPIs) Taxonomy is validated to help develop the central knowledge for the entire organisations for future Organisational Change Knowledge Capability with an average score of 4.78, the standard deviation was 0.44, which is considered as of high

consistency. The Key Performance Indicators (KPIs) Taxonomy are validated to be valuable for implementing the Business Process Management (BPM) action plans, with an average score of 4.56, the standard deviation is 0.73, and this is considered as of high consistency. The Key Performance Indicators (KPIs) Taxonomy is validated to enhance the quality decision to be more focused and more precise, this will help the BPM achieve its goals and objectives, the average score is 4.67, the standard deviation is 0.50, which is considered as of high consistency. Finally, the KPIs Taxonomy is validated to provide knowledge of Business Process Management (BPM) to sustain the future Business Process Management (BPM) capability and success, with an average score of 4.89, the standard deviation is 0.33, which is considered as of high consistency.

**Table 5.4** The Validation of the Acceptability and Usefulness of the Key Performance Indicators (KPIs) of the Business Process Management (BPM) from nine Participants

Questions	(Strongly disagree =1-----> Strongly agree = 5)									Mean	Std. Dev.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		
1. Please rank your knowledge of the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM).	5	5	4	5	5	4	5	4	5	4.67	0.50
2. The KPIs Taxonomy is appropriate and applicable for the Business Process Management (BPM) of the NBTC.	5	4	5	5	5	4	5	5	5	4.78	0.44
3. The KPIs Taxonomy is valuable for implementing the Business Process Management (BPM) action plans.	4	5	5	4	5	5	3	5	5	4.56	0.73
4. The KPIs Taxonomy enhances the quality decisions to become focused and precise, which helps the BPM achieve its goals and objectives.	5	5	4	4	4	5	4	5	5	4.56	0.53
5. The KPIs Taxonomy provides the knowledge of Business Process Management (BPM) to sustain the future BPM capability and success.	5	5	5	5	5	4	5	5	5	4.89	0.33
Overall Mean/Standard deviation										4.69	0.51

The answers from the in-depth interview of nine participants in part B can be summarized as follows.

1. Which contexts of the Key Performance Indicators (KPIs) of the Business Process Management (BPM) are not acceptable to you, such as Key Performance Indicators (KPIs)? Please feel free to address this and make comments.

The answers of nine participants are the same direction, which there is no context of the final KPIs Taxonomy of the Business Process Management (BPM) that is not acceptable. The detailed inputs of nine participants can be presented in table 5.5 as follow.

**Table 5.5** The inputs of nine participants for the acceptability of the Final Key Performance Indicators (KPIs) of the Business Process Management (BPM)

Participants	<b>1. Which contexts of the Key Performance Indicators (KPIs) of the Business Process Management (BPM) are not acceptable to you, such as Key Performance Indicators (KPIs)? Please feel free to address this and make comments.</b>
1	“I do accept the Key Performance Indicators (KPIs) of the Business Process Management (BPM) and I do have any additional suggestions.”
2	“I accept the Key Performance Indicators (KPIs) of the Business Process Management (BPM) with no doubt.”
3	“The Key Performance Indicators (KPIs) of the Business Process Management (BPM) looks excellent.”
4	“The Key Performance Indicators (KPIs) of the Business Process Management (BPM) consists of the relevant and essential factors for the organisational change management .”
5	“I agree with the Key Performance Indicators (KPIs) of the Business Process Management (BPM) without further comments on that.”
6	“The Key Performance Indicators (KPIs) of the Business Process Management (BPM) is acceptable, but the NBTC should modify it for the future environmental factors that might be changed.”
7	“The Key Performance Indicators (KPIs) of the Business Process Management (BPM) is already perfect, and I have no addition modification for them.”
8	“The Key Performance Indicators (KPIs) of the Business Process Management (BPM) is suitable for the current disruptive technology convergence of broadcasting and telecommunications environment, and I have no additional comments.”
9	“The Key Performance Indicators (KPIs) of the Business Process Management (BPM) is suitable for the NBTC and I have no further suggestions.”

2. Which parts of The Key Performance Indicators (KPIs) of the Business Process Management (BPM) do you want to replace or modify?

The overall inputs of nine participants are the same direction that they do not want to replace or modify any parts of The Key Performance Indicators (KPIs) of the Business Process Management (BPM). The detailed inputs of nine participants can be presented in table 5.6 as follow.

**Table 5.6** The inputs of nine participants to replace or modify the Final Key Performance Indicators (KPIs) of the Business Process Management (BPM)

Participants	<b>2. Which parts of The Key Performance Indicators (KPIs) of the Business Process Management (BPM) do you want to replace or modify?</b>
1	"I do accept The Key Performance Indicators (KPIs) of the Business Process Management (BPM) Taxonomy and I do not want to replace or modify and parts
2	"I accept The Key Performance Indicators (KPIs) of the Business Process Management (BPM) without replacement or modification."
3	"The Key Performance Indicators (KPIs) of the Business Process Management (BPM) is totally acceptable for me, and I do not want to replace or modify it further."
4	"The Key Performance Indicators (KPIs) of the Business Process Management (BPM) consists of the relevant and essential KPIs, and I have no intention to replace or modify any parts ."
5	"I agree with the Key Performance Indicators (KPIs) of the Business Process Management (BPM) without any additional modification for me."
6	"The Key Performance Indicators (KPIs) of the Business Process Management (BPM) is acceptable for now but might have to replace or modify when the environment is changed in the future."
7	"The Key Performance Indicators (KPIs) of the Business Process Management (BPM) is already perfect, and I have no addition modification for them."
8	"The Key Performance Indicators (KPIs) of the Business Process Management (BPM) is suitable, and I have no more intention to replace or modify any parts.
9	"The Final Critical Success Factors (CSFs) Taxonomy is suitable, and I do not want to replace or modify any parts

I agree with nine participants that the Key Performance Indicators (KPIs) of the Business Process Management (BPM) is acceptable and useful for the Business Process Management (BPM) and particularly for the NBTC, which is aligned to Kaplan and Norton (1996) argue that the Key Performance Indicators (KPIs) is very critical for the successful organisations to apply it to measure and manage their operational perspective in order to excel their operations. I also believe that I can focus on the KPIs Taxonomy to build up the essential knowledge as well as skill sets that are required to implement the Business Process Management (BPM) successfully. I also believe that the Business Process Management (BPM) should be monitored closely and continuously in order to support the dynamic change of the Organisational Change Management that must adjust to the disruptive technology convergence of broadcasting and telecommunications.

### **5.3 Validation of contributions of the proposed taxonomies to relevant management concepts**

The main purpose of this step is to validate the contributions of the proposed final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and the Key Performance Indicators (KPIs) of the Business Process Management (BPM) of the Office of the National Broadcasting and Telecommunications Commission (NBTC) according to the relevant management concepts, including Organisational Change Management and Knowledge Management (KM), which can be summarized as follows.

#### **5.3.1 Validation of contributions of the proposed taxonomies to Organisational Change Management concepts**

The in-depth and semi-structured interview of the nine participants is used to validate the contributions of the proposed taxonomies to the Organisational Change Management concepts. The interview questions consist of two parts (appendix B). Part A consists of 1 open-ended question to seek for their knowledge of the organisational change management. Part B consists of 5 questions to seek their inputs using Likert

scale of 1 to 5 for the contributions of the proposed two taxonomies to the Organisational Change Management concepts.

The answers from the in-depth interview of nine participants in part A can be summarized as follows.

1. Have you known and experienced Organisational Change Management? What is the definition of Organisational Change Management, according to your ideas?

The answers of nine participants are the same direction that they have knowledge and experience of the Organisational Change Management, and they provide the definition of the organisational change management is a framework for managing the effect of new business processes, changes in organizational structure or cultural changes within an organisation, which is aligned to Shein (2004) argues that the organisational change management is defined as the managing of new pattern of actions, belief, and attitudes among substantial segments of an organisation. In addition, Kotler (2011) argues that organisational change management proposes that considers the full organization and what needs to change, while change management may be used solely to refer to how people and teams are affected by such organizational transition. It deals with many different disciplines, from behavioural and social sciences to information technology and business solutions. The detailed inputs of nine participants can be presented in table 5.7 as follow.

**Table 5.7** The inputs of nine participants of their known and experienced Organisational Change Management

Participants	1. Have you known and experienced Organisational Change Management? What is the definition of Organisational Change Management, according to your ideas?
1	Yes, I have. "Organisational Change Management is defined as how to manage the change throughout the organisation successfully through the new ways of doing includes business process redesign, change leadership and employee engagement ."
2	Yes, I have. "Organisational Change Management is defined as managing the new change that affected from the new technology includes new business processes, and new business models."
3	Yes, I have. "Organisational Change Management is defined as managing the new organisational structure and new organisational culture to cope with changing business environment."
4	Yes, I have. "Organisational Change Management is defined as handling the organisational change according to the impacts of the external environment includes new enterprise resource planning and new information technology system ."
5	Yes, I have. "Organisational Change Management is defined as doing the right things of the overall operations to fit with the new environment."
6	Yes, I have. "Organisational Change Management is defined as implementing the new system integration to enhance the organisational competitiveness ."
7	Yes, I have. "Organisational Change Management is defined as leading the new organisational approaches to fit the disruptive technology."
8	Yes, I have. "Organisational Change Management is defined as creating and implementing the new organisational strategy to manage the organisational change effectively."
9	Yes, I have. "Organisational Change Management is defined as building and nurturing the change capability continuously to manage the organisational change successfully and sustainably."

The results of the semi-structured interview of part B are shown in table 5.8. First, the taxonomies are validated to provide benefits to the Organisational Change Management. the average score is 4.44, and the standard deviation is 0.73, this is considered as high consistency. Second, the taxonomies are validated to be beneficial for the organisation to analyze the change impacts and to further develop the organisational change strategy effectively, the average score is 4.56, and the standard deviation is 0.53, this is considered as of high consistency. Third, the taxonomies are validated to provide the benefits for the top management to predict and prepare for future change more precisely, the average score is 4.33, and the standard deviation was 0.87, which is considered as of high consistency. Fourth, the taxonomies are validated to provide the organisation to seek opportunities from the organisational change, the average score is 4.67, and the standard deviation is 0.50, which is considered as of high consistency. Finally, the taxonomies are validated to provide the organisation to change its operation to be more competitive, the average score is 4.78, and the standard deviation is 0.44, which is considered as of high consistency. The outcome is aligned to Fritzenschaft (2011) argues that the Critical Success Factors (CSFs) the successful organisational change management can take the benefits of the CSFs to develop the most suitable framework to transform to lead the organisational change more effectively. In addition, Binci (2020) argues that the Key Performance Indicators (KPIs) of the Business Process Management (BPM) is a management tool to measure the business process performance according to the organisational change vision and objectives, it is critical for the organisation change team to keep monitoring, evaluating, and taking corrective actions of the real performance if it deviates from the expected KPIs targets. I also agree that both taxonomies are very useful and high beneficial for me to apply them to organisational change management at the NBTC more effectively and successfully.

**Table 5.8** The Validation and Contributions to the Organisational Change Management of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM)

Questions	(Strongly disagree =1-----> Strongly agree = 5)									Mean	Std. Dev.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		
1. The Taxonomy provides benefits to the Organisational Change Management	3	4	5	4	4	5	5	5	5	4.44	0.73
2. The Taxonomy is beneficial for the organisation to analyze the impact of change and to further develop the organisational change strategy effectively.	5	5	4	5	5	4	4	4	5	4.56	0.53
3. The Taxonomy provides the benefits for the top management to predict and prepare for future change more precisely.	4	5	5	3	5	4	3	5	5	4.33	0.87
4. The Taxonomy provides the organisation to seek opportunities from the organisational change.	4	5	5	5	5	5	4	5	4	4.67	0.50
5. The Taxonomy provides the organisation to change the organisation to be more competitive.	5	5	5	4	5	4	5	5	5	4.78	0.44
Overall Mean/Standard deviation										4.56	0.61

### **5.3.2 Validation of contributions of the proposed taxonomies to Knowledge Management (KM) concepts**

The in-depth and semi-structured interview of the nine participants is used to validate the contributions of the proposed taxonomies to the Knowledge Management (KM) concepts. The interview questions consist of two parts (appendix B). Part A consists of 1 open-ended question to seek for their knowledge of the Knowledge Management (KM). Part B consists of 5 questions of the semi-structured interview to seek their inputs using Likert scale of 1 to 5 for the contributions of the proposed two taxonomies to the Knowledge Management (KM) concepts.

The answers from the in-depth interview of nine participants in part A can be summarized as follows.

1. Have you had knowledge and experience of Knowledge Management (KM)? What is the definition of Knowledge Management (KM) according to your ideas?

The answers of nine participants are the same direction that they have knowledge and experience of the Knowledge Management (KM), and they provide the definition of the Knowledge Management is the interdisciplinary process of creating, using, sharing, and maintaining an organization's information and knowledge to enhance the organisational competitive advantage. The definition of the Knowledge Management (KM) from the inputs of nine participants is aligned to Malhotra (2000) commends that Knowledge Management (KM) is apply knowledge to survive in a dynamic changing environment. The KM focuses on doing the right things rather than doing the things right. In addition, Award and Ghaziri (2004), state that knowledge management (KM) is a newly emerging, interdisciplinary business model that has knowledge within the framework of an organization as its focus. It is rooted in many disciplines, including business, economics, psychology, and information management. It is the ultimate competitive advantage for today's firm. Knowledge management involves people, technology, and processes in overlapping parts. Therefore, I find that all nine participants have knowledge and experience of Knowledge Management (KM).

The detailed inputs of nine participants can be presented in table 5.9 as follow.

**Table 5.9** The inputs of nine participants of their known and experienced Organisational Change Management

Participants	1. Have you had knowledge and experience of Knowledge Management (KM)? What is the definition of Knowledge Management (KM) according to your ideas?
1	Yes, I have. "Knowledge Management (KM) is defined as managing both tacit and explicit knowledge to share across the organisation."
2	Yes, I have. "Knowledge Management (KM) is defined as applying knowledge for the organisations to survive their businesses."
3	Yes, I have. "Knowledge Management (KM) is defined as the knowledge integration of the interdisciplinary knowledge concepts include business, economics, technology and social science ."
4	Yes, I have. "Knowledge Management (KM) is defined as the managing knowledge through acquiring and sharing among organisational members to the right things ."
5	Yes, I have. "Knowledge Management (KM) is defined as the continuous learning through acquiring and transferring knowledge through the information system."
6	Yes, I have. "Knowledge Management (KM) is defined as managing both tacit and explicit knowledge to advance their products and services through changing businesses process and organisational structure."
7	Yes, I have. "Knowledge Management (KM) is defined as managing knowledge through the combination of people, organisation and technology ."
8	Yes, I have. "Knowledge Management (KM) is defined as the process of creating, sharing, using and managing the knowledge and information of an organisation to sustain its business."
9	Yes, I have. "Knowledge Management (KM) is defined as Knowledge management is the process by which an enterprise gathers, organizes, shares and analyzes its knowledge in a way that is easily accessible to employees."

The results of the semi-structured interview of nine participants are shown in table 5.10. First, the taxonomies are validated to provide benefits for the Knowledge Management (KM) for the organisations to transfer the knowledge of the Organisational Change Management and Business Process Management (BPM), the average score was 4.22, the standard deviation is 0.83, which is considered as of high consistency. Second, the taxonomies are validated to help develop the central knowledge for the entire organisations for future Organisational Change Knowledge Capability, the average score was 4.33, and the standard deviation was 0.71, which was considered as of high consistency. Third, the taxonomies are validated that the knowledge development of the taxonomies enhances the ability to achieve the organisational goal and objectives, the average score is 4.56, and the standard deviation is 0.73, which is considered as of high consistency. Fourth, the taxonomies validated that the knowledge of the taxonomies enables the organisation to improve its capability to regulate as well as to promote the broadcasting and telecommunication industries, the average score is 4.67, and the standard deviation was 0.50, which was considered as of high consistency. Finally, the taxonomies validated that the knowledge of the taxonomies enhances the organisational productivity improvement. the average score is 4.56, and the standard deviation is 0.53, which is considered as of high consistency. The outcome from nine participants is aligned to Martensson (2000) supports that KM is considered as an important or essential factor for organisation to survive and maintain its competitive advantage as well as to cope with the external impacts through effective organisational change management. The outcome is also similar to Park and Kim (2015) argue that the successful organisational change implementation requires essential knowledge at all organisational level. Therefore, the organisation must ensure that their KM process encourages knowledge sharing across their organisation. In addition, the outcome is aligned to Schmid and Kern (2014) argue that the integration of BPM and KM enables the companies to enhance temporal, qualitative and cost of goods and services as well as to improve their innovative capacities. Petrovic et al. (2019) argues that the basic value creation factors, assets, and capital are decreasing their value tremendously, in contrast, the knowledge is growing significantly as the important factors for successful BPM. In addition, Meier and Weller (2012) argue that the successful BPM requires the critical knowledge to manage the business processes; therefore, the integration between BPM and KM provides the essential knowledge to succeed the BPM. Bitkowska (2020)

argues that the integration of BPM and KM can gain the benefit that the knowledge management processes through the identification, acquisition, documentation, and implementation using the BPM. Marjanovic and Freeze (2012) argue that the integration of BPM and Knowledge KM enhances the organisational sustainable competitive advantage through the knowledge gained during the ongoing business process design and implementation, which is considered critical for the organisation to survive and compete in the highly dynamic changing environment. I find that both taxonomies provide highly contributions to the Knowledge Management (KM), which I can use this knowledge to implement both Organisational Change Management and Business Process (BPM) more effectively and successfully.

**Table 5.10** The Validation of the Contributions to the Knowledge Management (KM) of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM)

Questions	(Strongly disagree =1-----> Strongly agree = 5)									Mean	Std. Dev.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		
1. The Taxonomy provides benefits for the Knowledge Management (KM) for the organisations to transfer the knowledge of the Organisational Change Management and Business Process Management (BPM).	5	4	4	5	3	4	3	5	5	4.22	0.83
2. The Taxonomy helps develop the central knowledge for the entire organisations for future Organisational Change Knowledge Capability.	5	5	4	3	5	4	5	4	4	4.33	0.71
3. The knowledge development of the Taxonomies enhances the ability to achieve the organisational goal and objectives.	4	5	5	3	5	4	5	5	5	4.56	0.73
4. The knowledge of the Taxonomies enables the organisation to improve its capability to regulate as well as to promote the broadcasting and telecommunication industries.	5	5	5	5	5	4	5	4	4	4.67	0.50
5. The knowledge of the Taxonomies enhances the organisational productivity improvement	5	4	5	4	5	4	5	4	5	4.56	0.53
Overall Mean/Standard deviation										4.47	0.66

## **5.4 Reflection and sense making of action cycle 3 of phase 1 and action cycle 4 of phase 2**

The reflection and sense making of action cycle 3 of phase 1 and action cycle 4 of phase 2 aims to reflect the research analysis results of the validation of the acceptability and usefulness of the two proposed taxonomies. In addition, the validation process also includes the contributions of the two proposed taxonomies to the relevant management concepts, which are Organisational Change Management and Knowledge Management (KM). The research analysis results show that the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management is acceptable and useful to the Organisational Change Management. The inputs of the in-depth interview of nine participants also shows that the final Key Performance Indicators (KPIs) of the Business Process Management (BPM) is acceptable and useful to the Business Process Management (BPM). I have learned from the in-depth interview with nine participants that the two proposed taxonomies are considered as management tools for me to use to allocate my time and essential resources according to the priority ranking of both CSFs and KPIs in order to manage the NBTC effectively and productively.

In addition, the validation of the contributions of both proposed taxonomies to the relevant management concepts highly shows contributions to both Organisational Change Management and Knowledge Management (KM). I have gained intensive knowledge during conducting this research study from both literature review and the inputs from the in-depth interview with nine participants, which I believed that I can apply this knowledge to both Organisational Change Management and Knowledge Management (KM) at the NBTC. I also believe that the action learning from this research study can enhance my ability to manage organisational change as well as business processes at my workplace more effectively.

## **CHAPTER 6**

# **CONCLUSIONS, REFLECTIONS, AND IMPLICATIONS**

The major objectives of this action research aim to achieve the answers to the research questions, which consists of 7 questions to cover to develop the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management, new redesign of the business processes of the Business Process Management (BPM), and Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM). The scope of the action research study focuses on the new combined broadcasting and telecommunications licensing bureau of the Office of the National Broadcasting and Telecommunications Commission (NBTC). The research questions also seek for the validation of the contributions of both taxonomies to the relevant management concepts, which are Organisational Change Management and Knowledge Management (KM).

The significance of reducing the failure of the organisational change implementation has several benefits. First, the successful organisational change implementation in the NBTC can help the NBTC to become more efficient and effective and achieve their mission of coping with the challenge of the convergence disruptive technology. Second, reducing the failure of the organisational change implementation can help improve the capability of the NBTC in delivering, as well as improving the confidence of the broadcasting operators, telecommunication operators and the consumers in respect of the capability and reputation of the NBTC. Third, reducing the failure of the organisational change implementation of the NBTC can help promote the broadcasting and telecommunication industries to develop and grow sustainably.

This chapter consists of five parts. 1: the conclusions provide the overall summary of the thesis to give answers for the research objectives according to

the result findings of the study. 2: the reflections provide the reflections of the research findings 3: the Implications provide the implications of the research findings, 4: the recommendations for future research study, and 5: summary.

## 6.1 Conclusions

A mixed method research is used to conduct this action research. The qualitative method is conducted through the in-depth and semi-structured interview of the nine participants. These are senior executives, and senior directors of the office of the National Broadcasting and Telecommunications Commission (NBTC), senior executives of broadcasting operators, senior executives of telecommunications operators, and a senior academic researcher. This is proceeded in two phases: (1) development of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the newly combined broadcasting and telecommunications licensing bureau of the NBTC, and (2) development of the new redesign business processes of the Business Process Management (BPM) and development of the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM). The new combined broadcasting and telecommunications licensing bureau of the NBTC is the focussed area of this study. The quantitative and qualitative approach are also applied through the Analytic Hierarchy Process (AHP) to rank pairwise the priorities of both Critical Success Factors (CSFs) and Key Performance Indicators (KPIs) in order to develop the final Taxonomies.

**In phase 1**, the initial data of the Critical Success Factors (CSFs) of the Organisational Change Management is collected from the intensive literature review as well as the initial interview of the nine participants, totalling 84 Critical Success Factors (CSFs). The initial data and then is refined into 36 Critical Success Factors (CSFs), which could be classified into four categories (1) Organisational Critical Success Factors (CSFs), (2) Human Capital Critical Success Factors (CSFs), (3) Operations Critical Success Factors (CSFs), and (3) Technology Critical Success Factors (CSFs).

The Analytic Hierarchy Process (AHP) is used to pairwise rank the Critical Success Factors (CSFs) through the interview of the nine participants and classified into three classes (1) class A (most important), (2) class B (second most important), and (3) class C (third most important). The result of the Organisational Critical Success Factors (CSFs) shows that Class A:CSFs (most important) consist of CSF1 (Change Vision and Mission), CSF7 (Organisational Culture), and CSF3 (Organisational Change Strategy). The Class B:CSFs consist of CSF4 (Organisational Infrastructure), CSF2 (Change Goals and Objectives), and CSF3 (Organisational Change Strategy). In addition, Class C:CSFs is the third most important Organisational CSFs, and consist of CSF9 (Interorganisational Integration), CSF5 (Performance and Reward System), and CSF6 (Organisational Structure).

The Human Capital Critical Success Factors (CSFs) consist of Class A:CSFs (most important) with CSF10 (Leadership Commitment and Support), CSF18 (Sense of Organisational Change Urgency), and CSF13 (Employee Engagement). These Human Capital Critical Success Factors (CSFs) are classified to be the most important (>16%), for which continuous monitoring and corrective actions must take place in order to achieve the goals and objectives. The Class B:CSFs (second most important) had a score between 6% - 11% and consists of CSF11 (Human Resource Competency), CSF16 (Quick Win Management), and CSF17 (Organisational Change Champion), for which the organisation must keep monitoring regularly to integrate with Class A:CSFs and Class C:CSFs. In addition, Class C:CSFs is the third most important Organisational CSFs, which consist of CSF15 (Knowledge Management (KM) Team), CSF14 (Effective Self-Managing Team), and CSF12 (Human Capital Management), which are considered as the supportive CSFs of Class A and Class B Organisational Critical Success Factors (CSFs) and for which the organisation should monitor as supportive or long term tracking.

The Operations Critical Success Factors (CSFs) consist of Class A:CSFs (most important) with CSF19 (Operational Change Strategy), CSF21 (Business Process Management: BPM), and CSF23 (Operational Strategic Alignment). The Class B:CSFs (second most important) consist of CSF24 (Licensing Approval and Renewal Process), CSF26 (Project Management),

and CSF22 (Customer Relationship Management: CRM). In addition, Class C:CSFs is the third most important Operations CSFs, which consist of CSF20 (Organisational Change Process), CSF25 (Hot Line System), and CSF27 (Continuous Improvement and Optimization).

The Technology Critical Success Factors (CSFs) consist of Class A:CSFs (most important) and consist of CSF28 (Big Data Technology), CSF29 (Business Intelligence: BI Technology), and CSF30 (Digital Government Technology). The Class B:CSFs (second most important) consist of CSF36 (Customer Engagement Technology), CSF33 (Technology Evaluation and Control System), and CSF34 (Intergovernmental Integration Technology), In Class C:CSFs is the third most important Technology Critical Success Factors (CSFs), which consist of CSF35 (Customer Engagement Technology), CSF31 (Customer Support and Service: CSS), and CSF32 (Artificial Intelligence: AI Technology).

Moreover, the Critical Success Factors (CSFs) of the Organisational Change Management that are classified to be class A (the most important), the organisational must monitor continuously, and corrective action must take place in order to achieve the goals and objectives. In class B (second most important), the organisation must keep monitoring regularly to integrate with Class A:CSFs and Class C:CSFs. Finally, class C (third most important) are considered as the supportive CSFs of Class A and Class B and the organisation should monitor as supportive or long-term tracking. The final Critical Success Factors (CSFs) of the Organisational Change Management is shown in table 6.1.

**Table 6.1** The Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the Office of The National Broadcasting and Telecommunications Commission (NBTC)

Group of Success Factors (CSFs)	CSFs Categories	Critical Success Factors (CSFs)
1. Organisational Factors	<b>Class A Organisational CSFs</b>	CSF 1 Change Vision and Mission CSF 7 Organisational Culture CSF 3 Organisational Change Strategy
	<b>Class B Organisational CSFs</b>	CSF 4 Organisational Infrastructure CSF 2 Change Goals and Objectives CSF 9 Interorganisational Integration
	<b>Class C Organisational CSFs</b>	CSF 8 Resource Allocation CSF 5 Performance and Reward System CSF 6 Organisational Structure
2. Human Capital Factors	<b>Class A Human Capital CSFs</b>	CSF 10 Leadership Commitment and Support CSF 18 Sense of Organisational Change Urgency CSF 13 Employee Engagement
	<b>Class B Human Capital CSFs</b>	CSF 11 Human Resource Competency CSF 16 Quick Win Management CSF 17 Organisational Change Champion
	<b>Class C Human Capital CSFs</b>	CSF 15 Knowledge Management (KM) Team CSF 14 Effective Self-Managing Teamwork CSF 12 Human Capital Development

**Table 6.1** The Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the Office of The National Broadcasting and Telecommunications Commission (cont.)

Group of Success Factors (CSFs)	CSFs Categories	Critical Success Factors (CSFs)
<b>3. Operations Factors</b>	<b>Class A Operations CSFs</b>	CSF 19 Operational Change Strategy
		CSF 21 Business Process Management (BPM)
		CSF 23 Organisational Strategic Alignment
	<b>Class B Operations CSFs</b>	CSF 24 Licensing Approval and Renewal Process
		CSF 26 Project Management
		CSF 22 Customer Relationship Management (CRM)
	<b>Class C Operations CSFs</b>	CSF 20 Organisational Change Process
		CSF 25 Hot Line System
		CSF 27 Continuous Improvement and Optimization
<b>4. Technology Factors</b>	<b>Class A Human Capital CSFs</b>	CSF 28 Big Data Technology
		CSF 29 Business Intelligence (BI) Technology
		CSF 30 Digital Government Technology
	<b>Class B Human Capital CSFs</b>	CSF 36 Communication Technology
		CSF 33 Technology Evaluation and Control System
		CSF 34 Intergovernmental Integration Technology
	<b>Class C Human Capital CSFs</b>	CSF 35 Customer Engagement Technology
		CSF 31 Customer Support and Service (CSS)
		CSF 32 Artificial Intelligence (AI) Technology

The outcome is aligned to Fritzenscaft (2011) argues that the Critical Success Factors (CSFs) of the Organisational Change Management are very useful for the organisations to use to develop the most suitable framework to transform to lead the organisational change more effectively. I believe that I can extend this knowledge to organisational change management across the NBTC successful.

**In phase 2**, aims to develop the new redesign of the business processes and the Key Performance Indicators of Business Process Management (BPM), which can be described as follows:

**(1) The new redesign of the business processes of the Business Process Management (BPM)**

The action cycle 1 of phase 2 is to develop the new redesign of the businesses of the Business Process Management (BPM) of the newly combined broadcasting and telecommunications licensing bureau of the NBTC. This action cycle consists of 4 action steps, which can be summarized as follows:

The action step 1 is to review the existing business processes of the newly combined broadcasting and telecommunications licensing bureau of the NBTC in order to understand the existing business processes, which is used for the action step 2. The discovery of the existing business processes finds that the current frequency spectrum licensing business consists of nine steps: 1) filling in all application forms, 2) preparing all required documents, 3) checking and correcting all application documents, 4) resubmitting all corrected documents, 5) approving business licenses, 6) paying license fees, 7) issuing all relevant licenses, 8) the operator receiving all approved licenses, and 9) operating the broadcasting/telecommunication businesses.

The action step 2 aims to conduct the in-depth interview of nine participants to seek for their inputs about the problems and issues of the existing business processes. The action step 3 is to refine problems, and issues of the existing business processes and their suggestions for the new redesign of the business processes.

The inputs of nine participants identify the process problems that consist of too many types of licenses, lack of manpower, lack of digital government skills, many supporting document to be verified, and inconvenient license fee payment methods. In addition, the operators must fill in application forms every time for both new frequency spectrum licenses or the renewal of frequency spectrum licenses manually by themselves, this is considered as an intensive

repetitive work effort, the approval and corrective licensing applications took a very long time for both internal NBTC processes and coordinating with other relevant government agencies, the license fees' payment must pay for many different frequency spectrum licenses, this caused inconvenience for the operators as well as consumed a lot of time and operating expenses, the issuance of the frequency spectrum licenses must apply to and receive approval from many different government agencies, the frequency spectrum license renewal process must start from the beginning every time, this led to a repetitive renewal process that was considered as a waste of time and resources.

The action step 4 is to newly redesign of the business processes and to develop the frequency spectrum licensing application via electronic license (License One Platform Conceptual Design), linking a common data base with other relevant government agencies sharing the common online data bases for the supporting documents required for the frequency spectrum licensing approval of both new license applications and renewal applications, development of the electronic or digital system for license on application submission process, development of the alert and monitoring systems for the progress and results of the license one application, development of the license fee payment through the electronic payment system (e-payment) and development of the standard evaluation system of the electronic license one system.

Furthermore, the implementation of the new Business Process Management (BPM) must review and revise the rules, regulations, and procedures to conform with the new redesign frequency spectrum licensing business process of License One System, creating a large new data center for the relevant government agencies to collaborate to develop and share the essential common data-bases, governing the License One System to be transparent, flexible, ethical and accountable, to gain confidence, trust, and respect among different relevant government agencies and operators, development of the digital government service competence and knowledge for the government officers to be capable to adapt to the change of the new redesign frequency spectrum licensing business process of License One

System, and embed a service-minded corporate culture for government staff and officers to be energetic and proactive to serve the operators under the convergence disruptive technology of the broadcasting and telecommunication industries. Moreover, the process monitoring, evaluating and corrective actions is critical to ensure that the redesign frequency spectrum licensing business process of License One System must closely monitor the business process performance through the Key Performance Indicators (KPIs), and this will be further developed in action cycle 2 to action cycle 4 of phase 2 to develop the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM).

### **(1) The new redesign of the business processes of the Business Process Management (BPM)**

The final part of this action research is to develop the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM), and it was found that that the Class A:CSFs (the most important) Key Performance Indicators (KPIs) consist of KPI5 (Productivity Improvement), KPI3 (Customer Satisfaction Index), and KPI4 (License Renewal Time). These Key Performance Indicators (KPIs) are classified to be the most important (>16%), for which continuous monitoring and corrective action must take place in order to achieve the goals and objectives. The Class B:KPIs (second most important) had a score between 6% - 12%. These consist of KPI1 (Net License Revenue per Employee), KPI6 (Ontime License Service Process), and KPI2 (Operating Expense per Total License Fees), which the organisation must monitor regularly to integrate with Class A:CSFs and Class C:CSFs. In addition, Class C:CSFs are the third most important Key Performance Indicators (KPIs), which consist of KPI8 (Employee Satisfaction Index), KPI7 (Investment in Process Innovation per License Revenue), and KPI9 (Suggested Improvement per Employee), these are considered as the supportive KPIs of Class A and Class B Key Performance Indicators (KPIs) and the organisation should monitor as supportive or long term tracking. Table 6.2 shows the final Key Performance Indicators (KPIs) of the Business Process Management (BPM).

**Table 6.2** The final Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) of the Office of The National Broadcasting and Telecommunications Commission (NBTC)

Performance Focused Area	KPIs Categories	Key Performance Indicators (KPIs)
Business Process Management (BPM)	Class A KPIs	KPI 5 Productivity Improvement KPI 3 Customer Satisfaction Index KPI 4 License Renewal Time
	Class B KPIs	KPI 1 Net License Revenue per Employee KPI 6 Ontime License Service Process KPI 2 Operating Expense per Total License Fees
	Class C KPIs	KPI 8 Employee Satisfaction Index KPI 7 Investment in Process Innovation per License Revenue CSF 6 Organisational Structure

The outcome of phase 2 is aligned to the research study of Binci (2020) argues that the Key Performance Indicators (KPIs) of the Business Process Management (BPM) is considered as highly effective management tool to measure the business process performance according to the organisational change vision and objectives, it is critical for the organisation change team to keep monitoring, evaluating, and taking corrective actions of the real performance if it deviates from the expected KPIs targets. I believe that can apply this knowledge to handle the Business Process Management (BPM) at the NBTC more effectively and successfully.

## 6.2 Reflections

The initial results of the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management are perceived to be acceptable and

useful by the group of nine participants. The nine participants accept the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management with an overall average mean score of 4.69, on a scale of 1 to 5, the overall average standard deviation is 0.53, and this is considered as of a high consistency. The study results are similar to Rockart (1979) who argues that the existence of Critical Success Factors (CSFs) for implementing the organisational change, and the identification of these factors would be very useful for managers in influencing the outcome the effort of organisational change implementation. In addition, Buh, et al. (2015) argue that the Critical Success Factors (CSFs) of Business Process Management (BPM) adoption is very important and should be clearly identified, as the BPM adoption can be initiated for various goals and objectives. The success factors are the key areas where “things must go right” in order to adopt the BPM completely, efficiently, and successfully.

The validation of the acceptability and the usefulness of the Key Performance Indicators (KPIs) Taxonomy of Business Process Management (BPM) results showed that an overall average mean score is 4.44 on a scale of 1 to 5, and the overall average standard deviation is 0.53, which is considered as of high consistency. Therefore, the Key Performance Indicators (KPIs) Taxonomy of Business Process Management (BPM) are highly relevant to the Business Process Management (BPM). The study results are relevant to Ljungholm (2015), who argues that Key Performance Indicators (KPIs) are very important for government organisational performance measurement and management systems. The performance is very useful for government organisations to monitor the public services and to ensure that the public service goals and services are accomplished within the schedule, as well as the fact that high quality public services must be delivered at the same time to maximize social satisfaction. The Key Performance Indicators (KPIs) Taxonomy provides a guidance for the working procedure consideration to deliver a desirable outcome for public organisations.

The reflection of this action research study helps me be better understanding the importance and the usefulness of both taxonomies. I strongly believe that I can use them as my management tools or guidelines to think more

strategically to develop the organisational strategies for both short term and long term to cope with the disruptive technology convergence of broadcasting and telecommunications. I also think that the successful organisational Change Management also requires the successful Business Process Management (BPM); therefore, these two managerial areas must apply the essential management tools, which both taxonomies are very effective as the management tools.

### **6.3 Implications**

The Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and the Key Performance Indicators (KPIs) Taxonomy provide great benefits and contributions to both theoretical and practical implications.

#### **6.3.1 Theoretical implication**

The action research study of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management does not create a new academic theory. However, it does provide a complement to the relevant organisational change management concept in terms of the relationship of the Critical Success Factors (CSFs) and the Organisational Change Management theory. The organisational change management can use the CSFs Taxonomy as the major focused areas that the organisation must allocate time and critical resources enough for these areas to ensure the successful organisational change implementation. The validation of contributions of the proposed two taxonomies of Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and Key Performance Indicators (KPIs) to the Organisational Change Management results show that the proposed taxonomies provided benefits to Organisational Change Management with an overall average mean score of 4.56, and the overall average standard deviation is 0.61, which is considered as of a high consistency. According to Rockart (1979) argues that Critical Success Factors (CSFs) are used to determine the critical information for top management to make high quality

decisions to manage the business effectively and successfully. Thus, if the CSFs exist for implementing an organisational change, the identification of these factors would be very useful for managers in influencing the outcome of the organisational change implementation efforts. I think that the organisation has limited resources to use to manage its business, which it is important to allocate the resources effectively to ensure the accomplishment of its goals and objectives. Therefore, it is very useful to identify the CSFs and allocate the organisational resources as well as pay most attention to these CSFs. In addition, Fritzenschaft (2011) argues that a successful management who is leading change cannot formulate a single standardized process. The change tactics should engage the employees as early as possible, and the best change tactics should be based on planning and a methodological transformation that are best responded by the employees, as well as the key stakeholders. Leaders who lead and manage successful organisational change accept that there are different CSFs and use them to develop the most suitable framework to transform organisational change.

The Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) is complementary to the performance management system and the Business Process Management (BPM) theory. An organisation can use these study results as learning tools to learn new knowledge of the importance and the relationship, and this can enhance the organisational capability to cope with the disruptive technology convergence of broadcasting and telecommunications. According to Buh, et al. (2015) argue that the Business Process Management (BPM) involves many management areas, and includes project management, and performance measurement through Key Performance Indicators (KPIs), for which the knowledge of the relevant management theories and concepts is very important in implementing the Business Process Management (BPM) effectively and successfully.

Furthermore, the organisations can capture and transfer both explicit and tacit knowledge and experience of the success of the Organisational Change Management and Business Process Management (BPM) related to the Critical Success Factors (CSFs) and Key Performance Indicators (KPIs) respectively to other business units or to a new generation of employees within

their organisation to build up the competence and capability of the Organisational Change Management and Business Process Management (BPM) as a Knowledge Management (KM) system. The validation of the contributions of the proposed Taxonomies to the Knowledge Management (KM) concept, in which the results shows that an overall average mean score is 4.47, and the overall average standard deviation is 0.66, and this is considered as of a high consistency. Therefore, the proposed two Taxonomies provided benefits for the Knowledge Management (KM) concepts. Fritzenschaft (2011) argues that the Critical Success Factors (CSFs) can be used as a learning framework for organisational leaders and other stakeholders to learn and transfer knowledge and develop the most suitable framework to successfully transform organisational change.

### **6.3.2 Action learning implication**

This research study provide insight to the insider researcher who has the dual role as deputy secretary-general of the Office of The National Broadcasting and Telecommunications Commission (NBTC) to how Critical Success Factors (CSFs) are very important and very useful in successful implementation of organisational change management. Therefore, the insider researcher as organisational leader can adopt the study results and create critical organisational change goals and objectives on which they must focus to make decisions to allocate time and resources more efficiently and more effectively, in order to successfully manage organisational change. In addition, I believe that I can apply knowledge from this action research study to develop and enhance the required individual and organisational knowledge and competence in order to ensure that they have sufficient capability to successfully handle organisational change under the disruptive technological convergence environment. In this action research study, I can apply the action learning to identify and develop the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management, which I focus on the new combined licensing bureau of the NBTC, I find that the developed CSFs taxonomy is very useful for me identify the most important areas to allocate time and limited resources to these critical factors in order to lead the organisational change management successful, which is aligned to Rockart (1979) states that the

Critical Success Factors (CSFs) is very essential for the organisational leaders to use it to make high quality decisions to manage the organisational change successfully through more effective implementing organisational change management. I am confident that I can apply the knowledge of the Critical Success Factors (CSFs) of the Organisational Change Management as the management tool to other bureaus of the NBTC as well as to integrate the overall Critical Success Factors (CSFs) of the Organisational Management for the whole bureaus of the NBTC, which I can lead the organisational change management of the NBTC more effective and successfully. In addition, I think that I can extend the lessoned learn of the business process redesign action plans of the Business Process Management (BPM) of the new combined licensing bureau of the NBTC to other most important (class A) Critical Success Factors (CSFs) to develop the action plans to enhance the operating performance through the Key Performance Indicators (KPIs).

Moreover, I also believe that can adopt knowledge of this action research study of both taxonomies to develop central knowledge for the entire organisation's future organisational change towards knowledge capability. In addition, I think that I can also apply the knowledge of the taxonomies to analyze the impact of change and to further develop the organisational change strategy more effectively through prediction and preparation for future change more precisely. According to Arnaboldi, et al. (2015) it is argued that performance measurement and management in the public sector are very challenging and very important for government organisation to implement in order to ensure the quality of their public services. Therefore, performance measurement enables the government organisations to rationalize their public service operations to enhance their productivity using the Business Process Management (BPM), and this can utilize the government budget more efficiently.

## **6.4 Limitation and recommendations for future research study**

In this action research study mainly focuses on the newly combined broadcasting and telecommunications licensing bureau of the NBTC. However, this is considered as the limitation of this study because there are totally thirty eight bureaus at the NBTC. Therefore, both CSFs Taxonomy of the Organisational Change Management and KPIs Taxonomy of the Business Process Management (BPM) might not represent other bureaus or across the NBTC. In addition, the disruptive technology convergence of broadcasting and telecommunications is not static, but it is dynamic changing; therefore, these impacts might cause to change the CSFs Taxonomy or KPIs Taxonomy.

According to the limitation of this action research study, I would like to recommend for future research study as follows.

(1) The future research study should extend to other bureaus of the NBTC in order to cover all bureaus that might have different CSFs Taxonomy of the Organisational Change Management because of the different functions or scope of works.

(2) The future research study should also cover across the NBTC in order to integrate the CSFs Taxonomy of the Organisational Change Management in order to manage the organisational change of the whole organisation.

(3) The future research study should study the business processes of other bureau as well as across the NBTC in order to redesign the new business processes that are more effective for the Business Process Management (BPM). The KPIs Taxonomy should also be developed for other bureaus that might have different business processes from the newly combined broadcasting and telecommunications licensing bureau.

(4) The future research study should further study the monitoring, evaluating, and corrective actions of both taxonomies that might have to be adjusted to match the dynamic changing disruptive technology convergence of broadcasting and telecommunications.

(5) The future research study can apply this research outcome and knowledge for the other organisations in both government and private sectors.

In summary, the future study should focus on the additional bureaus as well as across the NBTC in order to have action learning knowledge of both individual and whole organisation. I strongly believe that the future study can build up and enhance knowledge to implement Organisational Change Management and Business Process Management (BPM) successfully.

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## **APPENDIX A**

**THE INITIAL CRITICAL SUCCESS FACTORS (CSFs) TAXONOMY OF  
ORGANISATIONAL CHANGE MANAGEMENT AND DRAFT KEY  
PERFORMANCE INDICATORS (KPIs) TAXONOMY OF THE BUSINESS  
PROCESS MANAGEMENT (BPM)**

**Table A1:** The Initial Critical Success Factors (CSFs) Taxonomy of Organisational Change Management from the nine participants' interview

<b>Performance Focused Areas</b>	<b>Critical Success Factors (CSFs)</b>
<b>Organisational Change Management</b>	CSF 01. Change Vision and Mission
	CSF 02. Change Goals and Objectives
	CSF 03. Organisational Change Strategy
	CSF 04. Organisational Infrastructure
	CSF 05. Performance and Reward Systems
	CSF 06. Organisational Structure
	CSF 07. Organisational Culture
	CSF 08. Resource Allocation
	CSF 09. Interorganisational Integration
	CSF 13. Employee Engagement
	CSF 14. Effective Self-Managing Teamwork
	CSF 15. Knowledge Management (KM) Team
	CSF 16. Quick Win Management
	CSF 17. Organisational Change Champion
	CSF 18. Sense of Organisational Change Urgency
	CSF 19. Operational Change Strategy
	CSF 20. Organisational Change Process
	CSF 21. Business Process Management (BPM)
	CSF 22. Customer Relationship Management (CRM)
	CSF 23. Organisational Strategic Alignment
	CSF 24. Licensing Approval and Renewal Process
	CSF 25. Hot Line System
	CSF 26. Project Management
	CSF 27. Continuous Improvement and Optimization

**Table A1:** The Initial Critical Success Factors (CSFs) Taxonomy of Organisational Change Management from the nine participants' interview (cont.)

<b>Performance Focused Areas</b>	<b>Critical Success Factors (CSFs)</b>
<b>Organisational Change Management</b>	CSF 28. Big Data Technology CSF 29. Business Intelligence (BI) Technology CSF 30. Digital Government Technology CSF 31. Customer Support and Service (CSS) CSF 32. Artificial Intelligence (AI) Technology CSF 33. Technology Evaluation and Control System CSF 34. Intergovernmental Integration Technology CSF 35. Customer Engagement Technology CSF 36. Communication Technology

**Table A2:** Drafted Key Performance Indicators (KPIs) Taxonomy of Business Process Management (BPM) from the nine participants' interview

<b>Performance Focused Area</b>	<b>Key Performance Indicators (KPIs)</b>
<b>Business Process Management (BPM)</b>	KPI 01. Net License Revenue per Employee KPI 02. Operating Expense per Total License Fees KPI 03. Customer Satisfaction Index KPI 04. License Renewal Time KPI 05. Productivity Improvement KPI 06. Ontime License Service Process KPI 07. Investment in Process innovation per License Revenue KPI 08. Employee Satisfaction Index KPI 09. Suggested Improvement per Employee

## **APPENDIX B**

### **INTERVIEW QUESTIONS FOR PROPOSED TAXONOMIES DEVELOPMENT, VALIDATION AND RELIABILITY OF THE NINE RESEARCH PARTICIPANTS**

## The Interview of Nine Participants of Phase 1

### The Development of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management

#### Introduction

The major objective of Phase one of this research is to focus on the development of the Critical Success Factors (CSFs) of the Organisational Change Management of the new combined broadcasting and telecommunications licensing bureau of the Office of the National Broadcasting and Telecommunications Commission (NBTC).

The validation of this study aims to verify acceptability and usefulness of the CSFs Taxonomy to the Organisational Change Management. Furthermore, the validation of the contribution of the CSFs Taxonomy to Knowledge Management (KM) is also included. In addition, the reliability of the CSFs Taxonomy is verified using the Analytic Hierarchy Process (AHP) through a priority scale from 1 to 9 (see table B3, appendix B). The expertise of the nine participants is applied to the validation and reliability methodology.

**Action Cycle 1 of Phase 1:** The Development of the drafted CSFs Taxonomy of Organisational Change Management

**Action step 1: Intensive literature review of the CSFs:** The insider researcher conducts the intensive literature review of the CSFs of the Organisational Change Management and then develops initial potential list of the CSFs of the Organisational Change Management as shows in table B1.

**Action step 2 of Action Cycle 1 of Phase 1: In-depth interview of nine participants about initial potential CSFs of the Organisational Change Management:** The in-depth interview of nine participants consists of two sections. Section 1 consists of the demographic questions to ensure that nine participants are conformed with the sampling criteria. Section 2 consists of the questions to seek for the inputs of nine participants to refine list of the initial potential CSFs.

## Section 1: Demographic Questions

### 1. Organisational Type

- Broadcasting Operators                       Telecommunication Operators  
 Regulators    Academic Researcher                       Others.....

### 2. Number of Staffs

- <100     101 - 500     501-1,000     1,001-1,500     >1,500

### 3. Number of Business Years

- <50     50 -100     101-200     201-500     >500

### 4. Career Title

- President                       Vice President                       Director  
 General Manager                       Operations Manager                       Marketing Manager  
 Others.....

### 5. Gender

- Male                       Female

### 6. Age

- <30     31-40     41-50     51-60     >60

### 7. Working Experience (Years)

- <5     5-10     11-15     16-20     21-25  
 >25

### 8. Education Background

- Broadcasting     Telecommunications     Mass Communication     Laws  
 Others.....

**Section 2: The Refinement of the Initial Potential Critical Success Factors (CSFs) of the Organisational Change Management**

The section 2 of the action cycle 1 of phase 1 aims to refine the list of the initial potential CSFs of the Organisational Change Management from the literature review as well as the inputs from the in-depth interview of nine participants.

The initial list of the potential CSFs of the Organisational Change Management is developed from the intensive relevant literature review as shows in table B1. Please review table B1 and kindly the answer the following interview questions.

1. Do you think that the initial list of the potential CSFs of the Organisational Change Management that is developed from the intensive relevant literature review is acceptable and relevant to the CSFs of the Organisational Change Management of the NBTC?

**Your input:** .....

2. Please provide additional comments or suggestions about the initial list of the potential CSFs that you might have.

**Your input:** .....

3. Please provide the level of the importance of the initial CSFs in table B1 of the scale of low, medium, and high.

**Your input:** .....

**Table B1** The Initial List of the Critical Success Factors (CSFs) of the Organisational Change Management

Items	Initial Critical Success Factors (CSFs)	Ranking Scale
		(Low, Medium, and High)
1	Leadership Commitment and Support	
2	Business Intelligence (BI) Technology	
3	Skillful and Trained Staff	
4	Organisational Culture	
5	Customer Information Management	
6	Customer Support and Service (CSS)	
7	Employee Engagement	
8	Monitoring, Controlling, and Correction	
9	Knowledge Management (KM) Team	
10	Change Vision and Mission	
11	Organisational Infrastructure	
12	CRM Software Selection	
13	Interorganisational Integration	
14	Customer Contact Management	
15	Services Automation	
16	Sales Automation	
17	Customers/Consultant Involvement	
18	Process Change	
19	Customer Satisfaction	
20	Marketing Automation	
21	Time and Budget Management	
22	Software Customization	
23	Organisational Change Champion	
24	CRM Champion	

**Table B1** The Initial List of the Critical Success Factors (CSFs) of the Organisational Change Management, (cont.)

Items	Initial Critical Success Factors (CSFs)	Ranking Scale (Low, Medium, and High)
25	Shared Data Willingness	
26	Customer Segmentation	
27	Size of Organisation	
28	Organisational Change Process	
29	Procedures and Policy	
30	Creation of Multidisciplinary Team	
31	Understanding the Environment	
32	Competences and Commitment	
33	Human Resource Competency	
34	Establishment of Confidence	
35	Creation of a Shared Problem Awareness	
36	Communication Technology	
37	Change of Goals and Objectives	
38	Resource Allocation (time, money, people)	
39	Systematic Thinking Process	
40	Sense of Organisational Change Urgency	
41	Organisational Change Strategy	
42	Quick Win Management	
43	Monitoring and Making Adjustments	
44	Setting up Objectives and Milestones of Activities	
45	Setting up the Communication Message	
46	Customer Relationship Management (CRM)	
47	Provision of Training and Workshops	
48	Consult Employee Representatives	
49	Innovative Reward system	
50	Continuous Improvement and Optimization	
51	Shared Problem Awareness	
52	Comprehensive Diagnosis	

**Table B1** The Initial List of the Critical Success Factors (CSFs) of the Organisational Change Management, (cont.)

Items	Initial Critical Success Factors (CSFs)	Ranking Scale (Low, Medium, and High)
53	Management Coalition	
54	Definition of Working Procedures	
57	Licensing Approval and Renewal Process	
58	Big Data Technology	
59	Technology Evaluation and Control System	
60	Digital Government Technology	
61	Intergovernmental Integration Technology	
62	Organisational Strategic Alignment	
63	Cooperative Organisational Culture	
64	Organisational Acceptance of New Technology	
65	Hot Line System	
66	Supporting Agile Working Environment	
67	Business Process Management (BPM)	
68	Human Capital Development	
69	Artificial Intelligence (AI) Technology	
70	Knowledgeable Management Team	
71	Effective Management Style	
72	Effective Self-Managing Teamwork	
73	Performance and Reward Systems	
74	Operational Change Strategy	
75	Compliance with the Project Management Process	
76	Compliance with the Configuration Management Process	
77	Strong Communication of the Process Progress	
78	Strong Customer Commitment	
79	Well-Designed Simple Technical Standards	
80	Following the Technical Design Standard	
81	Right Amount of Documentation	
82	Technical Training for Team Members	

**Table B1** The Initial List of the Critical Success Factors (CSFs) of the Organisational Change Management, (cont.)

Items	Initial Critical Success Factors (CSFs)	Ranking Scale (Low, Medium, and High)
83	Organisational Structure	
84	Project Management	

**Action step 3: Develop the first drafted CSFs Taxonomy of the Organisational Change Management:** This step is to adjust the proposed initial potential CSFs from the intensive literature review with the inputs from the interview of nine participants. The drafted CSFs Taxonomy of the Organisational Change Management is further developed at this action step as shows in table B2.

**Table B2** First Drafted Critical Success Factors (CSFs) Taxonomy of Organisational Change Management

<b>Performance Focused Areas</b>	<b>Critical Success Factors (CSFs)</b>
<b>Organisational Change Management</b>	CSF 01. Change Vision and Mission CSF 02. Change Goals and Objectives CSF 03. Organisational Change Strategy CSF 04. Organisational Infrastructure CSF 05. Performance and Reward Systems CSF 06. Organisational Structure CSF 07. Organisational Culture CSF 08. Resource Allocation CSF 09. Interorganisational Integration CSF 13. Employee Engagement CSF 14. Effective Self-Managing Teamwork CSF 15. Knowledge Management (KM) Team CSF 16. Quick Win Management CSF 17. Organisational Change Champion CSF 18. Sense of Organisational Change Urgency CSF 19. Operational Change Strategy CSF 20. Organisational Change Process CSF 21. Business Process Management (BPM) CSF 22. Customer Relationship Management (CRM) CSF 23. Organisational Strategic Alignment CSF 24. Licensing Approval and Renewal Process CSF 25. Hot Line System CSF 26. Project Management CSF 27. Continuous Improvement and Optimization

**Table B2** First Drafted Critical Success Factors (CSFs) Taxonomy of Organisational Change Management (cont.)

<b>Performance Focused Areas</b>	<b>Critical Success Factors (CSFs)</b>
<b>Organisational Change Management</b>	CSF 28. Big Data Technology CSF 29. Business Intelligence (BI) Technology CSF 30. Digital Government Technology CSF 31. Customer Support and Service (CSS) CSF 32. Artificial Intelligence (AI) Technology CSF 33. Technology Evaluation and Control System CSF 34. Intergovernmental Integration Technology CSF 35. Customer Engagement Technology CSF 36. Communication Technology

## **Action Cycle 2 of Phase 1 and Interview Questions**

The Development of the Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management

### **Action cycle 2 of phase 1**

The action cycle 2 of phase 1 focusses on developing the final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the new combined broadcasting and communications licensing bureau of the NBTC. This action cycle consists of 4 action steps, but the in-depth interview of nine participants is conducted at the action step 2 of action cycle 2 of phase 1 as follows.

**Action step 2: Rank the list of the second drafted CSFs Taxonomy using AHP:** This step consists 1 question to in-depth interview with nine participants to rank the final list of the second drafted CSFs Taxonomy using the statistical tool of the Analytic Hierarchy Process (AHP) through a priority scale from 1 to 9 (see table B4, appendix B) to pairwise to rank the Critical Success Factors (CSFs) through the interview of the nine participants to be classified into three classes (1) class A (most important CSFs), (2) Class B (second most important CSFs), and (3) class C (third most important CSFs).

### **Instruction**

The purpose of the interview of action cycle 2 of phase 1 is to further develop the second drafted Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management from action cycle 1 (table B3) through the priority ranking of the categorized factors of the Critical Success Factors (CSFs) of the Organisational Change Management.

1. Please rank the priority of each categorized factor of the CSFs Taxonomy the Organisational Change Management from table B3 using pairwise comparison scale for Analytic Hierarchy Process (AHP) from table B4.

**Your inputs:** .....

**Table B3** Second Draft Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management

<b>Categorized Factors</b>	<b>Critical Success Factors (CSFs)</b>
<b>1. Organisational Factors</b>	CSF 01. Change Vision and Mission CSF 02. Change Goals and Objectives CSF 03. Organisational Change Strategy CSF 04. Organisational Infrastructure CSF 05. Performance and Reward Systems CSF 06. Organisational Structure CSF 07. Organisational Culture CSF 08. Resource Allocation CSF 09. Interorganisational Integration
<b>2. Human Capital Factors</b>	CSF 10. Leadership Commitment and Support CSF 11. Human Resource Competency CSF 12. Human Capital Development CSF 13. Employee Engagement CSF 14. Effective Self-Managing Teamwork CSF 15. Knowledge Management (KM) Team CSF 16. Quick Win Management CSF 17. Organisational Change Champion CSF 18. Sense of Organisational Change Urgency
<b>3. Operational Factors</b>	CSF 19. Operational Change Strategy CSF 20. Organisational Change Process CSF 21. Business Process Management (BPM) CSF 22. Customer Relationship Management (CRM) CSF 23. Organisational Strategic Alignment CSF 24. Licensing Approval and Renewal Process CSF 25. Hot Line System CSF 26. Project Management CSF 27. Continuous Improvement and Optimization

**Table B3** Second Draft Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management (cont.)

Group Factors	Critical Success Factors (CSFs)
<b>4. Technological Factors</b>	CSF 28. Big Data Technology CSF 29. Business Intelligence (BI) Technology CSF 30. Digital Government Technology CSF 31. Customer Support and Service (CSS) CSF 32. Artificial Intelligence (AI) Technology CSF 33. Technology Evaluation and Control System CSF 34. Intergovernmental Integration Technology CSF 35. Customer Engagement Technology CSF 36. Communication Technology

Table B4 shows the fundamental scale for pairwise comparison, which Saaty (2001) recommends - based on his personal experience.

**Table B4** Pairwise comparison scale for Analytic Hierarchy Process (AHP)

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Moderate importance	Experience and judgment slightly favor one activity over another
5	Strong importance	Experience and judgment strongly favor one activity over another
7	Very strong or demonstrated importance	An activity is favored very strongly over another; its dominance demonstrated in practice
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order of affirmation
2,4,6,8	For compromise between the above values	Sometimes one needs to interpolate a compromise judgment numerically because there is no proper word to describe it

Source: Saaty, T.L., 2001, Decision Making for Leaders, RWS Publication, Pittsburgh

**Table B5** Organisational Critical Factors (CSFs) of the Organisational Change Management

Critical Success Factors (CSFs): Organisational Factors	Ranking Priority																Critical Success Factors (CSFs): Organisational Factors	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
CSF 01. Organisational Change Vision and Mission																		CSF 02. Organisational Goals and Objectives
CSF 01. Organisational Change Vision and Mission																		CSF 03. Organisational Change Strategy
CSF 01. Organisational Change Vision and Mission																		CSF 04. Organisational Infrastructure
CSF 01. Organisational Change Vision and Mission																		CSF 05. Performance and Reward Systems
CSF 01. Organisational Change Vision and Mission																		CSF 06. Organisational Structure
CSF 01. Organisational Change Vision and Mission																		CSF 07. Organisational Culture
CSF 01. Organisational Change Vision and Mission																		CSF 08. Resource Allocation
CSF 01. Organisational Change Vision and Mission																		CSF 09. Interorganisational Integration
CSF 02. Organisational Goals and Objectives																		CSF 03. Organisational Change Strategy

**Table B5** Organisational Critical Factors (CSFs) of the Organisational Change Management (Cont.)

Critical Success Factors (CSFs):  Organisational Factors	Ranking Priority																Critical Success Factors (CSFs):  Organisational Factors	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
CSF 02. Organisational Goals and Objectives																		CSF 04. Organisational Infrastructure
CSF 02. Organisational Goals and Objectives																		CSF 05. Performance and Reward Systems
CSF 02. Organisational Goals and Objectives																		CSF 06. Organisational Structure
CSF 02. Organisational Goals and Objectives																		CSF 07. Organisational Culture
CSF 02. Organisational Goals and Objectives																		CSF 08. Resource Allocation
CSF 02. Organisational Goals and Objectives																		CSF 09. Interorganisational Integration
CSF 03. Organisational Change Strategy																		CSF 04. Organisational Infrastructure
CSF 03. Organisational Change Strategy																		CSF 05. Performance and Reward Systems
CSF 03. Organisational Change Strategy																		CSF 06. Organisational Structure

**Table B5** Organisational Critical Factors (CSFs) of the Organisational Change Management (Cont.)

Critical Success Factors (CSFs): Organisational Factors	Ranking Priority																Critical Success Factors (CSFs): Organisational Factors	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
CSF 03. Organisational Change Strategy																		CSF 07. Organisational Culture
CSF 03. Organisational Change Strategy																		CSF 08. Resource Allocation
CSF 03. Organisational Change Strategy																		CSF 09. Interorganisational Integration
CSF 04. Organisational Infrastructure																		CSF 05. Performance and Reward Systems
CSF 04. Organisational Infrastructure																		CSF 06. Organisational Structure
CSF 04. Organisational Infrastructure																		CSF 07. Organisational Culture
CSF 04. Organisational Infrastructure																		CSF 08. Resource Allocation
CSF 04. Organisational Infrastructure																		CSF 09. Interorganisational Integration
CSF 05. Performance and Reward Systems																		CSF 06. Organisational Structure

**Table B5** Organisational Critical Factors (CSFs) of the Organisational Change Management (Cont.)

Critical Success Factors (CSFs): Organisational Factors	Ranking Priority																Critical Success Factors (CSFs): Organisational Factors	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
CSF 05. Performance and Reward Systems																		CSF 07. Organisational Culture
CSF 05. Performance and Reward Systems																		CSF 08. Resource Allocation
CSF 05. Performance and Reward Systems																		CSF 09. Interorganisational Integration
CSF 06. Organisational Structure																		CSF 07. Organisational Culture
CSF 06. Organisational Structure																		CSF 08. Resource Allocation
CSF 06. Organisational Structure																		CSF 09. Interorganisational Integration
CSF 07. Organisational Culture																		CSF 08. Resource Allocation
CSF 07. Organisational Culture																		CSF 09. Interorganisational Integration
CSF 08. Resource Allocation																		CSF 09. Interorganisational Integration

**Table B6** Human Capital Critical Factors (CSFs) of Organisational Change Management

Critical Success Factors (CSFs):	Ranking Priority																	Critical Success Factors (CSFs):
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	
Human Capital Factors																		Human Capital Factors
CSF 10. Leadership Commitment and Support																		CSF 11. Human Resource Competency
CSF 10. Leadership Commitment and Support																		CSF 12. Human Capital Development
CSF 10. Leadership Commitment and Support																		CSF 13. Employee Engagement
CSF 10. Leadership Commitment and Support																		CSF 14. Effective Self-Managing Team
CSF 10. Leadership Commitment and Support																		CSF 15. Knowledge Management (KM) Team
CSF 10. Leadership Commitment and Support																		CSF 16. Quick Win Management
CSF 10. Leadership Commitment and Support																		CSF 17. Organisational Change Champion
CSF 10. Leadership Commitment and Support																		CSF 18. Sense of Organisational Change Urgency
CSF 11. Human Resource Competency																		CSF 12. Human Capital Development

**Table B6** Human Capital Critical Factors (CSFs) of Organisational Change Management (Cont.)

Critical Success Factors (CSFs):	Ranking Priority																	Critical Success Factors (CSFs):
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	
Human Capital Factors																		Human Capital Factors
CSF 11. Human Resource Competency																		CSF 13. Employee Engagement
CSF 11. Human Resource Competency																		CSF 14. Effective Self-Managing Team
CSF 11. Human Resource Competency																		CSF 15. Knowledge Management (KM) Team
CSF 11. Human Resource Competency																		CSF 16. Quick Win Management
CSF 11. Human Resource Competency																		CSF 17. Organisational Change Champion
CSF 11. Human Resource Competency																		CSF 18. Sense of Organisational Change Urgency
CSF 12. Human Capital Development																		CSF 13. Employee Engagement
CSF 12. Human Capital Development																		CSF 14. Effective Self-Managing Team
CSF 12. Human Capital Development																		CSF 15. Knowledge Management (KM) Team

**Table B6** Human Capital Critical Factors (CSFs) of Organisational Change Management (Cont.)

Critical Success Factors (CSFs):	Ranking Priority																Critical Success Factors (CSFs):
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	
Human Capital Factors																	Human Capital Factors
CSF 12. Human Capital Development																	CSF 16. Quick Win Management
CSF 12. Human Capital Development																	CSF 17. Organisational Change Champion
CSF 12. Human Capital Development																	CSF 18. Sense of Organisational Change Urgency
CSF 13. Employee Engagement																	CSF 14. Effective Self-Managing Team
CSF 13. Employee Engagement																	CSF 15. Knowledge Management (KM) Team
CSF 13. Employee Engagement																	CSF 16. Quick Win Management
CSF 13. Employee Engagement																	CSF 17. Organisational Change Champion
CSF 13. Employee Engagement																	CSF 18. Sense of Organisational Change Urgency
CSF 14. Effective Self-Management Team																	CSF 15. Knowledge Management (KM) Team

**Table B6** Human Capital Factor Category of the Critical Factors (CSFs) of Organisational Change Management (Cont.)

Critical Success Factors (CSFs):	Ranking Priority																	Critical Success Factors (CSFs):
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	
Human Capital Factors																		Human Capital Factors
CSF 14. Effective Self- Management Team																		CSF 16. Quick Win Management
CSF 14. Effective Self-Managing Team																		CSF 17. Organisational Change Champion
CSF 14. Effective Self- Management Team																		CSF 18. Sense of Organisational Change Urgency
CSF 15. Knowledge Management (KM) Team																		CSF 16. Quick Win Management
CSF 15. Knowledge Management (KM) Team																		CSF 17. Organisational Change Champion
CSF 15. Knowledge Management (KM) Team																		CSF 18. Sense of Organisational Change Urgency
CSF 16. Quick Win Management																		CSF 17. Organisational Change Champion
CSF 16. Quick Win Management																		CSF 18. Sense of Organisational Change Urgency
CSF 17. Organisational Change Champion																		CSF 18. Sense of Organisational Change Urgency

**Table B7** Operations Critical Factors (CSFs) of the Organisational Change Management

Critical Success Factors (CSFs): Operations Factors	Ranking Priority																		Critical Success Factors (CSFs): Operations Factors
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9		
CSF 19. Operational Change Strategy																		CSF 20. Organisational Change Process	
CSF 19. Operational Change Strategy																		CSF 21. Business Process Management (BPM)	
CSF 19. Operational Change Strategy																		CSF 22. Customer Relationship Management (CRM)	
CSF 19. Operational Change Strategy																		CSF 23. Organisational Strategic Alignment	
CSF 19. Operational Change Strategy																		CSF 24. Licensing Approval and Renewal Process	
CSF 19. Operational Change Strategy																		CSF 25. Hot Line System	
CSF 19. Operational Change Strategy																		CSF 26. Project Management	
CSF 19. Operational Change Strategy																		CSF 27. Continuous Improvement and Optimization	
CSF 20. Organisational Change Process																		CSF 21. Business Process Management (BPM)	

**Table B7** Operations Critical Factors (CSFs) of the Organisational Change Management (Cont.)

Critical Success Factors (CSFs):	Ranking Priority																	Critical Success Factors (CSFs):
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	
Operations Factors																		Operations Factors
CSF 20. Organisational Change Process																		CSF 22. Customer Relationship Management (CRM)
CSF 20. Organisational Change Process																		CSF 23. Organisational Strategic Alignment
CSF 20. Organisational Change Process																		CSF 24. Licensing Approval and Renewal Process
CSF 20. Organisational Change Process																		CSF 25. Hot Line System
CSF 20. Organisational Change Process																		CSF 26. Project Management
CSF 20. Organisational Change Process																		CSF 27. Continuous Improvement and Optimization
CSF 21. Business Process Management (BPM)																		CSF 22. Customer Relationship Management (CRM)
CSF 21. Business Process Management (BPM)																		CSF 23. Organisational Strategic Alignment
CSF 21. Business Process Management (BPM)																		CSF 24. Licensing Approval and Renewal Process

**Table B7** Operations Critical Factors (CSFs) of the Organisational Change Management (Cont.)

Critical Success Factors (CSFs):  Operations Factors	Ranking Priority																Critical Success Factors (CSFs):  Operations Factors	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
CSF 21. Business Process Management (BPM)																		CSF 25. Hot Line System
CSF 21. Business Process Management (BPM)																		CSF 26. Project Management
CSF 21. Business Process Management (BPM)																		CSF 27. Continuous Improvement and Optimization
CSF 22. Customer Relationship Management (CRM)																		CSF 23. Organisational Strategic Alignment
CSF 22. Customer Relationship Management (CRM)																		CSF 24. Licensing Approval and Renewal Process
CSF 22. Customer Relationship Management (CRM)																		CSF 25. Hot Line System
CSF 22. Customer Relationship Management (CRM)																		CSF 26. Project Management
CSF 22. Customer Relationship Management (CRM)																		CSF 27. Continuous Improvement and Optimization
CSF 23. Organisational Strategic Alignment																		CSF 24. Licensing Approval and Renewal Process

**Table B7** Operations Critical Factors (CSFs) of the Organisational Change Management (Cont.)

Critical Success Factors (CSFs): Operations Factors	Ranking Priority																	Critical Success Factors (CSFs): Operations Factors
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	
CSF 23. Organisational Strategic Alignment																		CSF 25. Hot Line System
CSF 23. Organisational Strategic Alignment																		CSF 26. Project Management
CSF 23. Organisational Strategic Alignment																		CSF 27. Continuous Improvement and Optimization
CSF 24. Licensing Approval and Renewal Process																		CSF 25. Hot Line System
CSF 24. Licensing Approval and Renewal Process																		CSF 26. Project Management
CSF 24. Licensing Approval and Renewal Process																		CSF 27. Continuous Improvement and Optimization
CSF 25. Hot Line System																		CSF 26. Project Management
CSF 25. Hot Line System																		CSF 27. Continuous Improvement and Optimization
CSF 26. Project Management																		CSF 27. Continuous Improvement and Optimization

**Table B8** Technology Critical Factors (CSFs) of Organisational Change Management

Critical Success Factors (CSFs): Technology Factors	Ranking Priority																Critical Success Factors (CSFs): Technology Factors	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
CSF 28. Big Data Technology																		CSF 29. Business Intelligence (BI) Technology
CSF 28. Big Data Technology																		CSF 30. Digital Government Technology
CSF 28. Big Data Technology																		CSF 31. Customer Support and Services (CSS)
CSF 28. Big Data Technology																		CSF 32. Artificial Intelligence (AI) Technology
CSF 28. Big Data Technology																		CSF 33. Technology Evaluation and Control System
CSF 28. Big Data Technology																		CSF 34. Intergovernmental Integration Technology
CSF 28. Big Data Technology																		CSF 35. Customer Engagement Technology
CSF 28. Big Data Technology																		CSF 36. Communication Technology
CSF 29. Business Intelligence (BI) Technology																		CSF 30. Digital Government Technology

**Table B8** Technology Critical Factors (CSFs) of Organisational Change Management (cont.)

Critical Success Factors (CSFs): Technology Factors	Ranking Priority																Critical Success Factors (CSFs): Technology Factors	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
CSF 29. Business Intelligence (BI) Technology																		CSF 31. Customer Support and Services (CSS)
CSF 29. Business Intelligence (BI) Technology																		CSF 32. Artificial Intelligence (AI) Technology
CSF 29. Business Intelligence (BI) Technology																		CSF 33. Technology Evaluation and Control System
CSF 29. Business Intelligence (BI) Technology																		CSF 34. Intergovernmental Integration Technology
CSF 29. Business Intelligence (BI) Technology																		CSF 35. Customer Engagement Technology
CSF 29. Business Intelligence (BI) Technology																		CSF 36. Communication Technology
CSF 30. Digital Government Technology																		CSF 31. Customer Support and Services (CSS)
CSF 30. Digital Government Technology																		CSF 32. Artificial Intelligence (AI) Technology
CSF 30. Digital Government Technology																		CSF 33. Technology Evaluation and Control System

**Table B8** Technology Critical Factors (CSFs) of Organisational Change Management (cont.)

Critical Success Factors (CSFs): Technology Factors	Ranking Priority																Critical Success Factors (CSFs): Technology Factors	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
CSF 30. Digital Government Technology																		CSF 34. Intergovernmental Integration Technology
CSF 30. Digital Government Technology																		CSF 35. Customer Engagement Technology
CSF 30. Digital Government Technology																		CSF 36. Communication Technology
CSF 31. Customer Support and Services (CSS)																		CSF 32. Artificial Intelligence (AI) Technology
CSF 31. Customer Support and Services (CSS)																		CSF 33. Technology Evaluation and Control System
CSF 31. Customer Support and Services (CSS)																		CSF 34. Intergovernmental Integration Technology
CSF 31. Customer Support and Services (CSS)																		CSF 35. Customer Engagement Technology
CSF 31. Customer Support and Services (CSS)																		CSF 36. Communication Technology
CSF 32. Artificial Intelligence (AI) Technology																		CSF 33. Technology Evaluation and Control System

**Table B8** Technology Critical Factors (CSFs) of Organisational Change Management (cont.)

Critical Success Factors (CSFs): Technology Factors	Ranking Priority																Critical Success Factors (CSFs): Technology Factors	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
CSF 32. Artificial Intelligence (AI) Technology																		CSF 34. Intergovernmental Integration Technology
CSF 32. Artificial Intelligence (AI) Technology																		CSF 35. Customer Engagement Technology
CSF 32. Artificial Intelligence (AI) Technology																		CSF 36. Communication Technology
CSF 33. Technology Evaluation and Control System																		CSF 34. Intergovernmental Integration Technology
CSF 33. Technology Evaluation and Control System																		CSF 35. Customer Engagement Technology
CSF 33. Technology Evaluation and Control System																		CSF 36. Communication Technology
CSF 34. Intergovernmental Integration Technology																		CSF 35. Customer Engagement Technology
CSF 34. Intergovernmental Integration Technology																		CSF 36. Communication Technology
CSF 35. Customer Engagement Technology																		CSF 36. Communication Technology

## **The Interview Questions for the Validity of the Acceptability and Usefulness of the Final CSFs Taxonomy to the Organisational Change Management**

### **Interview Questions of Action Step 1 of Action Cycle 3 of Phase 1**

The interview of the participants aims to receive opinions and feedback to develop and validate acceptability and usefulness of the final Critical Success Factors (CSFs) to the Organisational Change Management (Table B9). The interview will follow the five questions of part A below as well as be two open-end questions of part B for additional comments from the participants.

**Table B9** The Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the Office of The National Broadcasting and Telecommunications Commission (NBTC)

Group of Success Factors (CSFs)	CSFs Categories	Critical Success Factors (CSFs)
1. Organisational Factors	<b>Class A Organisational CSFs</b>	CSF 1 Change Vision and Mission CSF 7 Organisational Culture CSF 3 Organisational Change Strategy
	<b>Class B Organisational CSFs</b>	CSF 4 Organisational Infrastructure CSF 2 Change Goals and Objectives CSF 9 Interorganisational Integration
	<b>Class C Organisational CSFs</b>	CSF 8 Resource Allocation CSF 5 Performance and Reward System CSF 6 Organisational Structure
2. Human Capital Factors	<b>Class A Human Capital CSFs</b>	CSF 10 Leadership Commitment and Support CSF 18 Sense of Organisational Change Urgency CSF 13 Employee Engagement
	<b>Class B Human Capital CSFs</b>	CSF 11 Human Resource Competency CSF 16 Quick Win Management CSF 17 Organisational Change Champion
	<b>Class C Human Capital CSFs</b>	CSF 15 Knowledge Management (KM) Team CSF 14 Effective Self-Managing Teamwork CSF 12 Human Capital Development

**Table B9** The Final Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management of the Office of The National Broadcasting and Telecommunications Commission (cont.)

Group of Success Factors (CSFs)	CSFs Categories	Critical Success Factors (CSFs)
3. Operations Factors	<b>Class A Operations CSFs</b>	CSF 19 Operational Change Strategy CSF 21 Business Process Management (BPM) CSF 23 Organisational Strategic Alignment
	<b>Class B Operations CSFs</b>	CSF 24 Licensing Approval and Renewal Process CSF 26 Project Management CSF 22 Customer Relationship Management (CRM)
	<b>Class C Operations CSFs</b>	CSF 20 Organisational Change Process CSF 25 Hot Line System CSF 27 Continuous Improvement and Optimization
4. Technology Factors	<b>Class A Human Capital CSFs</b>	CSF 28 Big Data Technology CSF 29 Business Intelligence (BI) Technology CSF 30 Digital Government Technology
	<b>Class B Human Capital CSFs</b>	CSF 36 Communication Technology CSF 33 Technology Evaluation and Control System CSF 34 Intergovernmental Integration Technology
	<b>Class C Human Capital CSFs</b>	CSF 35 Customer Engagement Technology CSF 31 Customer Support and Service (CSS) CSF 32 Artificial Intelligence (AI) Technology

## The Interview Questions of the Acceptability and Usefulness of the Final Critical Success Factors (CSFs) Taxonomy to the Organisational Change Management

### Part A

Interview Areas	Strongly Disagree	2	3	4	Strongly Agree
1. Please rank your knowledge of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management.	1	2	3	4	5
2. The CSFs Taxonomy is appropriate and applicable for the Organisational Change Management of the NBTC.	1	2	3	4	5
3. The CSFs Taxonomy is valuable for implementing the organisational change plans.	1	2	3	4	5
4. The CSFs Taxonomy enhances the quality decision to be focused and precise, which helps the organisation achieve its goals and objectives.	1	2	3	4	5
5. The CSFs Taxonomy provides the knowledge of Organisational Change Management to sustain the future organisational change capability and success.	1	2	3	4	5

### Part B

1. Which contexts of the Final Critical Success Factors (CSFs) of the Organisational Change Management are not acceptable for you, such as ranked categorized factors ? Please feel free to address these concerns.

**Your input:** .....

2. Which parts of the Final Critical Success Factors (CSFs) of the Organisational Change Management do you want to replace or modify?

**Your input:** .....

## **Phase 2 : The Action Cycles and the Interview of Nine Participants**

The Development of the Redesign of the Business Process Management (BPM) and the Key performance Indicators (KPIs) Taxonomy of the BPM

### **Introduction**

The major objective of Phase two of this research aims to develop redesign of the Business Process Management (BPM) and the Key Performance Indicators (KPIs) Taxonomy of the BPM of the new combined broadcasting and telecommunications licensing bureau of the NBTC.

The validation of this study aims to verify acceptability and usefulness of the KPIs Taxonomy to the Business Process Management (BPM). Furthermore, the validation of the contribution of the KPIs Taxonomy to Knowledge Management (KM) is also included. In addition, the reliability of the KPIs Taxonomy is verified using the Analytic Hierarchy Process (AHP) through a priority scale from 1 to 9 (see table B4, appendix B). The expertise of the nine participants is applied to the validation and reliability methodology.

The expertise of the nine participants is applied to the validation methodology.

### **Action cycle 1 of phase 2 and Interview Questions**

The Development of the New Redesign of the Existing Business Processes of the Newly Combined Broadcasting and Telecommunications Licensing Bureau of the NBTC.

The action cycle 1 of phase 2 consists of four action steps, which can be summarized as follows:

**Action step 1: Review the Existing Business Processes:** The review aims to understand the existing business processes of the new combined broadcasting and telecommunications licensing bureau of the NBTC in order to use for the action step 2.

**Action step 2: In-depth interview of nine participants about existing business processes:** The in-depth interview of nine participants is conducted to seek for their inputs for the current problems or issues as well as suggestions for the existing business processes of the new combined broadcasting and telecommunications licensing bureau.

**Please kindly the answer the following interview questions.**

1. What do you think about the problems or issues of the existing business processes of the new combined broadcasting and telecommunications licensing bureau of the NBTC ?

**Your input:** .....

2. Please provide the ideas or suggestions for the redesign of the Business Process Management (BPM) of the new combined broadcasting and telecommunications licensing bureau of the NBTC that can solve the problems or issues of the existing business processes.

**Your input:** .....

**Action step 3: Refine problems, issues and suggestions of the existing business processes:** This step is to refine problems, issues and suggestions of the existing business processes of the new combined broadcasting and telecommunications licensing bureau from the inputs from the interview of nine participants.

**Action step 4: Develop the new redesign of the Business Process Management (BPM):** The action step 4 aims to develop new redesign of the BPM of the new combined broadcasting and telecommunications licensing bureau of the NBTC.

## **Action Cycle 2 of Phase 2 and Interview Questions**

The Development of the drafted KPIs Taxonomy of Business Process Management (BPM)

**Action step 1: Intensive literature review of the KPIs:** The insider researcher conducts the intensive literature review of the KPIs of the BPM and then develops the list of the initial potential KPIs of the BPM as shows in table B10.

**Action step 2 of Action Cycle 2 of Phase 2: In-depth interview of nine participants about initial potential KPIs of the BPM:** The action step 2 of action cycle of phase 2 aims to refine the list of the initial potential KPIs of the BPM from the literature review as well as the inputs from the in-depth interview of nine participants.

The initial list of the potential KPIs of the BPM is developed from the intensive relevant literature review as shows in table B10. Please review table B10 and kindly the answer the following interview questions.

1. Do you think that the initial list of the potential KPIs of the BPM that is developed from the intensive relevant literature review is acceptable and relevant to the KPIs of the BPM of the NBTC?

**Your input:** .....

2. Please provide additional comments or suggestions about the initial list of the potential KPIs that you might have.

**Your input:** .....

**Table B10** The List of the Initial Potential Key Performance Indicators (KPIs)  
Under Balance Scorecard (BSC)

<b>Perspectives Key Performance Indicators (KPIs)</b>	
<b>Financial perspective</b>	FP1 Net License Revenue per Employee (\$)
	FP2 Total asset per employees (No.)
	FP3 Profit on total assets (\$)
	FP4 Profit per employee (\$)
	FP5 Return on equity (ROE)
	FP6 Gross margin (%)
	FP7 Operating Expense per Total License Fees (%)
	FP8 Return on investment (\$)
	FP9 Internal rate of return (%)
<b>Customer (operator) perspective</b>	CP1 Market share (%)
	CP2 Customer satisfaction index (%)
	CP3 Corporate image index (\$)
	CP4 License fee per operator (%)
	CP5 Operators per employees (No. or %)
	CP6 Average time spent on operator relations (No.)
	CP7 Operator rating (%)
	CP8 Cost per operator (\$)
	CP9 Number of operator complaints (No.)

**Table B10** The List of the Initial Potential Key Performance Indicators (KPIs) Under Balance Scorecard (BSC) (Cont.)

Perspectives	Key Performance Indicators (KPIs)
<b>Business</b>	BPP1 Operating expense per total license fee (%)
<b>Process</b>	BPP2 License renewal time (No.)
<b>Perspective</b>	BPP3 On-time license service process (%)
	BPP4 Productivity Improvement (%)
	BPP5 Lead time, product development (No.)
	BPP6 Lead time, from order to delivery (No.)
	BPP7 Average time for decision-making (No.)
	BPP8 Average time of complaint handling (No.)
	BPP9 Operating expense per operator (%)
<b>Innovation</b>	IGP1 Training hours per employee (No.)
<b>and growth</b>	IGP2 Employee satisfaction index (%)
<b>perspective</b>	IGP3 Leadership development expense per employee (\$)
	IGP4 Employee turnover (%)
	IGP5 Investment in process innovation per license revenue (%)
	IGP6 Investment in knowledge management per operators (No.)
	IGP7 Suggested improvements per employee (\$)
	IGP8 Absenteeism rate (%)
	IGP9 Direct communications to operators/year (No.)

**Action step 3: Develop the drafted KPIs Taxonomy of the BPM:** This step is to adjust the proposed initial potential KPIs from the intensive literature review with the inputs from the interview of nine participants. The drafted KPIs Taxonomy of the BPM is further developed at this action step as shows in table B11.

**Table B11** Draft Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM)

<b>Performance Focused Area</b>	<b>Key Performance Indicators (KPIs)</b>
<b>Business Process Management (BPM)</b>	KPI 01. Net License Revenue per Employee KPI 02. Operating Expense per Total License Fees KPI 03. Customer Satisfaction Index KPI 04. License Renewal Time KPI 05. Productivity Improvement KPI 06. Ontime License Service Process KPI 07. Investment in Process innovation per License Revenue KPI 08. Employee Satisfaction Index KPI 09. Suggested Improvement per Employee

### **Action Cycle 3 of Phase 2 and Interview Questions**

The Development of the Final Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM)

#### **Instruction**

The purpose of the interview of action cycle 3 of phase 2 is to further develop the drafted Key Performance Indicators (KPIs) of the Business Process Management from action cycle 2 of phase 2 (table B11) through the priority ranking of the KPIs of the BPM. This action cycle consists of 4 action steps, but the in-depth interview of nine participants is conducted at the action step 2 of action cycle 3 of phase 2 as follows.

**Action step 2: Rank the final list of the drafted CSFs Taxonomy using AHP:** This step consists 1 question to in-depth interview with nine participants to rank the final list of CSFs using the statistical tool of the Analytic Hierarchy Process (AHP) through a priority scale from 1 to 9 (see table B4, appendix B) to pairwise to rank the Key Performance Indicators (KPIs) through the interview of the nine participants to be classified into three classes (1) class A (most important KPIs, (2) Class B (second most important KPIs), and (3) class C (third most important KPIs).

1. Please rank the priority of each categorized factor of the KPIs Taxonomy the Business Process Management (BPM) from table B11 using pairwise comparison scale for Analytic Hierarchy Process (AHP) from table B4.

**Your inputs:** .....

**Table B11** Draft Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM)

<b>Performance Focused Area</b>	<b>Key Performance Indicators (KPIs)</b>
<b>Business Process Management (BPM)</b>	KPI 01. Net License Revenue per Employee KPI 02. Operating Expense per Total License Fees KPI 03. Customer Satisfaction Index KPI 04. License Renewal Time KPI 05. Productivity Improvement KPI 06. Ontime License Service Process KPI 07. Investment in Process innovation per License Revenue KPI 08. Employee Satisfaction Index KPI 09. Suggested Improvement per Employee

**Table B4:** Pairwise comparison scale for Analytic Hierarchy Process

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Moderate importance	Experience and judgment slightly favor one activity over another
5	Strong importance	Experience and judgment strongly favor one activity over another
7	Very strong or demonstrated importance	An activity is favored very strongly over another; its dominance is demonstrated in practice
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order of affirmation
2,4,6,8	For compromise between the above values	Sometimes one needs to interpolate a compromise judgment numerically because there is no proper word to describe it

Source: Saaty, T.L., 2001, Decision Making for Leaders, RWS Publication, Pittsburgh

**Table B12:** Pairwise Comparison of the Key Performance Indicators (KPIs) of the Business Process Management (BPM)

Key Performance Indicators (KPIs): of the Business Process Management (BPM)	Ranking Priority																		Key Performance Indicators (KPIs): of the Business Process Management (BPM)
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9		
KPI 01. Net License Revenue per Employee																		KPI 02. Operating Expense per Total License Fees	
KPI 01. Net License Revenue per Employee																		KPI 03. Customer Satisfaction Index	
KPI 01. Net License Revenue per Employee																		KPI 04. License Renewal Time	
KPI 01. Net License Revenue per Employee																		KPI 05. Productivity Improvement	
KPI 01. Net License Revenue per Employee																		KPI 06. Ontime License Service Process	
KPI 01. Net License Revenue per Employee																		KPI 07. Investment in Process Innovation Per License Revenue	
KPI 01. Net License Revenue per Employee																		KPI 08. Employee Satisfaction Index	
KPI 01. Net License Revenue per Employee																		KPI 09. Suggested Improvement per Employee	
KPI 02. Operating Expense per Total License Fees																		KPI 03. Customer Satisfaction Index	

**Table B12:** Pairwise Comparison of the Key Performance Indicators (KPIs) of the Business Process Management (BPM) (cont.)

Key Performance Indicators (KPIs): of the Business Process Management (BPM)	Ranking Priority																Key Performance Indicators (KPIs): of the Business Process Management (BPM)	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
KPI 02. Operating Expenses per Total License Fees																		KPI 04. License Renewal Time
KPI 02. Operating Expenses per Total License Fees																		KPI 05. Productivity Improvement
KPI 02. Operating Expenses per Total License Fees																		KPI 06. Ontime License Service Process
KPI 02. Operating Expenses per Total License Fees																		KPI 07. Investment in Process Innovation Per License Revenue
KPI 02. Operating Expenses per Total License Fees																		KPI 08. Employee Satisfaction Index
KPI 02. Operating Expenses per Total License Fees																		KPI 09. Suggested Improvement per Employee
KPI 03. Customer Satisfaction Index																		KPI 04. License Renewal Time
KPI 03. Customer Satisfaction Index																		KPI 05. Productivity Improvement
KPI 03. Customer Satisfaction Index																		KPI 06. Ontime License Service Process

**Table B12:** Pairwise Comparison of the Key Performance Indicators (KPIs) of the Business Process Management (BPM) (cont.)

Key Performance Indicators (KPIs): of the Business Process Management (BPM)	Ranking Priority																Key Performance Indicators (KPIs): of the Business Process Management (BPM)	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	
CSF 03. Organisational Change Strategy																		KPI 07. Investment in Process innovation Per License Revenue
CSF 03. Organisational Change Strategy																		KPI 08. Employee Satisfaction Index
CSF 03. Organisational Change Strategy																		KPI 09. Suggested Improvement per Employee
KPI 04. License Renewal Time																		KPI 05. Productivity Improvement
KPI 04. License Renewal Time																		KPI 06. Ontime License Service Process
KPI 04. License Renewal Time																		KPI 07. Investment in Process innovation Per License Revenue
KPI 04. License Renewal Time																		KPI 08. Employee Satisfaction Index
KPI 04. License Renewal Time																		KPI 09. Suggested Improvement per Employee
KPI 05. Productivity Improvement																		KPI 06. Ontime License Service Process

**Table B12:** Pairwise Comparison of the Key Performance Indicators (KPIs) of the Business Process Management (BPM) (cont.)

Key Performance Indicators (KPIs): of the Business Process Management (BPM)	Ranking Priority																Key Performance Indicators (KPIs): of the Business Process Management (BPM)	
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8		9
KPI 05. Productivity Improvement																		KPI 07. Investment in Process innovation Per License Revenue
KPI 05. Productivity Improvement																		KPI 08. Employee Satisfaction Index
KPI 05. Productivity Improvement																		KPI 09. Suggested Improvement per Employee
KPI 06. Ontime License Service Process																		KPI 07. Investment in Process innovation Per License Revenue
KPI 06. Ontime License Service Process																		KPI 08. Employee Satisfaction Index
KPI 06. Ontime License Service Process																		KPI 09. Suggested Improvement per Employee
KPI 07. Investment in Process innovation per License Revenue																		KPI 08. Employee Satisfaction Index
KPI 07. Investment in Process innovation per License Revenue																		KPI 09. Suggested Improvement per Employee
KPI 08. Employee Satisfaction Index																		KPI 09. Suggested Improvement per Employee

## Interview Questions for the Validity of the Acceptability and Usefulness of the Final KPIs Taxonomy to the BPM

**Action Step 1 of Action Cycle 4 of Phase 2: Validate the acceptability and usefulness of the Final KPIs Taxonomy to the BPM:** The action step 1 of action cycle 4 of phase 2 aims to validate the acceptability and usefulness of the final KPIs Taxonomy to the BPM.

### Introduction

The Final KPIs Taxonomy of the BPM is developed from the action step 3 of action cycle 2 of phase 2, which are the most important ranking (high scale) from nine participants' opinions and are categorized into four categories as shows in table B13.

**Table B13** The Final Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) of the Office of The National Broadcasting and Telecommunications Commission (NBTC)

Performance Focused Area	KPIs Categories	Key Performance Indicators (KPIs)
<b>Business Process Management (BPM)</b>	<b>Class A KPIs</b>	KPI 5 Productivity Improvement
		KPI 3 Customer Satisfaction Index
		KPI 4 License Renewal Time
	<b>Class B KPIs</b>	KPI 1 Net License Revenue per Employee
		KPI 6 Ontime License Service Process
		KPI 2 Operating Expense per Total License Fees
	<b>Class C KPIs</b>	KPI 8 Employee Satisfaction Index
		KPI 7 Investment in Process Innovation per License Revenue
		CSF 6 Organisational Structure

**Interview Questions of Action Step 1 of Action Cycle 4 of Phase 2**

The interview of the participants aims to receive opinions and feedback to develop and validate acceptability and usefulness of the Final Key Performance Indicators (KPIs) of the Business Process Management (BPM) (Table B13). The interview will follow the five questions of part A below as well as be two open-end questions of part B for additional comments from the participants.

**The Final Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM)**

**Part A**

Interview Areas	Strongly Disagree				Strongly Agree
1. Please rank your knowledge of the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM).	1	2	3	4	5
2. The KPIs Taxonomy is appropriate and applicable for the Business Process Management (BPM) of the NBTC.	1	2	3	4	5
3. The KPIs Taxonomy is valuable for implementing the Business Process Management (BPM) plans.	1	2	3	4	5
4. The KPIs Taxonomy enhances the quality decision to be focused and precise, which helps the BPM achieve its goals and objectives.	1	2	3	4	5
5. The KPIs Taxonomy provides the knowledge of Business Process Management (BPM) to sustain future BPM capability and success.	1	2	3	4	5

**Part B**

1. Which contexts of the Key Performance Indicators (KPIs) of the Business Process Management (BPM) are not acceptable to you, such as Key Performance Indicators (KPIs)? Please feel free to address this and make comments.

**Your input:** .....

2. Which parts of the Key Performance Indicators (KPIs) Taxonomy of the Business Process management (BPM) do you want to replace or modify?

**Your input:** .....

## **The Validation of the Contributions of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) to the Organisational Change Management and Knowledge Management (KM)**

**Action Step 2&3 of Action Cycle 3 of Phase 1 and Action Step 2&3 of Action Cycle 4 of Phase 2**

### **Introduction**

The main purpose of the validation of the contributions of the of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and the Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) aims to seek benefits and contributions for the relevant management concepts and practices that include Organisational Change Management and Knowledge Management (KM). The Analytical Hierarchy Process (AHP) is applied to identify the priority of the Critical Success Factors (CSFs) of the Organisational Change Management and the Key Performance Indicators (KPIs) of the Business Process Management (BPM) and to further develop the final CSFs Taxonomy of the Organisational Change Management and the KPIs Taxonomy of the Business Process Management (BPM) respectively. The participants' expertise is used to provide comments on the validation process.

### **Interview Questions**

The main purpose of the interview is to seek the contribution of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) for the relevant management concepts and practice, which include Organisational Change Management and Knowledge Management (KM).

**The Contributions for the Organisational Change Management**

**Instruction**

Please answer the interview questions of part A and part B for the purpose of seeking your opinions about the contributions of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) to the Organisational Change Management.

**Part A**

1. Have you known and experienced Organisational Change Management? What is the definition of Organisational Change Management, according to your ideas?

**Ans:** .....

**Part B**

Questions	Strongly Disagree			Strongly Agree	
1. The Taxonomy provides the benefits to the Organisational Change Management	1	2	3	4	5
2. The Taxonomy is beneficial for the organisation to analyze the change impact and to further develop the impact of organisational change strategy effectively.	1	2	3	4	5
3. The Taxonomy provides the benefits for the top management to predict and prepare for future change more precisely.	1	2	3	4	5
4. The Taxonomy provides the organisation to seek for opportunities for organisational change.	1	2	3	4	5
5. The Taxonomy provides the organisation to change the organisation to become more competitive.	1	2	3	4	5

## **The Contributions to Knowledge Management (KM)**

### **Instruction**

Please answer the interview questions of part A and part B for the purpose of seeking your opinions about the contributions of the Critical Success Factors (CSFs) Taxonomy of the Organisational Change Management and Key Performance Indicators (KPIs) Taxonomy of the Business Process Management (BPM) to the Knowledge Management (KM).

### **Part A**

1. Have you had knowledge and experience of Knowledge Management (KM)? What is the definition of Knowledge Management (KM) according to your ideas?

**Ans:** .....

### **Part B**

<b>Questions</b>	<b>Strongly Disagree</b>				<b>Strongly Agree</b>
1. The Taxonomy provides the benefits for the Knowledge Management (KM) for the organisations to transfer the knowledge of the Organisational Change Management and Business Process Management (BPM).	1	2	3	4	5
2. The Taxonomy helps develop the central knowledge for the entire organisations for future Organisational Change Knowledge Capability.	1	2	3	4	5
3. The knowledge development of the Taxonomy enhances the ability to achieve the organisational goal and objectives.	1	2	3	4	5
4. The knowledge of the Taxonomy enables the organisation to improve its capability to regulate, as well as to promote the broadcasting and telecommunication industries.	1	2	3	4	5
5. The knowledge of the Taxonomy enhances the improvement of organisational productivity	1	2	3	4	5