Developing and Managing Performance Tree - A New Performance Management Framework

By

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Declaration

I declare that the work in this dissertation was carried out in accordance with the Regulations of the University of Kent. The work is original, except where indicated by special reference in the text. Any views expressed in the dissertation are those of the author and in no way represent those of the University of Kent. The dissertation has not been presented to any other University for examination either in the United Kingdom or overseas.

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Abstract

Performance management has been widely applied as a critical operations management tool in modern organisations. A significant number of organisations that establish their performance management systems facilitated by the performance management framework(s) have achieved great success. With the development of economy and society, new industries and new business models are continually emerging. In this fast-changing new environment, performance management practices based on traditional performance management frameworks gradually show their limitations. Modern firms have a compelling need for more effective and flexible performance management frameworks to help them improve their organisational performance. To echo the call for more effective performance management frameworks, this doctoral thesis focuses on developing a new performance management framework that can help and facilitate modern organisations to set up an effective performance management system to improve their existing performance management.

Based on the initial understanding of the root causes of the deficiencies in traditional performance management, which is the widely applied action-oriented performance definitions, this study aims to answer three interrelated research questions to achieve the research goals.

1) How to redefine performance and develop the related basic concepts in order to help build up a more flexible and comprehensive performance management framework?

2) How to develop a flexible and comprehensive performance management framework based on the new definition of performance, which is not only concentrated on action and process?

3) What are the feasible and practical approaches to implement the new performance management framework in real applications?

First, this study develops a new definition of performance based on Critical Realism and further reconsiders the concepts of organisational performance and performance management based on the new performance definition. Subsequently, a new performance management framework, namely Performance Tree Management Framework is proposed that intends to enhance organisations' performance by developing performance tree with key causal factors, interacting

with organisational objectives and strategies, and then managing the performance tree by using global coordination.

This study further discusses how to develop and manage the performance tree using specialisation and global coordination by cross-referencing literature. A set of five global coordination approaches are proposed: 1) Global coordination for accomplishment; 2) Global coordination by standardisation; 3) Global coordination by global mutual adjustment; 4) Global coordination by KPIs/OKRs and performance planning; 5) Global coordination by feedback.

Finally, to empirically apply the framework, two case studies are carried out in China. The results of the case studies show that the Performance Tree Management Framework is feasible in practice and can help to develop a tailored and flexible performance management system for a particular organisation, especially for achieving its mid-and-long term objectives.

Keywords: Performance, Performance management, Performance management framework, Design and use performance management system, Critical Realism (CR)

Contents

List of Figures

List of Tables

Chapter 1 Introduction

1.1 Background

Performance management is widely applied in different sectors and organisations and often plays a critical role in the operational process of an organisation for fostering employee or organisational performance (Bititci et al., 2012; Cuccurullo, Aria and Sarto, 2016; Zheng *et al.*, 2019; Laitinen and Kadak, 2019). Both practitioners and scholars acknowledge the importance of performance management, which can be reflected by its popularity in industry and academia. The available data indicates that the percentage of using performance management in organisations has reached 90% in the United Kingdom (Brewster, Sparrow and Vernon, 2007), and the percentage in Greece, Sweden, Ireland and Germany are 88%, 88%, 84% and 81% respectively (McMahon, 2009). According to the "Chinese Enterprise Human Resource Management Survey in 2004" conducted by the Development Research Centre of the State Council (DRC, 2004), 67.3% of companies in China used performance management.

In terms of research, performance management field has attracted great interests from many different disciplines, including Human Resource Management (Van De Voorde, Paauwe and Van Veldhoven, 2012; Aguinis, Joo and Gottfredson, 2012), Accounting (Otley, 1999; Ferreira and Otley, 2009), Finance (Manville and Greatbanks, 2013), Operational Research (Smith and Goddard, 2002; Liu *et al.*, 2012; Wang, Liu and Mingers, 2015), Strategy (Freeman, 2010; Vieira, O'Dwyer and Schneider, 2017; Pollitt, 2018), Psychology, Quality Management (Psomas and Jaca, 2016; Paraschi, Georgopoulos and Kaldis, 2019), and Information Technology (Sharif, Irani and Lloyd, 2007), along with cognitive, clinical, social, and behavioural psychology, neuroscience (Pulakos, Mueller-Hanson and Arad, 2019).

Moreover, a lot of organisations introduced performance management have achieved success in the past three decades. For instance, an excellent investigative study conducted by the Sunday Times also argued that performance management was one of the most crucial managerial processes leading to the success for enterprises in the United Kingdom (Aguinis, Joo and Gottfredson, 2011). Two years after Mobil Oil starts performance management, it

moves from the last place to the first place in industry profitability in 1995 and, maintains that position for the next four years (Landry, Chan and Jalbert, 2002). By the early 2000s, as many as 60% of the Fortune 500 organisations are using performance management (Peter and Anna, 2016).

By studying these successful cases, many scholars believe that certain types of performance management framework can help to develop a performance management system and critically contribute to the success of performance management, such as Mobil Oil adopts Balanced Score Card (BSC) (Kaplan and Norton, 1992; Otley, 1980; Armstrong, 2006; Molleman and Timmerman, 2003). The performance management frameworks often emphasis the designs inter-linkages of each component to support each other and provide guidance for implementing performance management throughout the organisation (Andersen, Henriksen and Aarseth, 2006). Therefore, a successful performance management practice in an organisation often relies on an excellent performance management framework for designing a compatible performance management system and effective utilisation of this system (Kaplan and Norton, 1996; Rompho and Boon-itt, 2012).

In order to facilitate the success of performance management, a wide range of performance management frameworks have been developed. Each of them often has a logical order of components, both explicitly and implicitly (Zheng *et al.*, 2019). The frameworks also provide guidance on how to design actions and processes aiming to enhance organisational performance to facilitate the establishment of desired performance movement system in various organisations (Bititci *et al.*, 2018). Typically, the most representative and popular performance management frameworks are the BSC and strategy map (Kaplan and Norton, 2004), the European Foundation for Quality Management (EFQM) excellence model (EFQM, 2013), Otley's five questions framework (Otley, 1999) and Ferreira and Otley's twelve questions extended framework (Ferreira and Otley, 2009). They are often widely accepted and considered effective in organisation management.

When the world enters from the industrial era to the early 21st century, fast-changing technology and information bring great opportunities and challenges to existing organisations, especially for those business enterprises that face new rules of the competition. Therefore, contemporary organisations should put more emphasis on the creation of the knowledge and the need to respond quickly to the growing uncertainty in business operation. Under current circumstances, firms increasingly find previous management systems, including performance management systems that used to work well, decrease their effectiveness in this new

environment (Stivers and Joyce, 2000). More evidence shows that performance management is not always successful, especially in recent years (Pasha and Poister, 2019). According to Mercer's 2019 global performance management survey on 1154 managers all over the world and Mckinsey & Company's online survey with 1761 samples, from the full range of regions, industries, organisational size in 2018, a considerable number of the responses showed that their existing performance management systems were neither able to achieve enough effect on overall performance enhancement nor provide increasing business results as expected (Chowdhury, Hioe and Schaninger, 2018; Mercer, 2019).

One of the key reasons of the above issue in modern performance management is that the traditional performance management frameworks are less effective to reflect the managerial demands in the fast-changing environment that often includes intensive evolution of organisational structure and business model, the rapid development of information and technology (Zheng, 2017). Many scholars argue that the traditional performance management frameworks are often inflexible, sometimes even counterproductive, for the contemporary businesses and organisations as those frameworks were mostly developed for organisations in a stable environment and usually for the labour-intensive industries, such as the manufacturing industry (Franco-Santos, Lucianetti and Bourne, 2012a; Nudurupati, Tebboune and Hardman, 2016; *Melnyk et al.*, 2014). Thus, for achieving successful performance management and combating increasing competition and uncertainty of the rapidly evolving business environment, a good and up-to-date performance management framework could be the first thing for an organisation to obtain, which helps them improve performance management (Schrage *et al.*, 2019; Prouska, Psychogios and Rexhepi, 2016; Joensuu-Salo *et al.*, 2018).

1.2 The motivation of the research approach

In the past years, scholars have devoted their energies to developing different performance management frameworks to advance the development of performance management research and practice, such as Zheng et al.'s (2019) balanced stakeholder performance management framework for the public sector, Lu et al.'s (2019) integrative performance management framework for service supply chains, Adivar, Hüseyinoğlu and Christopher's (2019) quantitative performance management framework for assessing omnichannel retail supply chains, Tseng and Levy's (2018) multilevel leadership process performance management

framework, Wadongo and Abdel-Kader's (2014) theoretical performance framework for organisational effectiveness in the third sector, Bao et al.'s *(*2013) value-based global performance management framework for public management, etc. Most of the existing studies have tried to develop performance management framework relating to different sectors or focus on certain aspects of performance management, and yet an ideal performance management framework that can provide a perfect solution is still in blurry shape. Therefore, this study aims to develop a new performance management framework that can help and facilitate modern organisations to carry out flexible and effective performance management.

Most of the existing performance management frameworks are based on the in-role action or processes which is related to the job/task performance (Griffin, Neal and Parker, 2007; Hawkes and Weathington, 2014). In other words, the traditional performance management frameworks often emphasise on managing designed actions or processes according to the organisational objectives and strategies. These action/processes oriented performance management frameworks often ignore the non-behavioural factors that are actually very important to the desired organisational performance (Never, 2016), such as human factors, environmental influences, and policy impacts, etc. For instance, it is almost impossible to achieve objectives through predetermined behaviours in the Research and Development (R&D) sector because of the complicated research process and contingent situations. For such a sector, the competence and proactive capabilities of individuals and teams could be the key elements for achieving research objectives and enhancing organisational performance (Jin and Sun, 2010). To some extent, the neglection of the non-behavioural factors in traditional performance management frameworks cause issues of their applications in real situations (Hung, 2017). Hence, in the current performance management practices, people often add more managerial contents such as culture, belief, and values, to compensate for the missing parts for achieving performance management goals, especially for the emerging organisations whose core operation features have shifted from standardisation, mass production, stabilisation to learning, innovation, agility and suitability (Mehralian, Nazari and Ghasemzadeh, 2018; Rajapathirana and Hui, 2018).

In line with the traditional performance management frameworks, the existing performance definitions also have action/process-orientated characteristics. Unless in a specific situation, people often define performance from the action aspect (Murphy and Kroeker, 1988; Campbell, McHenry and Wise, 1990; Dubnick, 2005; Burns and Baldvinsdottir, 2005; Lebas and Euske, 2002; Entchelmeier, 2008), the outcome aspect (Kane and Kane, 1992; Dwight, 1999; Krause and Mertins, 1999; Faulk, 2002; de Waal, 2003; Hall, 2003; Kenny and Bourne, 2015), or their

combination (Brumback, 1988; Mwita, 2000; Liu *et al.*, 2010; Qi, 2010; Zheng, 2017). Few definitions have referred to other aspects apart from the above two. Managing action/process may help the organisation to realise its short-term objectives and strategies but may not able to cope with its middle-to-long term objectives and strategies. Meanwhile, it is always challenging to predetermine the specific activities and processes in the long run for achieving the organisational objectives and strategies. To achieve the proposed outcomes of performance, not only actions but other factors, such as staff, capability, organisational culture, regulation, internal and external environment, religious faith, good intentions, might have their own important contributions (Hartinah *et al.*, 2020; Payer-Langthaler and Hiebl, 2013; Payer-Langthaler and Hiebl, 2013). Therefore, this study argues that traditional performance definitions need further development for improving its application for wider practices. In this sense, the issue of the existing performance definitions could have restricted the broader development in the performance management framework both in practice and research (Bititci *et al.*, 2018).

Based on the broad premise that sound research should be built on well-defined concepts (Lai and Li, 2016; Shepherd and Suddaby, 2017), the current conceptual problem of performance definition needs to be improved. Therefore, it is essential to start with redefining performance as a foundation for achieving the proposed research objectives. This study hence can be regarded as a response to the call for advancing fundamental theory for the performance and performance management research and practice (Bourne, Melnyk and Bititci, 2018; Bititci *et al.*, 2018).

1.3 Research objectives and questions

The objectives of this study are first to clarify and redefine the concepts of performance and performance management by exploring the nature of performance in management area, then to develop a new performance management framework that is built on the result of the definitions of performance and performance management, finally, to revise and improve the overall performance management theory by applying the new performance management framework in real business cases.

This thesis tries to answer the following three research questions:

The first question is "**How to redefine the performance and develop the related basic concepts in order to help build up more flexible and comprehensive performance management framework?** (RQ1)".

The second question is "**How to develop a flexible and comprehensive performance management framework based on the new definition of performance, which is not only concentrated on action and process?** (RQ2)".

The third question is "**What are the feasible and practical approaches to implement the new performance management framework in real applications?** (RQ3)".

1.4 Research procedure

This study mainly focuses on developing a new performance management framework to address the pressing issues in the performance and performance management fields. For achieving this aim, the research starts from redefining the definition of performance with causality and developing related basic concepts that draw support from one of the philosophical theories, i.e. Critical Realism (CR). Then, by profoundly studying the conceptual contents of the performance and performance management underlying the new definition of performance, combing with the literature studying on the characters of performance management, a new Performance Tree Management Framework is developed. In addition, for the empirical part, the case studies have been carried out in emerging knowledge-intensive industry rather than traditional labour-concentrated industry. Specifically, the case studies take place both in an individual firm and a group of firms to apply and improve the new performance management framework and underlying performance theory.

1.5 Research paradigm and methodology

The aim of PhD research is to develop new knowledge in the relevant research area. In this sense, "what is knowledge" is the most fundamental philosophical issue that PhD students have to face (Willis, Jost and Nilakanta, 2007). It is not an easy question because the definitions of knowledge have various contexts and are changing over the years. The reason is that different research areas have different research paradigms with various philosophical assumptions. For

instance, the main philosophical view of knowledge is that it is a type of belief that can be justified and is actually true (Pollock, 1974). Explaining the paradigm by philosophical assumptions from the ontological, epistemological, methodological and axiological aspects, researches can develop a holistic view of what knowledge is, what is the relationship between people and knowledge, what methods will be used to develop this knowledge (John W. and Vicki L., 2011). Awareness of philosophical assumptions will increase the quality of PhD research and can help researchers to enhance their creativity (Mark, Adrian and Philip, 2009). Moreover, the philosophical paradigms would determine the research path, and the results of the research will also be affected eventually. Therefore, the philosophical issues and paradigms that underlie this research will be discussed in this section.

From philosophical and scientific perspectives, all research depends on particular philosophical assumptions. Ponterotto (2005, p.127) pointed out the importance of philosophical foundations of a piece of research is "the conceptual roots undergirding the quest for knowledge". In Kuhn's influential book "The Structure of Scientific Revolutions", paradigm as an important and powerful term means "the entire constellation of beliefs, values, techniques shared by the members of a given community" (Kuhn, 1962, p.175). Based on Kuhn's description of paradigm, Burrell and Morgan (1979, p.23) defined it as "a term which is intended to emphasise the commonality of perspective which binds the work of a group of theorists together in such a way that they can be usefully regarded as approaching social theory within the bounds of the same problematic". Later, Ponterotto (2005) proposed that a paradigm is a philosophical assumption or a philosophical view that can be shared among scholars. Moreover, this philosophical assumption or view can provide a framework and a guide for the scholars to select tools, instruments, participants and methods that are going to be used in their study. More specifically, Mingers (2003) proposed that paradigm is an architecture of ontology, epistemology, ethics or axiology, which represent a general set of philosophical assumptions specified by scholars.

It is important for scholars to persist with an analysis of paradigms in social science. First, the paradigm can be seen as a model or a knowledge system. The scholars can understand what the discipline is about and how the discipline has come about from it. Second, the comparison of different paradigms can help control the deviations of research (Kuhn, 1962). There now exist various paradigms in the social research area, such as positivist/functionalist, interpretivist/constructivist, critical, post positivist, pragmatism, structuralism, feminism, CR, structuration theory, deconstructionism, etc. Among them, positivist/functionalist,

interpretivist/constructivist and critical paradigms are widely discussed and used. The conceptual frameworks of three paradigms are based on a different philosophy.

Positivist believes that all social phenomena are governed by universal laws. Scholars' objectives are to discover these laws and use this philosophy to interpret, foresee, and control social phenomena. Therefore, it has a realist ontology, an objectivist epistemology and an experimental or hypothesis-driven methodology (Guba, 1990). Interpretivist argues that the realities cannot be directly accessed but only can be interpreted. Scholars often aim to obtain an empathic understanding of human cultural behaviour by understanding the values, beliefs and meanings of social events (Smith and Heshusius, 1986). Hence, it has a relativist ontology (Guba and Lincoln, 1994), a subjective epistemology (Grix, 2004) and a methodology driven by case studies and engagement (Creswell, 2009).

Criticism recognises the existence of both external social structures and individual beliefs and understanding. It emphasises on explaining social inequities and believes that individuals can change injustices by taking actions (Comstock, 1982). Thus, the critical paradigm has a historical ontology (Guba and Lincoln, 1994), a subjective epistemology (Scotland, 2012) and a methodology driven by interrogating values and assumptions (Crotty, 1998).

In addition, the paradigm with mixed methods in research is rapidly developed in recent years. It is still a controversial issue in paradigm studies. Some scholars argue that mixed methods researchers should embrace multiple paradigms, which is known as Paradigm Pluralism (Johnson and Onwuegbuzie, 2004). There are different views on there being multiple paradigms: 1) imperialism: there should only be one dominant paradigm; 2) pragmatism: use whichever one works, different paradigms are appropriate for different problems; 3) weak pluralism: "let many flowers bloom"; 4) strong pluralism, multi-methodology, mixed methods: people should always combine methods from different paradigms.

CR paradigm is a relatively new approach, which has fundamental tenet that people can use causal language to describe the world (Easton, 2010). Because this paradigm would underlie this research, a brief introduction of CR is provided below.

1.5.1 Critical realism

In response to the anti-realist development in philosophy, the CR is developed in the 1970s. First, CR accepts a realist view of being as its ontology and accepts the relativism of knowledge under the social and historical condition as its epistemology. Second, CR believes there is a

modified naturalism in social science. Third, CR developed the idea of explanatory critique as a way of reuniting facts and values and, recognising that social theory is inevitably transformative (Mingers, 2000b). CR proposes a three-level model of the reality, which includes real level domain, actual level domain and empirical level domain (see Figure 1-1).

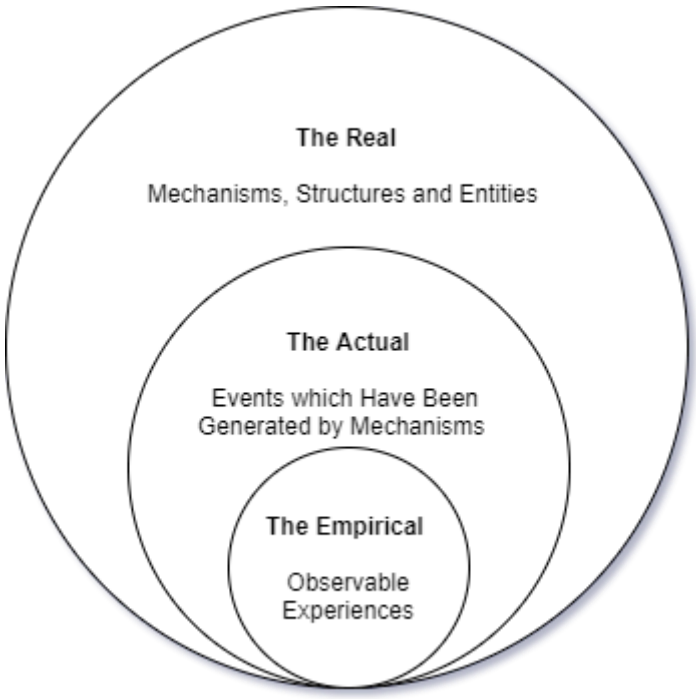


Figure 1-1 Three layers of reality in Critical Realism (adapted from Mingers and Standing, 2017)

The layer of real represents the whole reality. It is an intransitive domain of science, which is constituted with mechanisms and structures. The real is independent of the world that people can perceive and experience. The elements in the layer of real caused events or non-events in the layer of actual by casualty mechanism. The events that people actually observed and experienced then be named as the layer of empirical. The empirical events are a small part of the actual as they based on people's observations or experiences. From the perspective of CR, the layer of empirical is not as same as the reality that people think traditionally. It emphasises the relationship between the actual domain and human's experience(Mingers and Standing, 2017).

One of the critical components of real is mechanisms, which sometimes generate an event. These events become an empirical fact when they are experienced. By focusing on ascertaining

underlying mechanisms of empirically observable events, critical realists can gain knowledge of the relationship among things (Danermark *et al.*, 2001).

In terms of the causality, CR argues that the method necessity of causal relationship is observed, proved and generated by empirical observation of events with large and quantitative data sets. This method perceives numerical relationships about the social world in a 'closed' way, disregards the independent role(s) of broader context(s), which social phenomena cannot be arbitrarily separated from its social contexts. Critical realists believe that an explanation of causality is related cannot be elicited through a deductive, positivist approach, because the organisational world is continuously changing and developing, which also can be seen as an open system. Furthermore, it will be affected by a complex array of influences, that often involves human, substance, knowledge, mechanism, power, social architecture and even thoughts. These contexts change both temporally and geographically, often in unexpected ways. Thus, when people discover a particular type of causality, they should specify under what conditions it might be the case, as a number of contextual factors (Edwards, O'Mahoney and Vincent, 2014).

1.5.2 Methodology

The methodology often used in CR paradigm is either retroduction or abduction. Abduction emphasis on inferencing to the best explanation and retroduction is to identify the causes and conditions of one's findings. Retroduction means moving backwards and often involves four steps of the research process. Bhaskar summarised a four-step method for CR: 1) description, 2) retroduction, 3) elimination, 4) identification (DREI) (Price and Martin, 2018).

Step one: description.

In this step, the scholar first proposes an opinion or theory based on the studied phenomena. This opinion or theory often is believed theoretically significant, and often relevant to some specific theories or concepts.

Step two: retroduction.

Then, the scholar proposes one or a set of hypothetical mechanisms which are belied to generate the studied phenomena. These hypothetical mechanisms are often in the form of structure, in which the components could be observable or unobservable, such as physical entities, social,

psychological and conceptual mechanisms. This observable or unobservable structure is believed to eventually generate an observable event (e. g., the studied phenomena).

Step three: elimination.

After that, the scholar carries out experimental activities to demonstrate the existence of the proposed mechanisms/structure. In the process, the scholar needs to eliminate alternative explanations for generating the studied phenomena as much as possible. It worth noting that the prediction of relevant phenomena or events can be used to support the proposed mechanisms/ structure in CR.

Step four: identification.

Finally, the scholar identifies the mechanisms that are examined as correct via the above three steps and then develops them into a theory. When implementing this method, people look for what must the world be like for their observations. The equally important thing is what must it be like for the events they have not discovered. There is more not happening in the world than there is happening. It might give the researchers insights into the mechanisms or contexts that allowed this state of affairs when people ask why certain things have not happened.

1.5.3 Justify the paradigm selection

Performance management attracts the attention of a vast of researchers from different domains to explore what exactly performance is and how to enhance performance. The scholars posed various questions in their researches, such as, “what is the objective of performance management?” (Yuan *et al.*, 2020); “What is the content and core focus of performance management?” (De Waal and Gerritsen-Medema, 2006); “Are there unique characteristics in performance management?” (Striteska, 2012); “Can performance management be a real science discipline?” (Brudan, 2010); “Is it possible to have a meta-theory of performance management that could be universally applicable?” (Denisi and Murphy, 2017).

Many of the performance management researches often adopt a positivist/functionalist paradigm, which focuses on cause-and-effect relationships and, adopting statistical testing and linear thinking (Latham and Pinder, 2005). The scientific management theory influences the ontology and epistemology of the positivist paradigm in performance management research, which means 'best' practice can be explored by using quasi-natural science methods. Positivist paradigm assumes that actors and agents constitute the real world. Statistical validity and

reliability can be used to understand and measure the real world and its effects (Hallebone and Priest, 2009). In performance management, the positivist paradigm assumes that performance is identifiable, definable and measurable, and some specific processes can enhance performance. Thus, causal relationships among different dimensions or variables in a performance management system can be uncovered or discovered in a systematic way (e.g. Barnabè and Busco, 2012). The emphasis of the positivist paradigm on seeking to prescribe ways in which managers can better control the outcomes of work in organisations has contributed to the performance management research and practices from a managerialism perspective (McKenna, Richardson and Manroop, 2011).

While interpretivist and critical paradigms are quite different from the positivist paradigm. Interpretivists argue that performance management processes and systems operate within complex human systems and in mysterious ways (McKenna, Richardson and Manroop, 2011). It especially highlights the impact of performance from the employee perspective, which is not manipulated or manufactured by the manager. In performance management, it is vital to know what employees make their performance management initiatives. Interpretivist and Critical approaches with a rich and organised system of critical knowledge, provide another valid method in performance management research, like those proposed by managerialism researchers.

Based on literature and several investigations in the real organisations, this study realises that performance management in the real world is much more complex than that is understood in theory. It is impossible to fit into a specific mathematic or computing model simply. More variables should be considered in performance management, such as regulation, resources, stakeholders' interests, culture, etc. Even though it is impossible to exhaust all the dimensions of performance by this method. In reality, a performance management system in an organisation is not a closed system within the boundary of the organisation. It is an open system that includes not only the internal environment but also the external environment. The operations and results of a performance management system will be affected by the interactions of various elements, such as people, resources, management styles, current economy, industrial policies, etc. Therefore, the ontology of performance could be seen as a combination of two dimensions, i.e. transitive and intransitive, according to the view of ontology in the CR (Cruickshank, 2004). The former refers to the results individuals and organisations obtain, which can be developed with the change of internal and external conditions, such as the interest of key stakeholders. The latter refers to the object of performance, that is, the objective

existence of things with internal structure and mechanism, which are independent of social practice. As part of this study is to reconceptualise the performance and its related concepts, this study supposes that cause-and-effect/causality of a certain philosophy might be a bridge to carry out the study.

The concept of the three-level domain of reality in CR (i.e. real, actual and empirical) is particularly suitable for the performance management research, which concerns both theorisation and practice in the social environment (Mingers and Standing, 2017). Hence, the CR paradigm is used for this research. Specifically, the new performance management framework that this study aims to develop not only emphasises on the elements of action and process but focuses on identifying the other factors that can facilitate or realise the organisation's desired outcomes by operation process as well. The causality in CR can shed light on how to comprehensively analyse the cause-and-effect phenomenon in an organisation.

Although this study argues that the CR paradigm is suitable for performance and performance management research, researches should keep an open mind of philosophical issues and paradigms when considering the research approaches. Mingers and Brocklesby (1997) indicated that in order to make the most effective contribution in dealing with the complexity and diversity of the real world. It is desirable to go beyond using a single methodology but combining various methodologies generally (Creswell, 2009). The methodologies can be in whole or in part and from different paradigms. It is better to extend beyond the CR paradigm for seeking a greater depth of understanding of performance management theory and practice (Mingers and Brocklesby, 1997).

1.6 Thesis structure

The overall arrangement of this thesis is illustrated in Figure 1-2. There are five main parts covering eight chapters. Part one: introduction; Part two: literature review; Part three: theoretical development; Part four: empirical research; Part five: conclusions, contribution and future research.

Chapter One covers the research background, research goals, research questions, research scope and the structure of this thesis. The issues of research paradigms and the CR paradigm

that is underlying this thesis are also discussed, as well as the explanation of the proposed methodology for this research.

Chapter Two reviews the literature of the performance concept in the management area, which includes the evolution and performance management development, the contents of performance and the existing definitions of performance. This review Chapter clarifies with the problems of existing definitions of performance and the research gaps for performance management study.

Chapter Three further systematically reviews the literature surrounding performance management concepts and performance management frameworks. In addition, a traditional performance management mechanism, coordination, is reviewed.

In Chapter Four, new definitions of performance and performance management are inductively developed. Meanwhile, some related key elements are also conceptualised, such as performance unit (actual and virtual), performance network, performance tree, performance set and performance map. Further, this study proposes a new performance management framework, i.e. Performance Tree Management Framework.

In Chapter Five, examples are applied to explain how to develop and manage performance tree using specialisation and global coordination in details. Then, the significance of the new performance management framework is discussed. Finally, some groundwork for implementing the Performance Tree Management Framework in practice are discussed.

Chapter Six includes the first case study at the SW Institute, a new type of international innovation centre in China. The case study develops performance management approaches for the enhancement and consolidation of the existing performance management system and achieving the objective of social impact by utilising the new Performance Tree Management Framework.

Chapter Seven covers the second case study in eleven Chinese venture capital firms. This case study designs an effective sub-performance management system aiming to achieve and enhance the financial objective of this group of firms.

In Chapter Eight, the conclusion, contribution, limitation of the thesis are discussed. Some future research outlooks are also discussed at the end of this chapter.

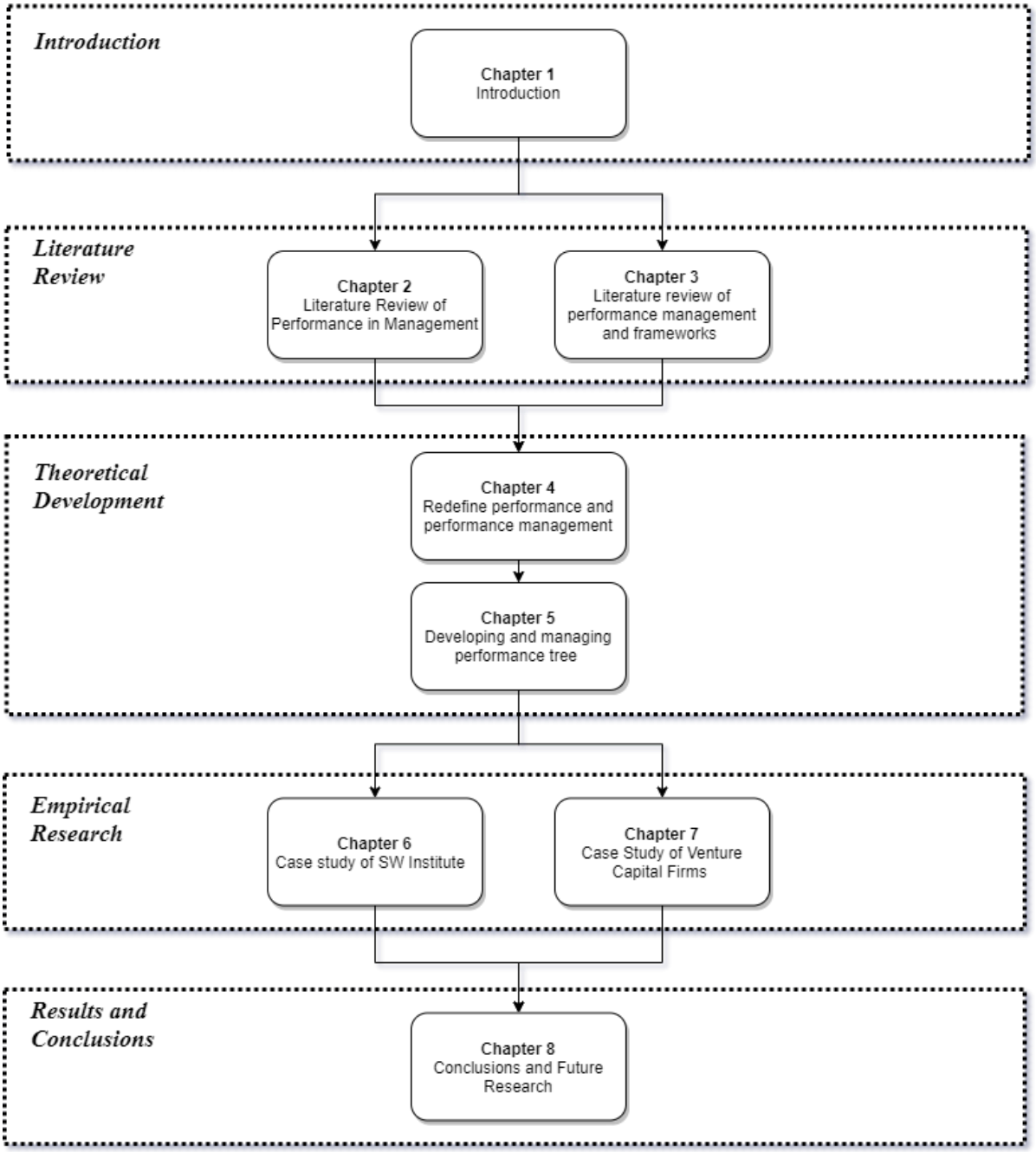


Figure 1-2 Thesis structure map

Chapter 2 Literature Review of Performance in Management

This chapter provides a literature review of the research on performance in the management context, especially on the contents of performance in performance management practice, and their definitions both in a general and specific level. The review starts with a précis of the evolution of performance management, which could help this study gain the awareness of the development and trends of modern performance management practice, and the diversification of the contents of performance over time. A review of literature is then provided around the concept of performance, starting from its diversified contents to the existing definitions. The current state of conceptualisation on performance is then discussed to identify the research gaps for this performance management study.

2.1 The evolution of performance management

The arising of performance management has been extensively discussed in the literature (Talbot, 2009; Brudan, 2010; Bititci, 2015). Most people believe it is the consequence of the development of integrated performance measurement in response to the emergence of global competition and sophistication of markets, and to maintain effectiveness in a continually changing environment (Bititci *et al.*, 2012). In this sense, the origins of performance management in organisation and business management area can be traced back to the thirteenth century, when the Florentine businessmen created a double-entry accounting system (an accounting method of registering each commercial business in two or more interconnected accounts at the same amount, the most common type are credit and debit) in order to conduct their business activities efficiently (Johnson, 1981). In this early stage of performance management evolution, people mainly focused on performance measurement, which was also sometimes known as performance rating. Performance measurement aimed to obtain accurate ratings of individual performance or organisational performance. For instance, the bookkeeping such as the double-entry accounting was the only and popular performance measurement technique in the 1760s, which could assist management by assessing profitability

and financial condition in numbers (Edwards, Dean and Clarke, 2009). From the late 1800s to 1900s, the principal area of concern in performance measurement was budgeting mostly, and thus, the contents of the performance were straightforward and simple, i.e. cost and revenue almost (Bititci, 2015).

In terms of modern performance management practice, people believe it begins to take shape from the start of the Industrial Age with Frederick Winslow Taylor (1911) because most of modern management concepts and methods are developed from practices adopted with the industrialization of the world economy (Bititci *et al.*, 2012). Since then, performance management practice experienced continuous evolution over times and global trends (Bititci, 2015).

2.1.1 Performance management since the Second Industrial Revolution to 1980s

In 1911, Frederick Winslow Taylor's landmark publication, 'The Principles of Scientific Management', marked the naissance of the subject of management. People increasingly used performance measurement to control and drive higher employee performance (Murphy and Cleveland, 1995). The focus of performance measurement gradually shifted from finance success to employee productivity based on the scientific management theory (Taylor, 2011) since the early twentieth century until the late 1980s. The performance management practice in this stage often concerned improving productivity through industrial engineering methods, which were studied in management accounting, operational monitoring and control, operational decision making, etc. (Bititci, 2015). Hence, the contents of performance in performance management started to involve more elements besides the financial outcomes. The most common elements were those that could be directly controlled and managed to achieve the desired financial outcomes, which were action and process almost (Zheng, 2017).

For example, in the 1960s, measuring and rating work behaviours of employees gradually became the core point of performance management (Latham and Wexley, 1977). Many variants of behavioural measurement methods were designed and evaluated over the next 20 years. Until the 1980s, scholars noticed that using behavioural measurement only was inadequate as no rating format could actually reflect the demand for performance management (Landy and Farr, 1980; Murphy, Martin and Garcia, 1982).

In addition, in the idea of management by objectives (MBO) that was popularised by Peter Drucker in his 1954 book "The Practice of Management" (Drucker, 1954), gradually generated

a vital impact on modern performance measurement and performance management. The MBO method is a managerial process of defining a range of particular goals within an organisation, which management can transmit them to all the departments and staffs, then develop the approaches and processes to achieve each objective in a particular order (Mio, Venturelli and Leopizzi, 2015). One of the critical processes of MBO method is measuring and comparing the employee's actual performance with the standards sets (Drucker, 1954). Inherently, the MBO method can be adopted to motivate employees to realize organisational objectives and enhance performance, productivity to achieve desired results. The introduction of the MBO method into performance measurement and performance management makes the process of managing performance more structured and effective (Islami, Mulolli and Mustafa, 2018). Adopting job-relevant performance objectives to define, control, communicate and evaluate employee performance mainly through setting goals and assessing the corresponding outcomes, remains a most common feature in the modern performance management processes since then (Pulakos, Mueller-Hanson and Arad, 2019). For example, the MBO method alone was by far the most dominant type of performance management practice in both the 1990 and the 1995 Australian Human Resources Institute (AHRI) studies (70% and 68%) (Nankervis, 2006). Moreover, some scholars believe that the new public management (NPM) reform could be another important origin of performance management (Bouckaert and Halligan, 2008).

2.1.2 Performance management from the 1980s to 2000s

At the beginning of the 1980s, measuring finical results solely in performance management was nearly obsolescence, as the business became more and more difficult since the competition grew in the world (Kamal, 2015). Thus, Johnson and Kaplan called for an evolution of performance management to fill the gaps both in academy and practice, to respond the impact of changes of external economic environments and internal organisational structure (Kaplan and Johnson, 1987). Subsequently, they published their well-know performance measurement and management framework design in Harvard Business Review, namely the BSC model (Kaplan and Norton, 1992). In addition to that, more performance management models/frameworks were developed, such as the Performance Measurement Matrix (PMM) (Keegan, Eiler and Jones, 1989), the Performance Pyramid (R. Lynch and Cross, 1991), etc. More non-financial indicators were put into use in performance management afterwards, which reflected the effectiveness of operation, the overall situation and future trend of organisation.

At the same period, due to the rapid development of science and technology, especially the development of information technology), the acceleration of globalisation, the diversification of customer needs, higher demands were being placed on performance management by the managers to cope with the ever-changing environment. Moreover, people began to rethink strategic theory and strategy-performance relationship in organisational management. Porter (1985) argued that the superior performance of the processes and activities performed by organisations is the foundation of competitive advantage under strategic management. Therefore, the revival of strategy management made performance management put an increasing emphasis on strategy formulation and strategy implementation. Some people even argued that this evolution was a crucial turning point of performance management development (Cuccurullo, Aria and Sarto, 2016). The most typical sample of linking organisational strategies and objectives with performance is Kaplan and Norton's BSC model and Strategy Map that published in the 1990s. They translated organisational goals and strategies from four perspectives and, proposed a set of strategy centred performance management processes, i.e. strategy decomposition, sub-objectives setting, strategic process planning, resource allocation, budgeting and employee training and development. Later, they called their performance management approaches as strategic performance management (Kaplan and Norton, 1996). From then on, more approaches or management elements that embody the operational and strategic features of an organisation were incorporated into the performance management practice due to connecting the management to the organisational objectives and strategies.

Eventually, there developed more comprehensive, integrated and continuous performance management processes, which were often oriented to and by results, in line with objectives, strategies, organisational/management structures and people (Kaplan and Norton, 1996). The performance management process includes a full series of activities for enhancing performance and achieving pre-set objectives. Typically, it often contains cascading objectives, local aims setting, monitoring and reviewing, and feedback (Smither and London, 2009), which becomes very popular and standard processes in performance management practices over the past 20 years (Aguinis, 2013). However, in these performance management systems, employee performance is often measured on their activities and corresponding results (Pulakos, 2009). In other words, the contents of performance become more extensive than before, especially in terms of the results, yet the causal factors are still restricted to operational aspect often. Even if non-operational factors are involved in performance management practice, such as

environment, culture, personality, management style, people do not regard them as a mainstream direction to set a very specific method to manage.

However, the EFQM business excellence model has done its different job in providing comprehensive performance management solutions. It proposes a set of five dimensions enablers, namely leadership, people, strategy, partnership and resources, processes, products and services, that are believed to the drivers and important management areas for achieving the organisation's overall goals (EFQM, 2013). Nonetheless, although the EFQM business excellence model has strategic nature, it is often questioned that this model is not closely related to the specific strategies of an organisation, which could negatively affect the effectiveness of its application (Zheng, 2017).

2.1.3 Performance management in the 21st century

At the beginning of the 21st century, more extensive studies of performance management were developed. Increasing management elements, such as communication and stakeholder, etc., were put into the research and practice. This evolution is believed as the keystones of contemporary performance management (Armstrong and Baron, 2005; Moullin, 2009).

At the same time, with the development of next-generation technologies such as big data, the Internet of Things, mobile Internet technology, industrial robots, and artificial intelligence, etc., the organisational structure, nature of work, communication methods, and management models in traditional organisations have undergone significant changes. People find that although the traditional performance management is making progress both in research and practice area, yet it often cannot adequately meet the needs of the new situation, especially in terms of inflexibility, costly and heavy, inefficiency formal reviewing and rating sessions in performance management practice (Culbert, 2010; Culbertson, Henning and Payne, 2013). Thomas (2006) questioned what makes performance management so tricky in practice comparing with its overwhelmingly attractive in theory. In 2012, a Return on Investment (ROI) analyses conducted by Gartner Inc. showed negative results toward traditional performance management. Specifically, the investigated companies often invested millions of dollars and excessive time to establish and implement their performance management systems. However, the return was actually less than expected, and the invested performance management systems were believed has almost no impact on the individual or organisational performance (CEB,

2012). The industries and scholars have raised a call to improve the traditional performance management (Adler *et al.*, 2016).

Alongside the people who want to make a change to the traditional performance management approaches, there has been generated considerable debate on what kind of change could have better value on performance management (Chaurasia, Garg and Agarwal, 2016; Albrecht *et al.*, 2015). There are mainly two types of views on this issue. One is to streamline the current cumbersome formal performance systems. The method, in general, is to reduce unnecessary contents, low-value steps and processes from existing performance management system. People call it in short as streamlining the performance management process. For instance, a significant number of firms have partly shifted their management focus from the formal processes of performance management to informal, unscheduled managerial actions. In these firms, the informal actions or process, such as daily communication, firm atmosphere, etc., have indicated the importance of enhancing organisational performance. The new performance management system in these firms have reduced the increase of more formal performance management activities and processes (Bryant, 2011). Another is to improve performance management by shifting the focuses form optimising the operational process to the daily employee behaviours management for enhancing the overall performance, as some people argue a formal performance management system could still be too heavy, burdensome, and costly for new types of organisations (Effron and Ort, 2010). This trend leads to more performance management practice to shift their focus from managing the operational process to managing and developing people. For instance, some companies have established a real-time feedback system to help their employees work better and respond to challenges. This type of companies often has agile organisational goals or dynamic short-term objectives. The real-time feedback system can effectively support the timely objective and operation process adjustment as the situation changes. Some organisations choose one of these two improvement strategies, and others make changes combining the above two methods (Pulakos, Mueller-Hanson and Arad, 2019).

In this stage, the contents of performance in management have become much more diversified than it has been. Besides the action and process in operation, more elements that are considered to be important to achieve the organisation's defined objectives are involved for management.

In sum, over almost a century, performance management practice is commonplace in all sectors, including businesses, public departments, Non-Governmental Organisations (NGOs), Non-profit Organisations (NPOs), etc. It seems clear that the performance management field has

continuously made change and improvement in response to global economic development trends. More recently, Along with the advances of economy, society and technology, more management contents and important factors, such as social responsibility, work-home balance, environmental considerations, the sustainability of development, etc., are becoming new performance management areas that nowadays organisational will have to take into consideration. Especially, fuelled by rapidly developing information technologies and artificial intelligence technologies, increasing globalisation, it also sees the performance management practice has been evolved and now involves more sophisticated methods and contents (Schick, 2001). More contents relating to enhancing performance both in the individual and organisational level, in particular non-behavioural factors, such as organisational culture, interactive relationships, teamwork, social interaction, shared value, personal skills, have been embodied in performance management practice. Therefore, with the continuous progress of human society that the organisations are witnessing, the performance concept and its contents are undergoing changes as well (Llgen and Pulakos, 2000). Meanwhile, organisations are moving to a more personal, adaptive and meaningful version of performance management in recent years.

2.2 The contents of performance in management

What constitutes performance has been a conundrum for many years, along with the evolution of performance management. People's understanding of performance's contents is continually changing, and different areas have different opinions on it. Notably, there is little consensus about what are the contents of performance, because measuring performance is complex, technical and takes many forms (Shane, 2010). For example, Campbell (2008) described that there is scarcely any literature on performance structure and performance contents. He found that the researchers and practitioners spent relatively little effort into studying and clarifying what exactly the concept of performance it is.

However, People often more or less need to get this issue clear when they are studying or applying performance management. From the literature, most scholars agree that, as a management concept, performance often contains two aspects of contents, one is the action (i.e., behavioural) aspect and another is the result aspect (Campbell, 2008; Campbell *et al.*,

1993; Kanfer, 1990; Roe, 1999). This view of performance is believed to represent the traditional understanding of performance concept.

The action aspect mostly refers to the intended human activities the individual carries out for achieving personal aims or organisational goals. It encompasses action, behaviours or processes, such as assembly, production, quality check, promoting cosmetics to customers, giving a lecture to students, or rescuing a critically ill patient, etc. However, not every piece of the action would be seen as the contents of selected performance, but only the action which is at least relevant for the organisational objectives (Zheng, 2017). Meanwhile, this issue often relates to the organisation's management resolution. Just as Campbell et al. (1993) argued that performance is the actions driven by the organisation objectives and personal interests, and how well these actions do compare to the initial intentions. Thus, although action aspect is one of the contents of performance, what kind of action can be included in a specific performance actually depends on the relationship between itself and the objectives (Sonnentag and Frese, 2002), often by judgemental and evaluative processes (Motowidlo and Schmit, 1999). The results' aspect mostly refers to the consequence or outcomes of the individual's activities, yet it also appears at the team or organisation level, such as efficiency, economy and fairness, snd so on (Boyne, 2002). Neely, Gregory and Platts (1995) argued that the two fundamental dimensions of performance are efficiency and effectiveness of the actions that can decide the level of performance the organisation attains. Liu *et al.* (2010) proposed a 3Es model that includes efficacy, efficiency, and effectiveness, for examining the contents of organisational performance. The above described actions may result in outcomes such as the quantity and quality of the assembled machine, sales figure and customers' satisfaction, students' achievements, or patients' survival rate. Similarly, whether the results of certain actions can be the contents of a specific performance depends on their relationship with the objectives, often the relationship is planned or selected by stakeholders (Kenny and Bourne, 2015).

Besides the dichotomous division of action-results on the contents of performance, another popular view is that performance has multi-dimensional contents (Sonnentag and Frese, 2002). Berman *et al.* (2010) pointed out that the performance is a multidimensional concept, in which the important dimensions could be productivity, abilities, actions, process and utilised resources. Rich, Lepine and Crawford (2010) proposed that the dimensions of performance could involve not only action and results but also resources, finance, political and social elements, etc. In 1993, Viswesvaran and Campbell proposed their multidimensional performance model, respectively (Viswesvaran, 1993; Campbell *et al.*, 1993). Viswesvaran's

model has ten dimensions, while the other one has eight dimensions which can be seen in Table 2-1.

Table 2-1 Two types of performance dimensions

Ten dimensions of performance ***Viswesvaran, 1993***	**Eight dimensions of performance** ***Campbell et al., 1993***
• Overall performance/outcomes • Productivity • Communication • Effort • Knowledge • Interpersonal skills • Quality • Leadership • Rule following • Administrative skills	• Task-specific behaviours • non-task specific behaviours • The adeptness of written and oral communication tasks • Individual's effort • Personal discipline • The degree to which a person helps out the groups and his or her colleagues • Supervisory or leadership - in the case of a supervisory or leadership position - and partly • Management and administration

Borman and Brush (1993) further explained that each dimension could comprise certain sub contents which are depending on the difference of management realities and business context. For example, in the management/administration dimension, the sub contents could often involve planning, organising, instructing, monitoring, motivating, training, coaching, communicating, feedback, etc. The dimensions of performance that Campbell proposed are mostly action-based, while the Viswesvaran's has broad contents that could cover with those dimensions highlighted in the performance model of Campbell and his collages.

Borman and Motowidlo (1993) divided the performance into two categories. One is task performance, and another is contextual performance. Task performance refers to the actions of an assigned job. These actions often play a part in the organisation's technical core or key operational processes. The outcomes of these actions must have a direct (e.g. operational activities in the front line) or indirect (e.g. management activities of middle or senior managers) contribution to the pre-set organisational and individual objectives. Correspondingly, most contents of Campbell's performance model belong to task performance. Contextual performance refers to other activities that often are not clearly required by the operation rules

in an organisation. Hence, these activities often generate results that differ from those of the technical core or key operational process. The results of these actions often support the organisational, social, and psychological environment coinciding with the organisation's preference. Contextual performance is believed relating to personality and motivation, whereas task performance relating to capability (Motowidlo and Schmit, 1999). Specifically, People believe that contextual performance must have very rich contents rather than some uniform actions or behaviours, and is another multidimensional concept (LePine and Van Dyne, 1998). In this area, scholars have done a lot of research to enrich the contextual performance concept. The studies show the contents of contextual performance involve organisational citizenship behaviour, such as altruism, conscientiousness, civic virtue, courtesy, and sportsmanship (Organ, 1988); organisational spontaneity, such as creating success for peers, subordinates and superiors, organisational honour (George and Brief, 1992); prosocial organisational behaviour (Brief and Motowidlo, 1986), personal initiative (Frese *et al.*, 1997), voice (LePine and Van Dyne, 1998), taking charge (Morrison and Phelps, 1999).

In recent years, new performance dimensions are introduced by scholars, along with the changing of the nature of work continues. For instance, because of the dynamic nature of new work, research has indicated that adaptive performance could be one critical type of dimensions in individual and organisational performance (Pulakos *et al.*, 2000). Moreover, as the individual creativity and innovation become more and more critical for achieving the success in contemporary organisations (Eisenhardt and Tabrizi, 1995; Gong, Zhou and Chang, 2013), scholars argue that nowadays creativity and innovation are extremely important dimensions of the modern employee and firm performance (Tierney and Farmer, 2002; Anderson, Potočnik and Zhou, 2014). In much the same way, in the knowledge-intensive and innovative organisations, knowledge learning and transformation has been identified as a core dimension of performance (Harari *et al.*, 2014). Munir and Saif (2015) argued that the contents of success and desired performance of an organisation should include social responsibility, customer relationship, profitability, reputation, etc.

Shields *et al.* (2016) proposed a more in-depth understanding of performance in their research. They believe that the contents of performance are subjective, constructed (and hence frequently contested) phenomenon, depending on each individual cognition and expectations on management. For example, to a business, the performance should be clarified depending on the stakeholders' consideration, especially the dominant stakeholders. To a production manager, he might nominate annual net profit and labour productivity. To a production line staff, the

performance might equate with the job and income security and workplace health and safety. In this sense, the contents of performance are complicated, even open-ended.

2.3 Performance definitions

Until recently, the term "performance" in management study is still very hard to clearly define. There are various interpretations of "performance" in everyday life. According to dictionary.com, the word "performance" is first recorded in 1485–1495, and its first known use was in the 15th century. The contemporary explanation of the term "performance" in the Cambridge Dictionary (Online, https://dictionary.cambridge.org/) is:

1. How well a person, machine, etc. does a piece of work or an activity.
2. How successful an investment, company, etc. is and how much profit it makes.

The lexical definition indicates that the core contents of "performance" in daily life are mostly about "doing", i.e. the act of doing something, such as a job, and "result", i.e. how well an activity or job is done.

In performance management study, although the concept of performance is frequently used in almost all domains, it is hard to clearly define the term "performance" (Otley, 1999). Scholars rarely give an explicit definition of performance (Lebas and Euske, 2002). For example, March and Sutton studied 439 articles in three well-known journals, i.e., the Strategic Management Journal, the Academy of Management Journal, and Administrative Science Quarterly, over three years. They found that compared to the consensus of the importance of performance in management fields, very few attention and very little work has been put on clarifying what the performance in management is and finely conceptualising it further (March and Sutton, 1997). Some scholars even believe performance is not a unitary concept within a definite meaning, as there exist various understandings of performance (Lebas, 1995; Otley, 1999). For instance, Lebas (1995) argued that performance is something that stakeholders select and define. Bouckaert and Halligan further back up Lebas' idea that performance could just be a set of information, which mostly reflects the achievements and corresponding significance in terms of different stakeholders' interests (Bouckaert and Halligan, 2008).

On the other hand, there are different definitions of performance according to the range of disciplines and research perspectives, which leads to no consistent definitions of performance

in the management research (Meyer and Gupta, 1994; Krause and Mertins, 1999; Lebas and Euske, 2002). Some of them argue that performance has a polysemous nature (Elena-Iuliana *et al.*, 2016) and others suppose that the concept of performance is constructed of dimensionality (Moon and Fitzgerald, 1996; Richard *et al.*, 2009). O'Donnell and Duffy (2002) concluded that the definitions of the term of performance in management literature are lacking and inconsistency and a large number of researches have been published that directly address the area of performance and performance management but often do not explicitly give the definition of the performance itself.

This study proposes that there are mainly two types of performance definitions in the literature. One is the general definition with a high-level summary, and another is the specified definition with more detailed descriptions (Qi, 2010; Zheng, 2017). Thus, the existing performance definitions are reviewed by these two categories, general performance definitions and specific performance definitions.

2.3.1 Category one: general definitions of performance

In this category, the performance definitions are often simple and easy to understand for general usage. Most of the traditional performance definitions can be categorised into this type. Often, performance is defined as action, results or both simultaneously (Lebas and Euske, 2002; Neely, 2002).

1) Action-based definition of performance

Many other researchers believe performance is behaviour only, which should exclude outcomes. For example, Murphy and Kroeker (1988) put forward the definition of performance from the action perspective. They define performance as a set of behaviours which are related to the organisational targets or internal unit. Campbell, McHenry and Wise (1990) stated that performance is constituted of purposeful behaviours, yet the outcome should distinguish as the results of performance. Dubnick (2005) argued that performance is either a small action or a complex activity which is driven and led by some intentions, that is different from mere behaviour. Meantime, he admits this definition might course problems by the looseness of board interpretation. Ermolayev and Matzke (2007) defined performance as intended action, which could be either driven by a person's subjective will or urged to carry out the assigned job by an organisation. Burns and Baldvinsdottir (2005) not only defined performance as accomplishing tasks but also argued that a circumstance which can achieve the best result

should be associated. In his definition of performance, the importance of environmental impact is highlighted. Neely (1996) proposed that the efficiency and effectiveness of action are two basic dimensions of performance and, could be utilised to define the performance. Lebas and Euske (2002) argued that performance is all the present activities and processes which can lead an organisation to future success. This definition reflects the link between present and future, emphasising the impact of the action. Entchelmeier (2008) put forward that defining the performance should taking a system perspective, and indicates the performance includes involves four dimensions, i.e. input, process, output and impact.

2) Outcome-based definitions of performance

A relatively large number of researchers believe that performance is the outcome of a specified task (Kenny and Bourne, 2015). For instance, de Waal (2003) defined the performance as outcomes achieved by activities of organisation and individual. Faulk (2002) argues that performance is an accomplishment of predetermined organisational purpose. Dwight (1999) gave his definition of performance that it refers to what extent the organisational objective is achieved. Krause and Mertins (1999) proposed a definition of performance from the stakeholder perspective, i.e. performance is the objective achievement relating to its relevant stakeholders. Kane and Kane (1992) defined performance as the record of the outcomes that are made when doing a portion of a job within the required time. According to this definition, the record of all the job activities can be seen as a distribution of performance, containing more useful information. Hall (2003) considered performance as an aggregation of working capability and production capability, which the outcome is specified.

3) Output and action combined definition of performance

With the development of the performance study, some scholars find that action-orientation definition cannot approve that, positive activities must be able to achieve well. At the same time, they propose that result-oriented performance management may focus too much on short-term goals. To deal with these issues, Brumback (1988) concluded that both output and action should be considered as two components of performance. The action itself also can be treat as a kind of output, while it produces the output. Mwita (2000) proposed that a congregation constituted of action, output and impact three variables, can generate performance. In the studies of Liu *et al.* (2010) and Qi (2010), results assessing against the organisational objectives, intended actions and impacts formed the concept of organisational performance.

In addition, there are many other definitions from a performance measurement perspective. For instance, Rolstadås (1998, p990) argued that performance has seven types of criteria, namely effectiveness, efficiency, quality, productivity, quality of work and life, innovation and profitability/budget ability, and these criteria are complexly interrelated. Lebas (1995, p26) proposed that performance is "the future value of the criteria retained". He believes that performance can be defined by the future or over past achievements. He argued that the future is much more important than past achievements because management aims to create the future for both the organisation and society. That is, the evaluated capability can present the performance for achieving future success. Melville and Kraemer (2004) believed that performance is a ranger of measures of all the activities either in organisation or operation level in a firm, including productivity, efficiency, profitability, market value, competitive advantage, etc. All these measurement indicators can be seen as special forms of expression of actions and outcomes in performance.

As can be seen above, the general performance definitions are mostly defined by action, outcome, impact or their measurement indicators, separately or combined. Generally, performance is often defined by directly related action and its outcomes (Armstrong and Baron, 2005) in this category.

When researchers and practitioners consider the process of performance generation in practice, the issue of these definitions is that the action is involved only instead of more other elements that can achieve the results. For instance, although there must be various stakeholders contributing to the performance, such as employees who carried out the action or a manager who may be involved in instituting the objective, are omitted in the definition. This study believes that these type of general performance definitions is action-oriented, as they often ground on the widely accepted assumption that action leads to performance (Neely, Gregory and Platts, 1995).

Moreover, other scholars have done a lot of work on performance conceptualisation in different ways. For example, Bouckaert and Halligan (2008) proposed a performance analytical model in the public sector. Seven parts of contents constitute the model, which includes input, activity, output, effect/outcome, trust, objectives, needs and environment. The model links the five contents of inputs, activities, outputs, effects/outcomes and trust, and forms seven logical linkages between these five contents. Choosing different combinations of contents makes performance have different features. For example, if the input is selected only, performance will highlight its economy, if selecting input and output, performance will emphasise on

efficiency and productivity, if selecting output and effect/outcome, performance will show its characteristic of effectiveness. The authors also argued that the larger the span of contents in the performance model, the less it is possible to attribute causally in a one-to-one relationship to the previous one. The further the scope of this sequence of performance contents when defining a particular performance, the more problematic the links could be.

Bouckaert and Halligan's model shows a different construction of performance contents from the action-results one. It also indicates that there may be logical connections between the various parts of contents in performance, such as causality.

According to Bouckaert and Halligan's idea, this study proposes that the contents of performance might be understood through two main categories, i.e. selected results in line with the desired objectives and the causal factors that can or has contributed to the achievement of the results. However, they have too many varieties to be exhausted one by one in practice and studies.

2.3.2 Category two: specific definitions of performance

Besides the general definitions, in business practices, performance is often prefixed with different aspects of the business, such as financial (Gudiel Pineda *et al.*, 2018), marketing (Wang and Kim, 2017), operation (Kauppi *et al.*, 2016), in the past literature and the daily practice. Although these terms are rarely well defined, this type of definitions often provides more information about the performance, e.g. people who implement a specified aspect of a job or achieve a determinate objective are indicated.

1) Job Performance

Rotundo and Sackett (2002) conceptualised job performance as behaviours which under personal control, in order to reach the organisational targets. Rich, Lepine and Crawford (2010) argued that job performance is an overall value, which has direct and indirect impacts on the organisation from staff's intended action. In 1993, Borman and Motowidlo further classified job performance by dividing it into task performance and relationship, based on the Campbell performance structure model. Task performance refers to the effectiveness of the staffs, which may be participation in core work, or just providing raw materials or services (Borman and Motowidlo, 1993). Contextual performance is the results and impacts of behaviours that can

support the salutary contraction of the organisation. These acts are not just for a particular project, but in the daily working activities.

2) Operational Performance

Patel, Messersmith and Lepak (2013) proposed that the capability of effectively managing organisational critical internal processes is operational performance. Voss, Åhlström and Blackmon (1997) argued that operational performance is the results of the measurable organisational process. Melville and Kraemer (2004) defined the business process performance as operational efficiency of specific business processes, measures of which include customer service, flexibility, information sharing, and inventory management.

3) Group Performance

Jehn and Mannix (2001) stated that group performance is a judged crew's productivity based on the pre-established standards by the manager. Wieber, Thürmer and Gollwitzer (2012) described that group performance is the results and operations carried out by a team for the unified objectives.

4) Financial Performance

Jackson and Hua (2009) defined financial performance as the results of the process, likes profitability, cash flow, etc. Brah and Chong (2004) argued that financial performance is a part of the business, likes sales and economic benefits.

5) Marketing Performance

Anand, Fosso Wamba and Sharma (2013) stated that marketing performance is organisational target related to customers. Wu *et al.* (2006) proposed that some marketing indicates to define marketing performance, including sales growth, market share, product development, and market development.

6) Supply Chain Performance

Hausman (2005) defined supply chain performance as all the actions related to supply chain management for achieving customer satisfaction. Chang (2007) argued that supply performance contains some of the organisational characteristics in supplying processes and personal activities.

7) Employee Performance

Liao (2004) proposed that employee performance refers to the activities carried out by employee for achieving the objective, specifically, refers to employees' behaviours of serving and helping customers.

8) Manager Performance

Lusch and Jaworski (1991) and Mom *et al.* (2015) stated that manager performance is how well the manager implements or achieve working goals (Lusch and Jaworski, 1991).

9) Salesman Performance

Pappas and Flaherty (2008) argued that salesman performance is to what extend the salesperson is meeting sales targets. Homburg, Müller and Klarmann (2011) proposed that sales performance is an economic indicate relate to salesman's sales job. Within these definitions, actors as key stakeholders are distinctively identified.

2.4 Summary

In sum, from the review of performance literature in the management context, this research finds that a result of excellent performance is always an organisation, a team, an individual expects to achieve (Amaratunga and Baldry, 2002). In a general sense, the performance itself means the progress of the whole process from intention, plan, (iterative) action/process to desired outcomes which are being concerned by specific stakeholders (Sonnentag and Frese, 2002). Therefore, organisations often use performance as representative of the progress of achieving their objectives and strategies. By managing and measuring performance at different levels, e.g. individual level, team/department level and organisation level, organisations can achieve their goals and further to evaluate their achievements (Armstrong, 2006).

However, the term "performance" in the management study is still hard to be defined appropriately (Cardy and Leonard, 2011). The concept of performance in management practice embodies various contents which are far beyond only action and results. Therefore, scholars and practitioners have different understandings of what performance is from different perspectives. However, the traditional performance definitions are mostly described as actions, results, or their combination, which cannot fully cover the practical meaning of performance

in reality (Qi, 2010; Zheng, 2017). The imperfection of defining performance could be a gap in the current performance management study.

The scholars and practitioners have produced a large variety of definitions for the concept of performance, in which an inductive approach has been used to develop most of the traditional definitions based on previous experience, but not from first principles (Otley, 1999). Thus, results, action, impact, stakeholder and other elements could not fully cover the entire contents of performance in a real application, particularly for the knowledge-intensive firms. Moreover, each constitution of performance in the existing definitions is hardly proved to be accurate or applicable and often considered as an assumption (March and Sutton, 1997; Richard *et al.*, 2009). These issues could be part of the reasons that the traditional performance definitions are often cannot cope with performance management practice in emerging industries.

How can people summarize the all-encompassing contents of performance and his managerial characteristics to give a satisfying definition seems to be a difficult problem to solve. Actually, back in 1995, Lebas has proposed that performance is not only what an individual or an organisation achieve, but also how the achievement is accomplished (Lebas, 1995). Lebas's proposal of performance is exactly a coincidence with the findings of this study from the reviewing on the contents of performance. All the contents of performance could be summed up as the results and their causal factors. Lebas also argued that causal models of performance could be varied. The core of the performance is about developing and managing the components of the causal model, under the specific situation of an organisation (Lebas, 1995). This study argues that clarifying of the causal model of specific performance could help the organisation attain the stated objectives timely. To some extent, the concept of performance provides a platform for organisation management, which can guide an organisation to achieve expected goals according to the possible existing causal model in corresponding conditions.

Nevertheless, the causal character of the performance concept has not interested the researchers and industries. In fact, although the causality in performance or performance management has not been intensely studied, the idea of causal and effect has occasionally been interested when it comes to the issue of effectiveness both in performance management research and practice (Barrow, 1976; Keats and Hitt, 1988; King and Zeithaml, 2001; Bennedsen, Kongsted and Nielsen, 2008). For example, in the United States from about mid-1940s to roughly early-1980's, the organisational effectiveness movement devotes itself to on seeking to establish links, patterns, and configurations between various factors or element of performance. After the

1990s, the effort on what are the main factors of performance and how they relate to one another still makes flicker in the performance management field (Talbot, 2010).

Based on the above work, this study understands that there exists a research gap relating to the performance definitions and performance management frameworks in the performance management field. Furthermore, this research proposes that the implication of performance could be summarised by causes and their effects. Although some studies have mentioned this idea occasionally, yet it has not been explicitly and deeply discussed and studied. Therefore, we systematically study the causal implications of performance in Chapter 4 for improving the conceptualisation of the performance.

Chapter 3 Literature Review of Performance Management and Frameworks

This chapter presents a critical review of literature on performance management, especially on the concept of performance management and taking into consideration the popular and representative approaches and frameworks in this area. This review systematically investigates the multidisciplinary features of performance management and seeks to explore its successes and weaknesses in terms of the current context. After that, a traditional performance management mechanism and approach, i.e. coordination, is reviewed. In the end, a summary is provided to indicate the issue of the existing performance management frameworks.

3.1 Definition of performance management

Arguably, the term "performance management" is firstly introduced in Warren's earlier study on investigating the features of the performance management system in 1972. Another early literature of performance management is written by Beer and Ruh in 1976, which described the pioneering performance management system of Corning Inc. (Armstrong and Taylor, 2014). In the next decade after the 1970s, the meaning of performance management was undefined at most time, as this managerial concept does not attract enough attention of scholars and industries in the period. Until the early 1990s, more and more scholars, especially those in human resource management field began to concern about how to manage employee's performance for organisations, which promotes a rapid improvement of performance management both in research area and industries practices (Armstrong, 2010). However, despite the flourishing development of the performance management field, there is no all-accepted definition for the concept of performance management (Thorpe and Beasley, 2004).

Some scholars have given very broad definitions of performance management. They often believe that performance management could be a subset of almost all human and organisation activities (Brudan, 2010). Edis (1995) argued that performance management refers to a type of integrated, systematic management approach whose aim is to realise stated organisational objectives, mission and values. Slater *et al.* (1998) propose that performance management can

be considered as a value-adding process of organisational performance (Mwita,2000). In a project report of the Institute of Personnel Management (IPM, later became the Chartered Institute of Personnel and Development, i.e. CIPD, on 1 July 2000), Thompson and Bevan proposed performance management as a type of strategy that links to every management system, such as human resource management system, information and communication system, organisational culture establishment system, etc., in an organisation (Thompson and Bevan, 1992). Mohrman, Cohen and Mohrman Jr (1995) gave a broad definition, that performance management is managing the business. Rayner and Geishecker (2001) proposed that performance management refers to a type of management methodologies, involves indicators, processes and systems that are used to control and manage business performance. Sharma (2009) argued that performance management is a series of activities of evaluating progress for attaining the pre-set organisational objectives. Laitinen and Kadak (2019) proposed that performance management is a series of process for quantifying and improving the efficiency and effectiveness of individual and organisational performance.

This type of definitions only indicates that performance management is an integration of management approaches. They are mostly abstractive, neither specifies the distinguishing features or properties nor provide some detailed information about performance management. Hence, such type of definitions lacks practical guidance and is difficult to help the organisation's specific performance management implementation (Qi, 2010).

On the other hand, other definitions provide more detailed contents and properties of performance management, which could help this study gradually understand what it is? However, they are often defined by different criteria or contents (Mwita, 2000) as the multidisciplinary character performance management has (Ittner and Larcker, 2003; Brudan, 2010). These definitions generally fall into three categorical types: human resources perspective, strategy perspective and integrative perspective.

3.1.1 Performance management definitions from a human resources perspective

Researches on explicating the interaction and relationship between human resource management and performance were initially carried out in the 1980s (Devanna *et al.*, 1982; Beer *et al.*, 1984; Guest, 1987). Scholars became active in this field since the mid-1990s, inspired by Huselid (1995), who published a ground-breaking study about a correlation between the degree of sophistication of human resource systems and the market value per

employee based on a range of publicly quoted companies in the USA. Since then, the vital functions of human resource practices on performance both in individual and organisational gained a particular emphasis (Huselid, 1995; Paauwe, 2009).

The existing definitions of performance management from the perspective of human resource management believe that performance management aims to utilise the effect of human resource management for achieving and enhancing organisational performance, and the approaches used are removing intermediate blocks, prompting and rejuvenating the human resource (Kandula, 2006). Enhancing organisational competitiveness by continuously developing and effectively managing employees which is the core issue performance management (Mujeeb, Muhammad and Muhammad, 2011).

Daniels (1989) defined performance management as a systematic, data-oriented approach that can optimise the performance of private sector organisations by strengthening the management of employees (Mwita,2000).

Rogers (1990) suggested that performance management is a sequence of planning and review processes.

Bevan and Thompson (1991) proposed that performance management contains two parts of managerial contents, which can be grouped into reward-oriented and development-oriented.

Lockett (1992) argued that performance management is to develop employees' competence and commitment. Walters (1995) gave a similar opinion that performance management has an essential goal of developing and enhancing the effectiveness and efficiency of employees.

Aguinis (2009) defined performance management with a simple construction. Performance management is a continuous process of recognising, assessing, and improving individual performance. Kinicki *et al.* (2013) proposed a similar definition of performance management. They argue performance management is mainly managing the employees' behaviours, by defining, assessing, motivating, and developing them, for achieving high-level employees' performance.

Denisi and Murphy (2017) argued that performance management refers to a range of activities, policies, processes and interventions used by an organisation, which aims to improve staffs' performance.

Schrage *et al.* (2019) proposed performance management that includes performance appraisal, typically involves defining performance objectives at the beginning of the year and assessing

outcomes after a working period, e.g. at the end of the year, and professional development that emphasis on performance improvement, coaching and feedback.

In this category, performance management is often regarded as a subset of human resource management and, commonly defines as a serious of managerial processes and activities aimed at defining, monitoring, assisting, measuring, motivating, and improving the expected performance of employees for enhancing the employee and organisational performance (Aguinis, 2013; Cardy and Leonard, 2011; Cascio, 2015; Kinicki *et al.*, 2013; De and Pritchard, 2006; Clear Review, 2018). This type of definitions of performance management often has weak linkage to organisational objectives and strategies and has an unclear boundary from human resource management.

3.1.2 Performance management definitions from a strategy perspective

Performance management definitions in this category have a clear focus on interpreting the specific organisational strategies, furnishing some robust tools to establish an internal link from strategies to various management processes, and decomposing organisational objectives according to logic paths or models (Kloot and Martin, 2000; Marr, 2007; Waal, 2007; Akhtar and Sushil, 2018).

In 1996, the Organisation for Economic Co-operation and Development (OECD) introduced a definition of performance management in the context of new public management reforms, which including a series of processes: setting performance objectives, implementing processes to realize the objectives, evaluating performance and feeding back performance (OECD, 1996). This definition mentions the implementation of organisational objectives, but it does not describe how to implement it.

Simons (2000) regarded performance management as formal, information-based activities. He summarises four key aspects of performance management process: 1) information orientation, 2) formal routines and procedures, 3) design for managers, 4) develop, maintain, change and improve patterns in organisational activities.

Neely, Adams and Kennerle (2002) provided a definition of performance measurement and management from an information-based perspective. They emphasize the importance of gathering, elaborating and analysing information, which can support the decision-making processes in a balanced and dynamic performance management system.

Aguinis (2013) proposed that performance management is a managerial process focusing on defining, assessing, and developing performance in a manner following the strategic objectives of an organisation. The core of the performance management process is to identify, assess, and improve the performance of individuals and teams, adhering to the organisation's objective and strategy.

Moynihan (2008) proposed that performance management is a kind of decision-making aid informative system that includes three components: 1) strategic planning, 2) performance measurement, 3) information use. This system can produce performance information via strategic objectives planning, performance targets setting, performance evaluation, etc. Then, ideally, the performance information would influence a range of possible decisions. Specifically, strategic planning involves establishing a specific direction for the organisation according to the overall objectives and strategies and, setting broad or detailed sub-objectives at various parts in the organisation (Poister, 2003). Performance measurement focuses on establishing the corresponding measurement contents and indicators, then collecting and analysing the performance data, and ascertaining the results (Dooren *et al.*, 2015). Information use is to utilise the gathered information generated through the performance management system to facilitate making management decisions on service, operations and organisational strategies (Moynihan, 2008).

Other scholars consist that performance management is to implement and achieve strategies and objectives. Bititci, Carrie and McDevitt (1997) argued that a performance management system, which could involve various other management systems, is a tool for an organisation to align its performance with its organisational strategies and objectives. Thus, performance management could provide a structured framework for deploying strategies. Otley (1999, 2001) similarly purposed that performance management as an important integrating framework embodies formal processes of implementing organisational strategies and fitting in with its operational environment.

Qi (2010) stated that performance management is a stakeholder-owned system linking all the management activities to organisational strategies, which including six steps: cascading the objectives and strategies, deploying the strategies, measuring the performance, monitoring the performance, assessing the performance and feeding back the performance.

This type of performance management definitions emphasises the importance of organisational strategies and objectives. In this sense, performance management can be seen as a process or

tools for achieving organisational goals by deploying the strategies. The shortcomings of this type of definitions are often putting too much emphasis on actions and processes of implementing organisational strategies.

3.1.3 Performance management definitions from an integrative perspective

Whitaker *et al.* (1982) simply defined performance management as a systematically ongoing process for improving organisational performance. This process includes clarifying the expected objectives and outcomes, establishing performance standards, measuring performance, and then dealing with the performance data to enhance individual and organisational performance.

Abernethy and Chua (1996) emphasised that performance management refers to assembled control approaches, which are developed and utilised by management to enhance employees' performance in line with organisational goals. This idea is supported by Hendry, Bradley and Perkins's (1997) study, in which, the performance management is defined as a systematic approach to enhancing personal and organisational performance for achieving organisational objectives. Bititci, Carrie and McDevitt (1997) once gave a similar and abstract idea of performance management definition, that is, a set of process for integrating performance at all level with organisational strategies.

Armstrong and Baron (1998) also highlighted the complexities of performance management. They refer it as a strategic issue, and at the same time, they advise it needs to be integrated that should involve the issues of alignment of the individual, team and organisational objectives, management crossing departments, coherent of different managerial approaches, balance of achievement and development, etc. They give a more detailed definition of performance management. Performance management is a strategic and integrated approach for delivering sustained success to organisations. The integrated approaches are mainly to improve employees' performance and to develop the capabilities of teams and individual contributors. Armstrong later explains the integration in four senses: 1) vertical integration, which aligning individual and organisational objectives, 2) functional integration, which links different parts of functional strategies, 3) human resource integration, which linking different aspect of human resource management, 4) integration of personal and organisational needs (Armstrong and Baron, 2002). In 2005, Armstrong emphasised that the achievement of shared personal and organisational objectives and the importance of development and support are the nature of

performance management (Armstrong and Baron, 2005). Pulakos (2009) agreed with Armstrong's point of view and supposes identifying ineffective performers should be seen as a key process of performance management.

Ferreira and Otley (2009) defined performance management as a set of formal and informal mechanisms, processes, systems, and networks that are used in organisation management. The functions of performance management are to convey the key objectives and strategies defined by management. The core contents of performance management are to assist the strategic implementation process through analysing, planning, evaluating, controlling, rewarding, etc., further to support and facilitate organisational learning and change.

The integrated definitions reveal more possible contents and characteristics embodied in performance management, such as control mechanisms (Lusch and Jaworski, 1991; Simons, 2000; Otley, 1999), the effects of performance information (Neely, 2002), team capabilities (Benyeogor *et al.*, 2016), etc.

Zhang (2010) studied the performance from the view of complex science management and synergetic. She argued that modern enterprises have the characteristics of a complex system. Thus, organisational performance can be studied by taking the synergetic as the tool. The research showed that the self-organisation mode of enterprise, resources integration mode and unique resources are the key variables which can determine organisational performance. By designing the operating mechanism to guide the enterprise's integration model and self-organisation model, while actively explore unique resources, can improve organisational performance (Zhang, 2010).

From the above literature review, this study finds that performance management is a holistic, complex and multidisciplinary concept. It is strategic and yet needs to be integrated in such a way that it aligns all the operations and other possible success factors (Armstrong and Baron, 2002; Ralph W., 2018). On the other hand, the activities of performance management have three levels, i.e. organisational level, team/departmental level and individual level (den Hartog, Boselie and Paauwe, 2004), whose ultimate goal is to realise the defined objectives and strategies or enhance overall performance.

Furthermore, despite the variety of different perspectives, all three types of definitions mostly share commonalities in terms of the managerial behaviours involved in executing an effective performance management process (Armstrong and Baron, 2005). Like the traditional definitions that people gave to performance, action and process are the central themes of

performance and performance management. However, are there other or more critical contents or factors in performance management that deserves in-depth consideration?

If the functions of performance management definition are to describe what and why about managing performance, then the performance management approaches /frameworks are to elaborate on how to manage performance, which will be discussed below.

3.2 Performance management approaches and frameworks

Many scholars and practitioners are long of the opinion that there should be a unifying framework which could provide an integrated way for flexible performance management (Verweire and Van Den Berghe, 2003; Andersen, Henriksen and Aarseth, 2006). Specifically, most of them believe the core of the unifying framework could provide both means for historical analysis as well as forecasting, based upon the realisation of key factors which embody the organisation's objectives and strategies (Sharif, 2002). However, it is hard to find one or some acknowledged performance management frameworks that are able to accomplish this aim in the literature, mostly due to the breadth and multi-dimensional features of performance management.

From the literature, organisations often use different ways to guide their performance management practice besides the framework. Some use approaches or methods, and others utilise established models (Otley, 1999). However, the board line among approaches, models and frameworks could be a blur, as there is no clear demarcation. Among them, the benefit of a framework is that it could formally connect the desired outcomes with the proposed enablers, that could better help the organisation to account for their performance then enhance it (Shane, 2010).

Moreover, there are two types of performance management frameworks mostly in terms of their initial point of the management process. One often starts with specific strategies or objectives of an organisation (e.g. Yadav, Sushil and Sagar, 2015), while another often proposes a holistic and universal model with a range of approaches which deems to suit all kinds of organisations (e.g. Bou-Llusar *et al.*, 2009). In addition, there are other performance management approaches or frameworks. Some of them emphasise more on the alignment of various business units within an organisation in order to ensure that the units are helping the

organisation achieve a centralized set of objectives (e.g. Franco-Santos and Doherty, 2017). Other of them focus on understanding the complex process of performance management theoretically rather than the applications (e.g. Schleicher *et al.*, 2018). Since there are not many frameworks of these types, they are put into "the others" category. Hence, the existing performance management frameworks are reviewed according to these three categories.

3.2.1 Strategy/objective-based performance management frameworks

The performance management frameworks in this category usually establish certain logic steps or procedures along with some key performance elements for implementing and accomplishing the performance management in line with the defined organisation's objectives or strategies. However, some of them have implicit logics, while others have explicitly fixed logics. The former is often rigid but easy to be applied, and the latter often has a broad scope but challenging in the practical application (Zheng *et al.*, 2019).

Subgroup 1: Implicit logic performance management frameworks

Institute of personnel management (1992) proposed a performance management framework with six aspects:

1) Communicating organisational objectives to its employees,
2) Establishing performance goals of team and employees which are linking with organisational objectives,
3) Formally reviewing progress towards these goals,
4) Identifying the development and awarding by reviewing procedure,
5) Assessing for improving organisational effectiveness,
6) Communicating performance demands through formal performance appraisal (Adrian, 2005).

Local Government Management Board (1993) and Audit Commission (1995) in the UK adopted an extensive performance management model. They all believed that, for the purpose of enhancing organisational performance, the following management processes are vital:

1) Defining individual, departmental and organisational objectives,
2) Organisational planning,
3) Considering organisational objectives and strategies with employees and customs,
4) Ascertaining requests of employees' development,

5) Evaluating the outcomes through personal appraisal,
6) Performance agreements,
7) Modifying performance attitudes of employees,
8) Communicating systems both internal and external,
9) Organisational development
10) Performance review (Mwita, 2000).

Armstrong (2010) claimed that the key factors of performance management process are closely related to interactions between management elements, also including how to manage an individual's performance. He painted a picture of performance management by creating a more integrated approach into it:

1) Performance planning,
2) Defining expectations,
3) Objectives,
4) Measuring performance,
5) The continuing process of performance management,
6) Reviewing performance,
7) Feedback system,
8) Evaluating performance,
9) Rating performance,
10) An alternative visual approach to rating,
11) Coaching,
12) Documentation (Armstrong, 2010).

From the above performance management approaches, a direct link provided by ongoing performance management ensure that employees' activities are following pre-set organisational objectives and strategies, and meanwhile make the employees' contribution increasable and explicit. All the procedures of performance management might be summarized into four key elements: 1) strategic communication and conveying organisational goals, 2) relationship building and establishing a regular review of performance achievements, 3) employee development and providing performance feedback as a basis of a personal development plan, 4) performance appraisal and assessing employees' performance as the basis of performance pay decisions (Shields, 2007). However, most of these approaches or models simply describe various elements of performance management, without providing a suitable theoretical framework, so that organisations could not easily utilise them.

Meanwhile, scholars also develop some specific performance management practice methods. Specifically, Armstrong (2010) stated that performance management should be distinguished from human resource management techniques or approaches. Therefore, he introduces the performance management cycle, which corresponds with Deming's (1986) Plan-Do-Check-Act (PDAC) model as the specific method (Gartner and Naughton, 1988). This approach includes four steps: plan, act, monitor and review.

The first step is performance planning, which is based on a performance agreement. It includes five aspects of processes:

1) Role definition, to identify the knowledge, skills and abilities (KSAs) required and the behavioural competencies needed to achieve the purposeful results,
2) Objectives, to define the purposeful results as an objective and align individual target with the organisation objectives. The 'SMART' is a standard to establish a good objective, which S stands for specific or stretching, M for measurable, A for agreed, R for realistic and T for time-related (Bjerke and Renger, 2017),
3) Competencies, to find out the employees' actual and anticipant capabilities,
4) Performance improvement, to provide support from managers and organisation to help employees enhancing their performance,
5) Personal development, to provide a learning action programme for employees, incorporating such as training, self-managed learning, project work and e-learning, etc.

The second step is performance activities, which include carrying out role, implementing a performance improvement plan, implementing personal development plan.

The third step is managing performance throughout a specified period (often one year), which is believed as one of the most important factors of performance management with its continuity nature. It ensures the realization of performance objectives by monitoring performance, providing continuous feedback, providing coach and deal with under-performers.

The fourth step is the joint analysis of performance, which provide an overall evaluation of performance management practice. It includes dialogue and feedback, performance assessment, agreeing with strength, building on strengths and agreeing on the area for improvement.

These four steps indicate that a performance management cycle is a dynamic approach (see Figure 3-1). All the integrated processes can establish a management environment in which continuous improvement of performance and its outcomes can be maintained (Qing-Ling *et al.*, 2008; Ates *et al.*, 2013).

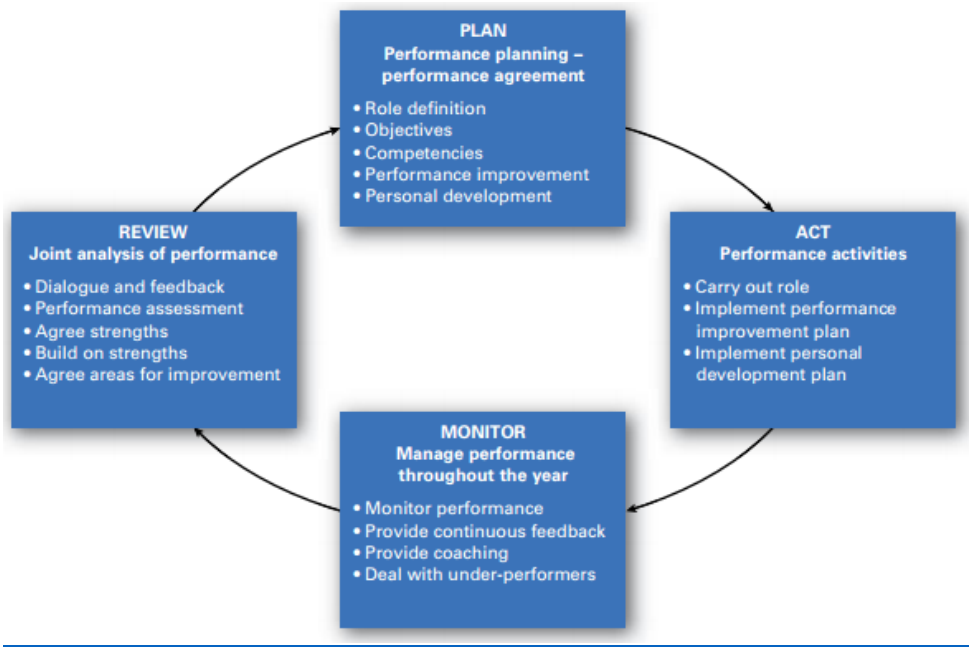


Figure 3-1 Armstrong's four-step performance management cycle (adapted from Armstrong 2010)

Bititci, Carrie and McDevitt (1997) argued that performance management is about how an organisation manage its performance by adopting different management systems. He explicitly pointed out that the goal of performance management is to deploy the organisational objectives and strategies to all the teams' and employees' activities by establishing a loop control system. This closed system mainly includes strategic goals development, critical success factors identification, MBO, performance measurement (non-financial and financial), employee performance review appraisal, incentive scheme and feedback (see Figure 3-2). He emphasises that performance measurement is one of the main parts of performance management processes. The performance measurement system could support the correct deployment of the organisational strategies and objectives and, could provide a structured model to receive relevant information of feedback for further assisting the decision-making and management adjustment (Bititci, Carrie and McDevitt, 1997).

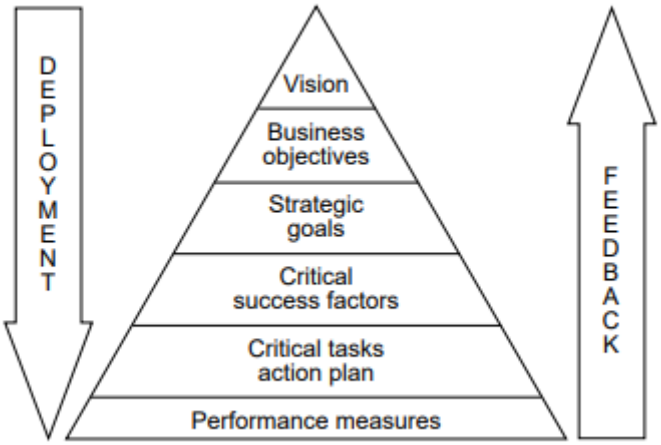


Figure 3-2 The loop control system for the performance management process (adapted from Bititci, Carrie and McDevitt 1997)

This model develops a direct link with organisational strategies and provides a hierarchical level view of organisational vision and objectives. Nonetheless, this model does not give a concrete process to implement organisational strategies.

Mwita (2000) put forward a similar performance management model containing five factors with eighteen elements (see Figure 3-3). Although it seems complex, the emphasis of this model is visibly on establishing and implementing strategies to achieve the organisational mission, values and objectives (Mwita, 2000).

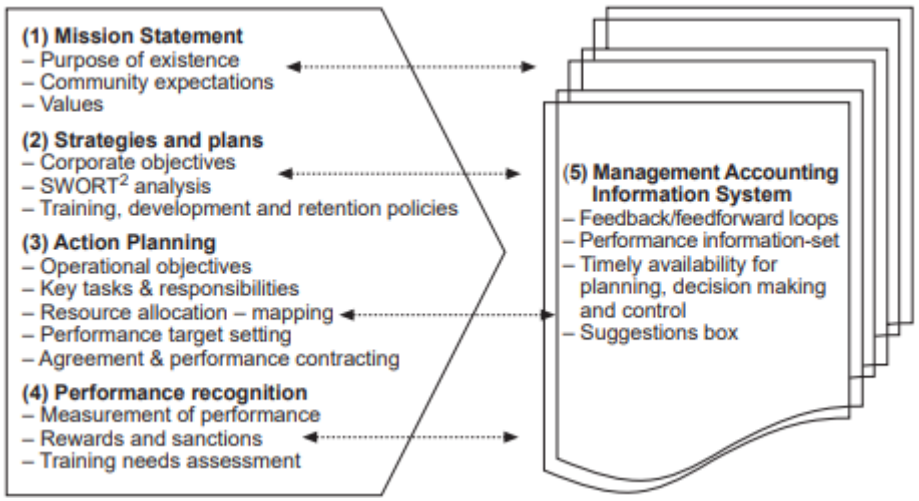


Figure 3-3 The five-factor performance management model (adapted from Mwita, 2000)

Smith and Goddard (2002) constructed a four-dimension framework from an operation research perspective for examining performance management process from four aspects: 1) how is the organisational strategy developed, 2) what is the performance measurement method, 3) how to analyse the organisation's performance s, 4) how to encourage appropriate feedback. This framework also emphasises on the importance of integration and optimisation of managerial processes in a real performance management system. They believe that a successful performance management system will depend on how well these four indispensable aspects integrated and cohered as a whole in an organisation.

Notably, in this category, Otley's (1999) five questions performance management framework and subsequent Ferreira and Otley's (2009) twelve questions performance management framework provided influential improved tools for performance management practice and study. Otley (1999) proposed that organisations need to manage to answer five key questions when they develop a performance management framework. These questions can be envisioned as five key elements of performance management. First, establishing organisational objectives and their assessment. Second, formulating and implementing the strategies. Third, setting performance aims of each level. Fourth, instituting incentive and disincentive mechanisms. Finally, harnessing the information feedback loop to promote organisational learning. This descriptive framework is based on the concept of management control system (MCS) theory (Demartini, 2014). The three prior questions emphasize specifying the objectives and implementing the strategies, and the latter two questions are about human resource management functions.

Otley's performance management framework gives more attention to top-level design and strategies implementation, as Otley underlines the answers to the five questions should be continually developed to cope the new strategies which are adapted as necessary in response to the evolving circumstances of organisations.

Otley's performance management framework is mostly utilised in many pieces of research as a useful analysis tool for the performance management system (Bourne, Melnyk and Bititci, 2018). Ferreira and Otley (2009) later stated that the framework is effective because it emphasises on five key areas of performance management. The questions of these five areas are explicit and meaningful, which can be applied straightforwardly. Moreover, another strength of the framework is that it can be adopted for both private business and public sectors.

Subsequently, some weak areas of the Otley's framework are found. One is the framework loosely links strategic mission and vision through identifying organisation's key objectives and strategies, and highlights the diagnosis and control by the performance management system but overlooks the interactive approach to control, and another is the use of information tends to present a static perspective rather than a dynamic view of change and development (Ferreira and Otley, 2009).

To improve the existing deficiencies of Otley's original performance management framework, Ferreira and Otley (2009) offered a revised and updated version of the performance management framework. It is a more developed and detailed framework consisting of twelve questions which called the "overall framework" is illustrated. Seven new questions are introduced to help to correct the shortcomings of the old framework (see Figure 3-4).

First, more attention is paid to the organisational mission and vision by drawing on Simons' beliefs systems, which aims to influence the employees' behaviour by communicating them throughout the organisation. Second, the key objective question of Otley's framework is adjusted to the key success factors by adopting the terminology of balanced scorecard approach, that enables the performance management to align the objectives with organisation's sustainable development. Third, the interaction between the organisational chart and the performance management system is taken into account. Furthermore, key performance measurement and performance evaluation as two separate questions are emphasized, which outline the quantification nature of performance management. Finally, another three questions, which are performance management systems use, performance management systems change and strength and coherence, make the system to be either diagnostic or interactive and provide the dynamics of improvement of the entire system (Ferreira and Otley, 2009).

Ferreira and Otley's new framework provides instrumental guidance on how to design and evaluate a real performance management system. Nonetheless, the difficulties with the practical application are recognised because of the framework's descriptive characteristic.

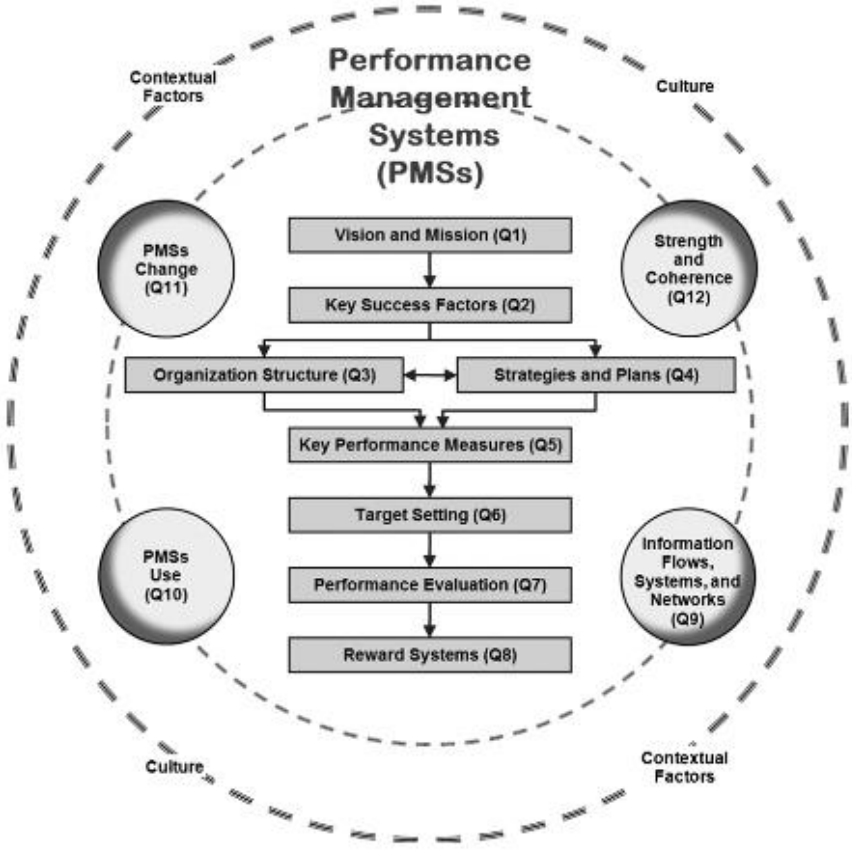


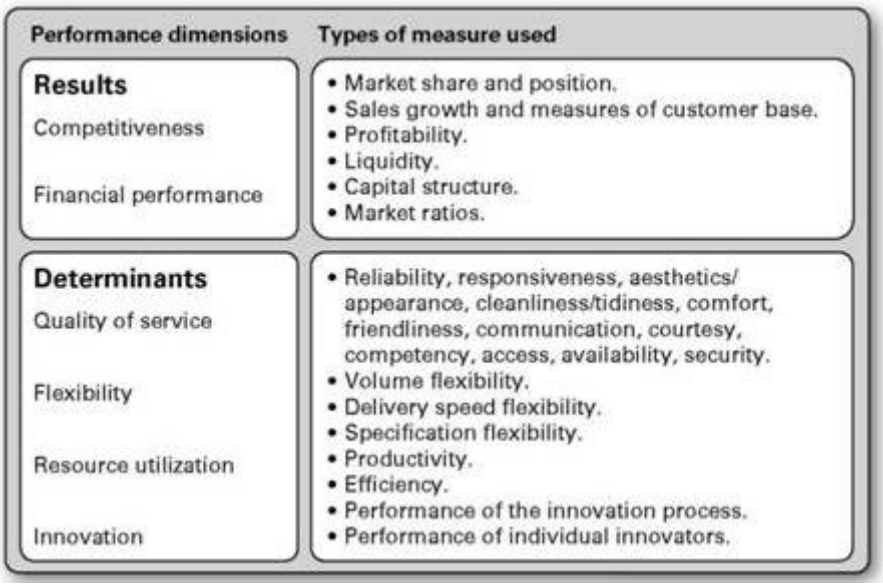
Figure 3-4 Ferreira and Otley's performance management framework (adapted from Ferreira and Otley, 2009)

The performance management frameworks in this category are very specific by listing many actions yet without explicit internal procedures and logics. In addition, most of them do not emphasise the importance of strategies or implementing strategies.

Subgroup 2: Explicit logic performance management frameworks

Fitzgerald *et al.* (1991) developed a results and determinant model for measuring and managing the performance of service businesses in the UK (see Figure 3-5). The key feature of this framework is its structure of six performance dimensions that are classified under two categories: results and determinants. The aspect of results covers financial outcomes and competitiveness. The framework conceptualises the corresponding measures as lagging indicators that can reflect the ultimate goals in an organisation. The aspect of determinants includes four key elements: service quality, flexibility, resource utilisation and innovation. These elements are conceptualised as leading indicators (MFitzgerald *et al.*, 1991). The explicit

logic of this framework is that successfully manage the four key elements can achieve the desired results of two aspects.



Performance dimensions	Types of measure used
Results	• Market share and position. • Sales growth and measures of customer base. • Profitability. • Liquidity. • Capital structure. • Market ratios.
Competitiveness	
Financial performance	
Determinants	• Reliability, responsiveness, aesthetics/ appearance, cleanliness/tidiness, comfort, friendliness, communication, courtesy, competency, access, availability, security. • Volume flexibility. • Delivery speed flexibility. • Specification flexibility. • Productivity. • Efficiency. • Performance of the innovation process. • Performance of individual innovators.
Quality of service	
Flexibility	
Resource utilization	
Innovation	

Figure 3-5 Results and determinants model for performance management (adapted from Fitzgerald *et al.* 1991)

The BSC model, along with its strategy map, is a representative framework in this category which more concentrates on the strategies implement procedures. Kaplan & Norton (1992) introduced the original BSC model as a performance measurement tool based on a multi-company study on performance measurement of intangible assets (Kaplan and Norton, 1992). The next year, they first proposed that the performance indicators in the BSC model need to link with the organisational strategies (Kaplan and Norton, 1993). By 1996, the updated BSC model was regarded as a preliminary strategic performance management tool (Kaplan and Norton, 1996). In 2000, by the introduction of strategy map in Kaplan and Norton's new publication, the BSC model achieved an impressive shift from an initial performance measurement tool to an all-encompassing strategic performance management and control framework (Kaplan and Norton, 2000). In 2008, the refined BSC model and the strategic map were explicitly identified as a performance management framework that can help organisations to decompose strategies, objectives cascading, targets setting, allocate resources, budgeting and planning and staffs learning and developing (Kaplan and Norton, 2008). Thus, after a 15-year development, the BSC model is extended and broadened into a most widely used performance management approach for illustrating, communicating, and implementing organisational

strategy (Kaplan and Norton, 2008). In 2006, Harvard Business Review rated the BSC model as one of the 75 most influential ideas of the twentieth century (Bible, Kerr and Zanini, 2006).

The BSC model translates organisational vision and strategy from four perspectives, which is comprised of financial and non-financial performance measurement indicators. Three non-financial performance measures are customer satisfaction, internal business processes, and learning and growth (see Figure 3-6). Each perspective represents a key issue to realize the organisation's success and is all linked to one another through causality. The BSC model starts with vision and strategy and assumes that the top-level goal is to profit enterprise by enhancing financial performance. According to the BSC model's logic, the financial perspective is driven by the customer perspective, that means a company can enhance revenue by satisfying the customers. Then, the customer perspective is driven by the internal business perspective, that means efficient and excellent operation procedures can provide high-quality service and productions for customs. Finally, the internal business perspective is driven by the learning and growth perspective, that means the enterprise should keep improving its capability to support the procedures above. A cause-and-effect relationship embedded in the logical pathway enables the organisation will achieve strategic goals by adopting the BSC model (Kaplan and Norton, 2008).

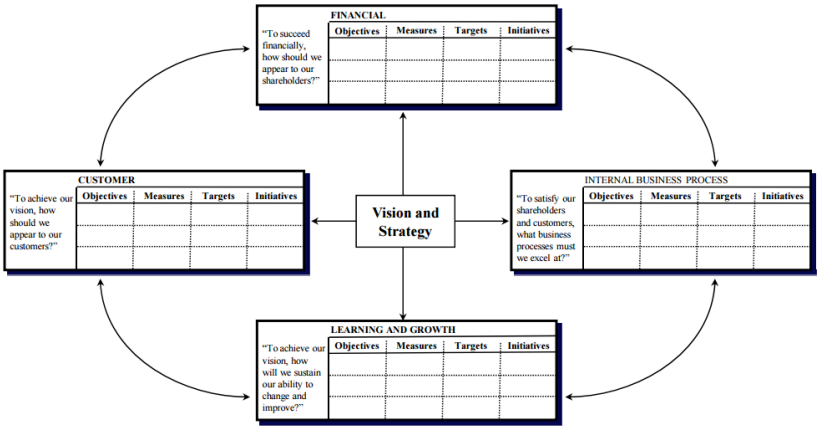


Figure 3-6 The original BSC model (adapted from Kaplan and Norton, 1992)

In 1996, Kaplan and Norton first introduced the visual representation of a cause-and-effect relationship into the BSC model and then extended it to the strategy map (see Figure 3-7) in their research paper in 2000. The strategy map embeds the causal linkage between strategic

objectives with the four balanced scorecard perspectives (Kaplan and Norton, 2000). By using this mapping tools, managers can effectively implement the organisational strategy. The first step is to develop the strategy by translating the organisation's ultimate vision into a set of cascaded objectives. The next step is to comminute these objectives and link them to a reward system. The third step to realize business and financial integration by allocating resources and identifying the priorities. The last step is to develop the strategic learning process by feedback and learning process. The short-term financial objectives together with the three non-financial objectives are measured, which can evaluate whether the strategy developed is effective in achieving the organisation's pre-set objectives and sustainably development (Kaplan and Norton, 2007). In this context, the strategy map makes the BSC model a strategic management tool, which can effectively decompose strategies and link them to operational practices.

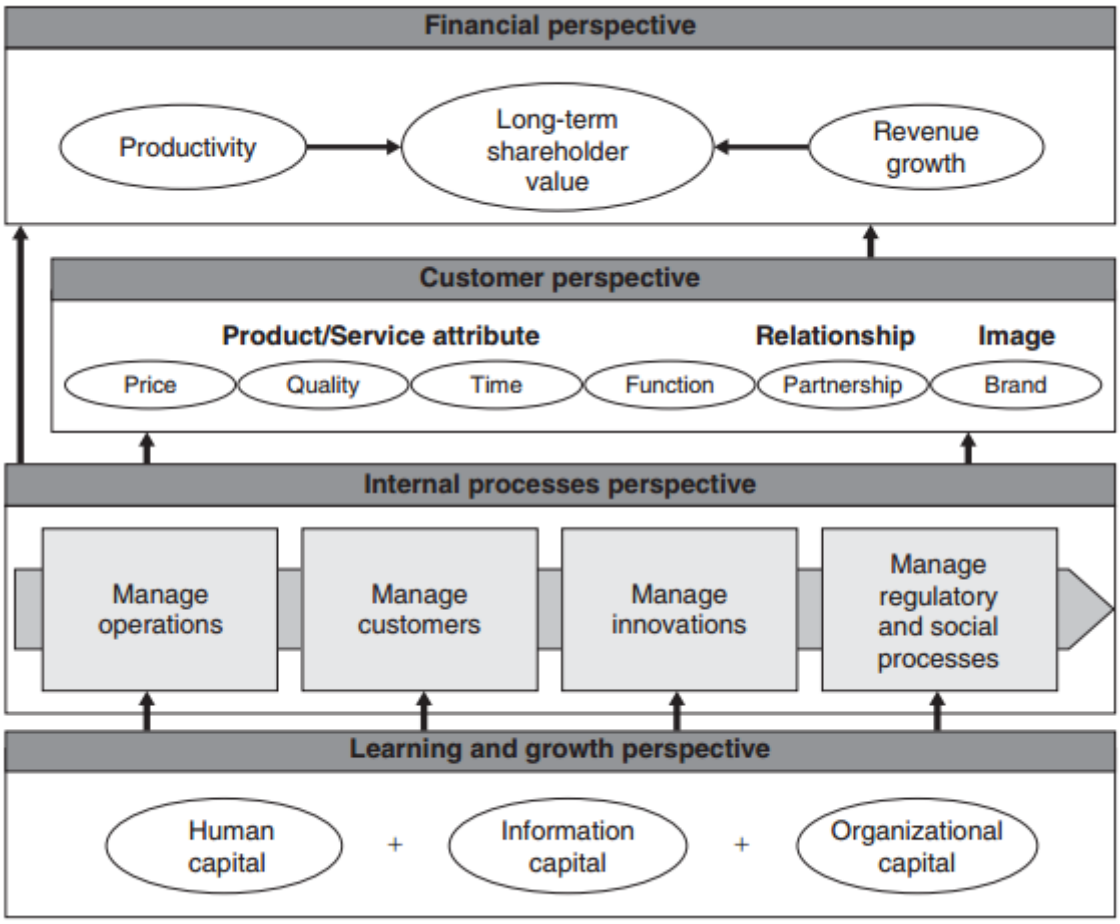


Figure 3-7 Kaplan and Norton's strategy map (adapted from Kaplan and Norton, 2000)

However, the application of the BSC model often limited to private sectors and profit purchasing, because the primary objective of non-profit and public sectors is not the financial success (Irwin, 2002; Kaplan and Norton, 2008). In other words, when non-financial achievement, e.g. social impact, is defined as the ultimate goal of an organisation, the standard architecture of the BSC model is not suitable for direct use. To achieve this the non-financial objectives, the organisation should be accountable for other factors than focusing on raising findings or controlling cost, such as meeting the needs of society (Kaplan and Norton, 2001). To address this issue, some scholars inherit the idea of "balanced scorecard" from the BSC model and, modify the original BSC model to extend the application scope of the method to non-profit organisations, such as the public sector scorecard (PSS) (Moullin, 2002). The author claimed the PSS (see Figure 3-8) is an integrated performance management framework, which extends the original BSC model to fit the visions and features of the non-profit and public sectors. The fundamental logic of is that the outcomes including service user, strategic and financial results could be achieved with the corresponding processes supported by key capability, behavioural and organisational factors. The supportive elements of enabling factors often involve training and motiving staffs, establish good partnerships with external stakeholders, obtaining sufficient resources, building innovation and learning organisation culture instead of a top-down blame culture, and developing effective leadership (Moullin, 2009).

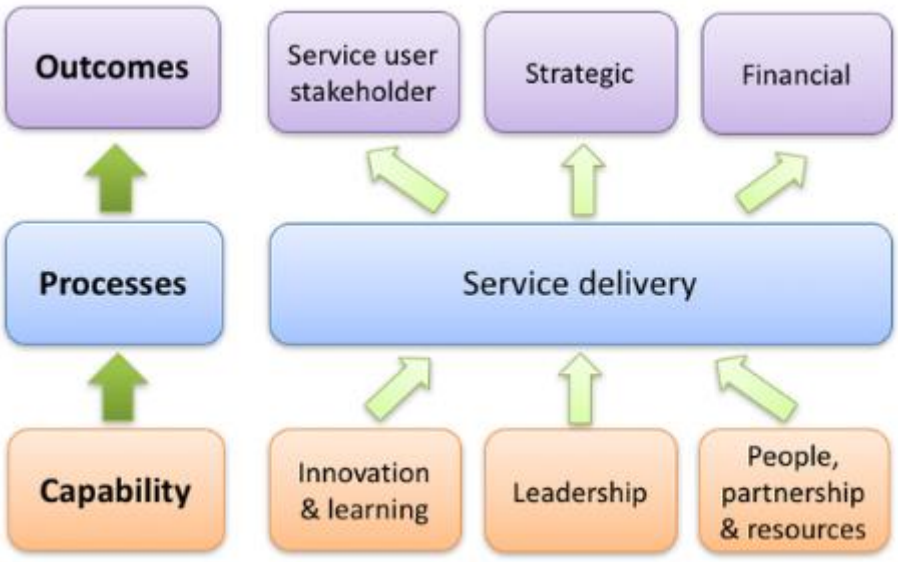


Figure 3-8 The Public Sector Scorecard (adapted from Moullin, 2002)

The performance prism (PP) is developed by Neely and his colleagues (2002) in response to the solving the issue of bounded stakeholder focus in the BSC model (Atkinson, Waterhouse and Wells, 1997; Ahn, 2001; Neely, Adams and Kennerley, 2002). The PP framework (see Figure 3-9) embraces a stakeholder-centric view of strategy, that defines organisational strategy and strategic goals in terms of various stakeholders. It has five inter-related components:

1) The contribution of stakeholders: what organisation need from its stakeholders based on a reciprocal perspective;

2) The strategies: what strategies the organisation needs to develop that could satisfy both organisation itself and its stakeholders. The contents of strategies could involve aspects of the corporate, business unit, brands, products, service, operating;

3) The processes: what key processes the organisation needs to carry out following with the defined organisational strategies. The detailed contents include developing products and services, generating demands, fulfilling demands, planning, and managing the enterprise;

4) The capabilities: what capabilities the organisation needs to fulfil and enhance the requirements of strategies implementation. Specifically, it will involve the aspects of people, practice, technology, infrastructure;

5) The satisfaction of stakeholder: who are the key stakeholders of the organisation, and what are their interests and expectations. The PP framework proposes five categories of key stakeholders for helping an organisation's identification, i.e. investors, customers and intermediaries, employees, regulators and communities, suppliers (Neely, Adams and Kennerley, 2002).

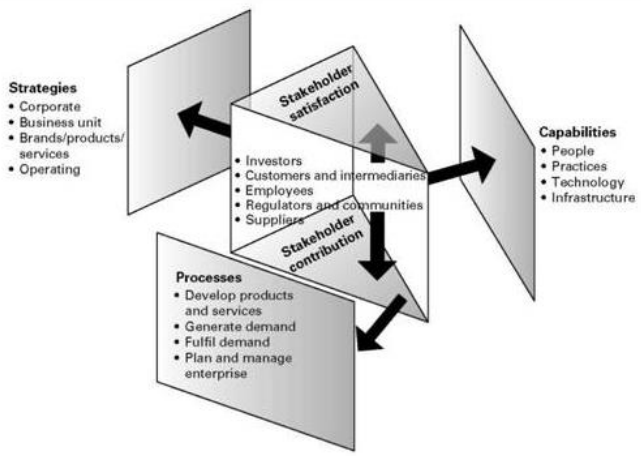


Figure 3-9 The Performance Prism framework (adapted from Kennerley and Neely, 2002)

In the PP framework, stakeholder contribution stands at the input end, providing all the invested resources which the organisation needs. Then, strategies, processes, and capacities are three dimensions of the causes of the PP framework. Organisation converts all the inputs into desired outputs by these causes. Stakeholder satisfaction, as the universal mission of organisations, conducts the end of the performance management processes (Kennerley and Neely, 2002). The framework enables managers to execute strategies consistent with different types of stakeholders' demands and to implement strategies effectively with necessary resources and capabilities. In this sense, the PP framework is more comprehensive than many of the other existing performance management frameworks (Ates *et al.*, 2013), such as the BSC model.

The PP framework also provides a mapping approach, which is called the success map (see Figure 3-10). Following the causal relationships between the different perspectives of the framework, it delves into the key operational processes of the organisation intending to create value for its various stakeholders. Conversely, a risk map with reverse processes can also be developed (Neely, Adams and Kennerley, 2002). It is a less prescriptive approach than the strategy map in the BSC framework.

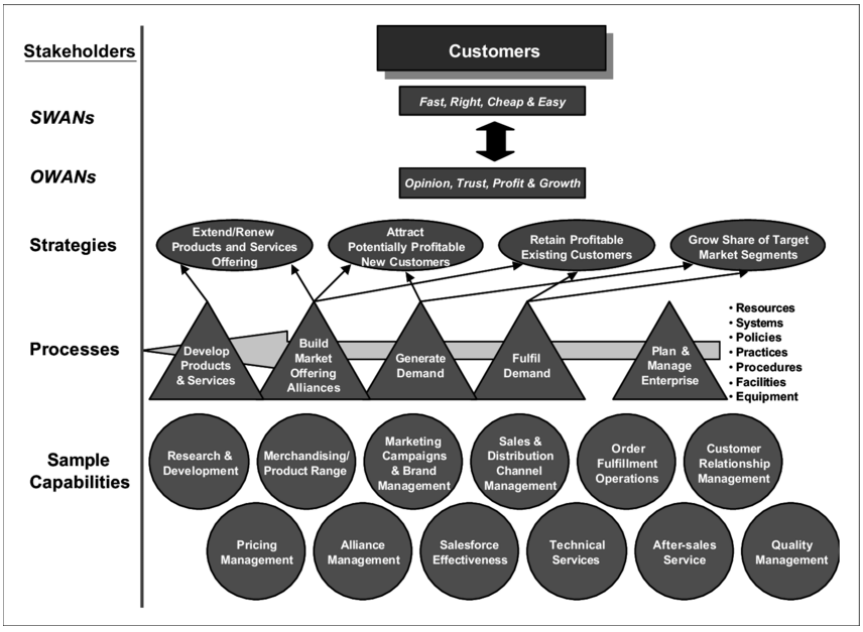


Figure 3-10 The success map of the PP framework (adapted from Kennerley and Neely, 2002)

Despite the comprehensiveness, the PP framework has many weaknesses. For example, Stakeholder satisfaction is not easy to be equipoised, as there are numerous stakeholders of an organisation. Likewise, identifying the stakeholders' contribution is a challenging job for the

organisation as there are no effective methods to be adopted. Nevertheless, its static nature is challenging to adopt an ever-changing environment for a firm (Stiakakis and Kechagioglou, 2006). Moreover, it is challenging for developing and maintaining an overall PP system. Applying the PP framework into practice could be both times consuming and resources intensive. In this sense, the above weaknesses could undermine the PP framework's feasibility and effectiveness in practice.

Zhen (2019) and his colleagues developed an innovative performance management framework, the balanced stakeholder model (BSM), for the public sector based on the Soft System Methodology (SSM). The BSM framework is a stakeholder-oriented performance management framework. It aims to answer two critical issues in public sector performance management. One is to translate the complex public objectives and strategies into a series of manageable key actions or process. Another one is to find out critical factors (balancing key stakeholders' interests in the BSM) for public sectors to achieve and enhance overall objectives. This model also develops a practical method to guide public sector on how to identify their key stakeholders and balance their interests (Zheng *et al.*, 2019). Specifically, the BSM framework has a similar management structure with the BSC model. The five fundamental elements in BSM framework are strategy, goal, operation, stakeholder and capability (see Figure 3-11). The management logic in the BSM framework is 1) the development of strategy needs to consider the goal, stakeholder, operation and capability four aspects; 2) the starting point of strategy development is defined organisational goals; 3) the analysing of organisational goals needs first to identify the key stakeholders, then to balance their interests; 4) achieving the identified organisational goals depends on suitable operations and high-level capabilities. In comparison with other performance management framework, the BSM framework focuses on a broad scope of key stakeholders and emphasises on balancing their interests, which are believed extremely important in the public sectors. Hence, it is more suitable for public sectors or non-profit organisations.

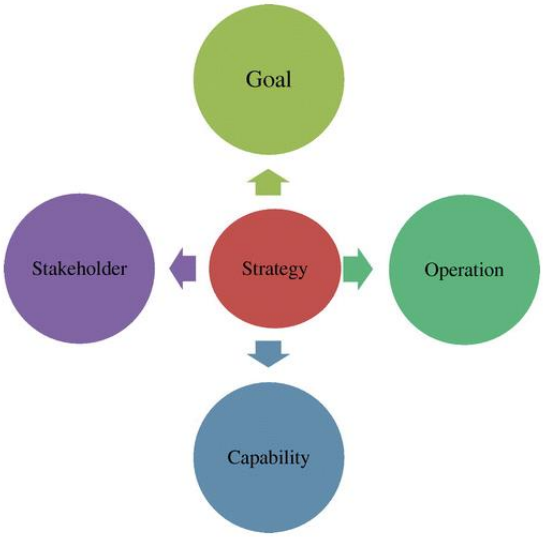


Figure 3-11 The four dimensions of the BSM framework (adapted from Zheng *et al.*, 2019)

Zheng (2017) proposed a systematic and integrated performance management approach, namely the performance tree framework. Zheng's performance tree framework includes two main parts, and one is developing performance tree with the key stakeholders of organisational objectives and strategies, another one is managing the designed performance tree by design action or process chains and action units. The concept of Zheng's performance tree focuses on the generation procedure of organisational performance that is mainly through action or process chains. The developed management framework based on action or process chains is composed by five key management elements: 1) organisational objectives or strategies, key stakeholders, action or process chains, performance metrics and performance groups (Zheng, 2017).

In detail, the first part of the framework is to construct a performance tree according to the organisation's key objectives and strategies. The processes of construction can be grouped into three situations. First, if the existing operation processes are suitable for achieving the objectives, the organisation can build the performance tree model by just applying such as BSC model to decompose its organisational objectives and strategies straightforward in a top-down manner. Second, if the existing operational processes need particular improvement to achieve the objectives, the organisation can build the performance tree model by applying such as EFQM excellence model to assess and adjust the initial actions or processes. Third, if the organisation needs to redesign its operations partly, SSM can be used to help build a performance tree. In practice, the above performance management approaches can be used in combination according to different situations.

The second part of the framework is carrying out action-oriented management approaches to manage the designed performance tree. The author recommends using the Key Performance Indicator (KPI) and performance plan in this stage. The KPIs' approach enables the organisation implementing its strategies/objectives effectively. Furthermore, the performance plans help employees accomplish their performance targets with a clearer path and more robust supports.

The design of a performance management system for an organisation by utilising Zheng's Performance Tree Management Framework is not necessarily totally following the existing organisational structure or chart, while depends on the management demands and the experience of the system designer. Therefore, the newly designed performance tree structure could help the organisation renovating and optimising its internal structure. In the other hand, the integration of using most of the current performance management approaches into the performance tree framework proves it is a unified framework for performance management (Zheng, 2017).

Compared with the most widely used BSC model, Zheng's performance tree framework has the following three advantages:

The BSC model might hinder the potential structure reformation in the organisation as it highly relies on an organisation's existing operations and formal structure. In contrast, the performance tree framework can optimise the structure of the organisation and promote organisational reformations.

The BSC model is not suitable for certain organisations such as non-profit organisations and hi-tech enterprises as it builds up a performance tree management system through fixed four-dimension in a top-down way while the performance tree framework can be utilised in the more extensive organisation.

The BSC model is a rigid approach as it must start from a clear objective and strategy. While the performance tree framework is very flexible, it can be formed without a clear task even form the system in a bottom-up manner.

3.2.2 Performance management frameworks based on standardisation

The performance management frameworks in this category mostly have a core idea that effectively linking the way the organisation is expected to best practice could lead to high

performance (Ates *et al.*, 2013; Biron, Farndale and Paauwe, 2011). This type of framework often integrates various managerial elements towards desired organisational performance, which leads it to be a comprehensive management model, including most management aspects of a generic organisation. Some scholars believe these frameworks can reliably reflect the principles of quality management (Sousa and Voss, 2002; Sousa and Voss, 2002; Corredor and Goñi, 2011). Moreover, this type of performance management frameworks also provides a tool for benchmarking, which can help organisations compare their process, performance, products or services, against industry-leading practices to find out the improvement gap and possible solutions, and then to improve their performance by learning the selected best practice in the industry (Karkoszka and Szewieczek, 2007; Tavana *et al.*, 2011). Thus, the starting point of this type of performance management frameworks is not a specific organisational objective or strategies, but a standardised practice that is believed can help the organisations to realise business excellence and success.

The EFQM excellence model was created by fourteen presidents of European companies in 1988. People also call it a Business Excellence Model (BEM) or award model because of its ranking function. The EFQM excellence model, along with the Baldrige Excellence Framework, are the most extensively used BEMs in the world (Talwar, 2011; Escrig and de Menezes, 2016).

In 1988, with the support of the European Commission, the European Foundation for Quality Management was founded by 14 European business leaders with the aim to increase the competitiveness of European businesses(Conti, 2007). In 1992, the EFQM excellence model was introduced as a framework to support the assessment of the applicants for the European Quality Award (EQA) and to identify excellent companies in European (Bohoris, 1995). Andersen, Lawrie and Shulver (2000) further argued that the EFQM excellence model could be used to help the organisations, who desire to achieve business excellence, to continuously improve their management and learn best practices in the industry. The EFQM excellence model is regularly updated to cope with the development of management concepts, knowledge and technology. Until now, the EFQM excellence model has been developed into a comprehensive management framework. In Europe, over 30,000 organisations from different industries have adopted this framework for their performance management practice (Escrig and de Menezes, 2016). At the end of 2019, the latest version, EFQM excellence model 2020, was released. However, in this study, the last version of the EFQM excellence model, namely the EFQM excellence model 2013, was reviewed at the beginning of this study.

The EFQM excellence model consists of eight fundamental elements/components:

1) Adding value for customers. The EFQM excellence model believes that the ultimate value of a business is to create value for its customers. Therefore, the organisation needs to understand and anticipate the needs and expectation of its customers.

2) Creating a sustainable future. The EFQM excellence model proposes that one of the measures of achieving excellence is the sustainable development of the organisation on the economy, environment, and society.

3) Developing organisational capability. The EFQM excellence model believes that the organisational need to value the development of organisational capability. Hence, an organisation should continuously enhance its organisational capability by various means.

4) Harnessing creativity and innovation. The EFQM excellence model argues that modern organisations need to enhance their competitiveness and performance through continual improvement of systematic innovation and creativity.

5) Leading with vision, inspiration and integrity. The EFQM excellence model emphasises the importance of leadership and its key contents, such as acting as models for the organisation's values and ethics.

6) Managing with agility. The EFQM excellence model believes that identifying and responding timely to opportunities and risks are also important for improving an organisation's performance.

7) Succeeding through the talent of people. The EFQM excellence model emphasises the value of talents and put forward the role of an appropriate culture building in helping talent development.

8) Sustaining outstanding results. The EFQM excellence model emphasises, to evaluate business results, the organisation must consider the short term and long-term needs of its (key) stakeholder.

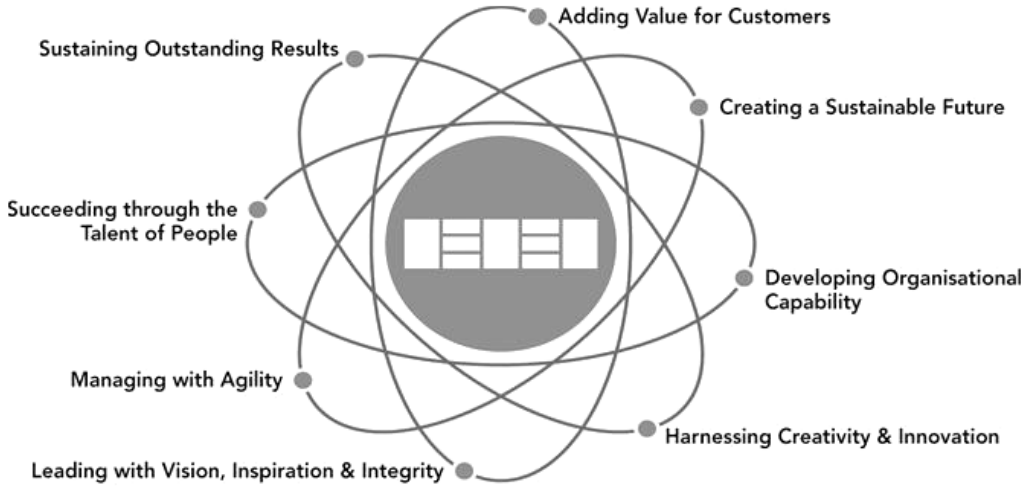


Figure 3-12 The fundamental concepts of the EFQM excellence model (Adapted from EFQM excellence model 2013)

The EFQM excellence model has nine key criteria (see Figure 3-13). Each key criterion has a definition with a high-level meaning. In the next level, a total of thirty-two criterion parts support these nine key criteria to develop high-level meaning. Each of the criterion parts is a brief summary of one category of best practices in excellent organisations with some examples. In the next level, there are guidance points, which provide some explanation for the criterion parts, relating to the EFQM excellence model's eight fundamental concepts (Gómez Gómez, Martínez Costa and Martínez Lorente, 2011).

The nine key criteria of the EFQM excellence model can be categorised into two logic parts, namely the enabler part and the results part. The “Enablers” part includes five key criteria. They are the operational and managerial inputs that are essential for business excellence organisations. The “Results” part includes four key criteria, which consists of expected achievements linked from the previous part that business excellence organisations need to consider and evaluate (Heras-Saizarbitoria, Marimon and Casadesús, 2012).

The nine key criteria of the EFQM excellence model are briefly described as follows:

Enabler criteria:

1) Leadership

   This criterion specifies the standard of good leadership. The contents include developing long-term plans, following the organisation's value and leading by example, driving the improvement of the organisation's management system and overall level performance,

establishing an excellent organisation culture, coping the change and keeping the organisation flexible. Strategy-Excellent organisations implement their mission and vision by developing a stakeholder focused strategy. Policies, plans, objectives and processes are developed and deployed to deliver the strategy.

2) Strategy

This criterion specifies the standard of good strategy and its implement. The contents include developing organisation strategy with stakeholders centred orientation, developing organisation strategy with the considering of internal performance and internal abilities, reviewing and updating the defined strategy regularly, developing policies for supporting the organisational strategy, implementing and communicating the organisational strategy effectively.

3) People

This criterion specifies the standard of proper human resource management. The contents include developing personnel plans according to the organisational strategy, training and developing employees' knowledge and abilities, aligning and engaging with the people in the organisation, empowering employees legitimately, communicating effectively throughout the organisation, motivating, recognising and respecting people in the organisation.

4) Partnership and Resources

This criterion specifies the standard of managing external partnerships, suppliers and internal resources. The contents include the related planning and activities can support the organisation's strategy, policies and core operational process, managing the organisation's environmental and societal impact effectively, considering sustainable benefits for external partners and suppliers, managing finance and material resources successfully, developing and learning supportive technologies for division making and competitive power enhancement.

5) Processes, Products and Services

This criterion specifies the standard of good process, products and services. The contents include designing and optimising the process to increase the value for customers, developing products and services aiming to create value for customers, promoting and

marketing the products and services, delivering the products and service to the customers effectively, managing and enhancing customer relationships.

Results criteria:

6) Customer Results

This criterion specifies the standard of excellent business results from a customer perspective. The contents include analysing the demands of customers regularly, achieving sustainable and significant results that can meet even exceed the demands of customers, managing customers' satisfaction through performance evaluation.

7) People Results

This criterion specifies the standard of good people results from an employee perspective. The contents include analysing employees' perceptions of the organisation, achieving significant results that meet even exceed the need and expectations of the employees, managing the employees' performance effectively.

8) Social Results

This criterion specifies the standard of good social results from a social impact perspective. The contents include analysing society's perceptions of the organisation, achieving significant results that meet even exceed the need and expectations of relevant stakeholders within society, managing the social impact related performance effectively.

9) Business Results

This criterion specifies the standard of good overall business results. The contents include analysing society's perceptions of the organisation, achieving desired financial and non-financial performance, achieving desired operational performance, achieving significant results that meet even exceed the need and expectations of the organisation's business stakeholders.

The arrows at the bottom of "learning, Creativity and Innovation" means the Enablers can be adjusted by the results through the processes of learning, Creativity and Innovation. In other words, learning, Creativity and Innovation can help the Enablers to maximize the Results (Jaeger and Matyas, 2016).

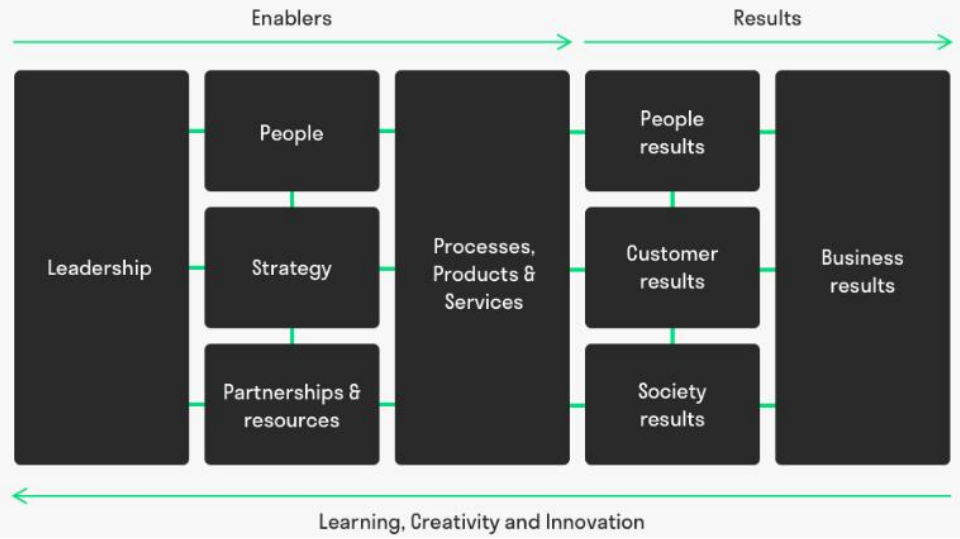


Figure 3-13 The criteria of the EFQM excellence model (Adapted from EFQM excellence model 2013)

The RADRA logic (see Figure 3-14) is an accessible but very effective management tool. Furthermore, its managerial logic is straightforward, that is structuring improvement project by five easy-to-understand processes to drive the continuous improvement of an organisation. In the EFQM excellence model, the RADRA logic is adopted as an assessment and management model for evaluating and improving the approaches an organisation has implemented (Bolboli and Reiche, 2015).

The five processes of RADAR logic can be interpreted by five questions:

1) Results-What is the organisation trying to achieve?
2) Approaches- How do the organisation try to achieve the objectives?
3) Deploy -How/ Where/ When are the approaches implemented?
4) Assess-How does the organisation measure its outcomes?
5) Refine-What has the organisation learnt, and what improvements can be made?

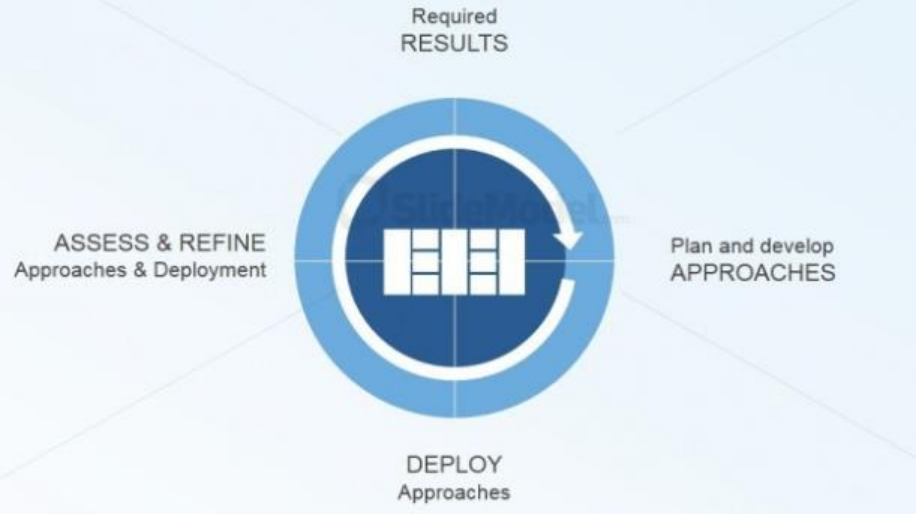


Figure 3-14 The RADAR logic of the EFQM excellence model (Adapted from EFQM excellence model 2013)

In summary, by adopting best practice logic and benchmarking method (Rolstadås, 1995), the EFQM excellence model provides a global view of performance management, as well as a standard of how to combine different management tools and techniques. In this sense, the role of the EFQM excellence model is:

- A tool for accurately assessing the capability of an organisation,
- A channel to understand the status of an organisation,
- A guide for an organisation to address its shortcomings,
- A structure for the management system of an organisation to achieve excellence.

The Baldrige National Quality Award (MBNQA) Excellence Framework (see Figure 3-14) is another similar framework that is initiated in the US. It was first established by the U.S. Commerce Department in 1987, adopting the best-practice logic and benchmarking method to recognize performance excellence in MBNQA. The Baldrige Excellence Framework provides a performance management model with a structure of seven categories. It provides a set of criteria for performance excellence and, a serious of guidelines for evaluating organisational processes and results. The MBNQA excellence framework is developed based on the leading edge of validated leadership and management practice and is grounding on a set of core values and concepts for achieving high-performance and business excellence. The framework is introduced to help organisations to promote their performance excellence and to share

summarised successful performance practices, methods, and strategies in the industries (Wilson and Collier, 2000).

The seven categories of the MBNQA excellence framework are interpreted as below:

1) Leadership - How to manage the organisation by top management, how to develop a governance system, including senior managers' behaviour portray, for the organisation.

2) Strategy - How to develop organisational objectives and strategies, how to implement and evaluate the organisational strategies, how to adjust the organisational strategy depending on the change of situation.

3) Customers - How to obtain information about the demands of customers, how to build and maintain the relationships with customers, how to meet the customers' expectations.

4) Measurement, Analysis, and Knowledge Management - How to align the operational processes with the organisational objectives and strategies, how to measure the organisational and individual performance, how to improve organisational innovation and competitiveness by utilising the performance measurement information.

5) Workforce - How to train and develop staffs' capabilities, how to create and maintain a high-performance environment, how to deal with change from the workforce perspective, how to enhance staffs' engagement.

6) Operations - How to link operations, products and services design, and innovation to the organisation's strategies and future success.

7) Results - This category summarises comprehensive results that an excellent organisation demands. The results include production results, customer satisfaction results, human resource results, leadership and governance system results, overall financial and market performance outcomes.

Figure 3-15 Malcolm-Baldrige Quality Award Framework (adapted from MBNQA, 2007)

In the MBNQA Excellence Framework, category 1, 2 and 3 in the left side represent the processes of identifying the objectives and further developing and developing the strategy, category 5 and 6 in the right side represent processes of implementing strategy. Category 4 is the core of the framework, represents the organisation's overall measures of improvement (Karimi *et al.*, 2014).

The Business Excellence Models (BEMs), often representing the EFQM excellence model, the MBNQA excellence framework, etc., provide a set of standards of management practices aiming to achieve business excellence. This study proposes that they can be called as standard performance management models. They can be applied to all organisations having the objective of business excellence and high performance. This type of performance management frameworks often has management logic with a "generic" cause and effect mechanism. The most significant advantages of the BEMs are their standard feature could simple the performance management system designing process and, the benchmark can help the organisation compare and learning the best practice in the industry for continuous performance improvement. (Andersen, Lawrie and Shulver, 2000).

Specifically, in terms of the cause and effect management logic in the BEMs, the causal relationship of each category has not been examined and proved (Carlos Bou-Llusar *et al.*, 2005; Heras-Saizarbitoria, Marimon and Casadesús, 2012). Hence, BEMs are not prescriptive

in nature. However, although BEMs lack a clear interrelationship among their component categories, the industry has a general consensus that a business excellence system can have a positive influence on desired results. The MBNQA Excellence Framework proposes that the leadership, strategic planning, and customer and market focus categories can affect the results categories (workforce, process, and overall results) (MBNQA, 2007). Similarly, the EFQM excellence model states that excellent results can be influenced by leadership and relating organisational policies and strategies. Meanwhile, leadership is affected by people, partnerships and resources, and processes (EFQM, 2013). Moreover, the BEMs emphasise, to improve desired results, the organisation needs to drive the implementation of business excellence systematically with the intention (Black and Crumley, 1997). In this sense, the logic behind the BEMs is that by improving the organisation's operation and management processes by identified management tools, there will be an inevitable enhancement in the results of performance.

Comparing with the framework of performance management discussed here, i.e. EFQM and the Baldrige Excellence Frameworks, to those with a clear and particular strategy, the BEMs give more details about how organisations implement self-assessment based on management and operations diagnoses. The specific advantage of BEMs is involving benchmarking, which not only assess the organisation's performance management but also could provide the opportunity to learn the best practices from other organisations (Gómez, Costa and Martínez Lorente, 2015).

The BEMs also have some shortcomings (Karimi *et al.*, 2014). Due to the adoption of a standardized performance benchmarking mode, the BEMs are all-inclusive performance management frameworks. Therefore, companies that apply a BEM often need to invest high costs to implement all aspects of BEM’s tasks. In fact, many enterprises, especially small and medium-sized enterprises, only need to improve the performance management of certain aspects according to their own shortcomings. However, BEMs do not provide a similar solution. Therefore, it is difficult for SMEs to apply the BEMs. Moreover, the BEMs do not involve the logical relationship between itself and specific organisational goals or strategies in practical applications (Balbastre-Benavent and Canet-Giner, 2011). Therefore, since companies implementing BEMs are not closely related to its pre-set organisational goals/strategies, the actual performance improvement effect is likely to be greatly reduced.

3.2.3 Other performance management approaches and frameworks

Subgroup 1 Operation management-oriented approaches

The approaches in this category emphasise the alignment of various operation and administration units within an organisation and, intend to ensure all the units are synergistically working for the organisation to achieve a centralised set of objectives. Researchers have done much work from different perspectives for reviewing and optimising the operations of the business and administration units, such as optimisation based on industrial features (Subramony, 2006), utilising technologies innovation and information technology applications (Bourne, Franco and Wilkes, 2003; Chourides, Longbottom and Murphy, 2003), the impact of managerial incentives and ownership (Westman, 2014; Wendt, 2014), and fostering organisation and business culture (Ottenbacher and Harrington, 2007; Chan, Shaffer and Snape, 2004; Henri, 2006).

Many methods of management science are useful in these four blocks. For instance, the soft systems methodology (SSM) can help to address the negative impact of evolving strategies as it suits solving new problems where there is neither consensus about how to define the key issues nor how to solve it. The SSM is developed by Checkland (1972) as an initial general-purpose problem-solving methodology based on a system view (Mingers, 2000a), and its core is an action-oriented process for understanding the problems and finding out a recognised way to improve or solve it. SSM is widely applied in the different types of organisations, from small-and-median enterprises to large corporations, and scenarios, including both private firms and public sectors (Checkland and John, 2010). Especially, positive performance management results are shown in many public sectors and government projects (Crawford *et al.*, 2003; White, 2000; Liu *et al.*, 2010; Liu *et al.*, 2012; Zheng *et al.*, 2019; Crawford *et al.*, 2003; Liu *et al.*, 2010, 2012; White, 2000). Meanwhile, some scholars believe the SSM can be used either by itself or accompany other methods for achieving the effectiveness of performance management improvement (Checkland, 2000; Mingers, 2000a).

Moreover, data envelopment analysis (DEA), cluster analysis and factor analysis, forecasting techniques and critical path analysis will play a role in analytic techniques (Medina-Borja, Pasupathy and Triantis, 2007).

Business Process Reengineering (BPR) is a representative approach in this area. Many scholars believe the process management is not only about input and output, such as cost and quality, but also needs to focus on the flexibility and responsiveness of the process, they all are the

basis of competition. Hammer (1990) and Davenport and Short (1990) first introduced BPR, which is a new methodology to manage the operational process and is aiming to create a sustainable competitive advantage for the organisation. Meanwhile, the BPR method can produce significant enhancement for performance management (Hammer, 1990; Davenport and Short, 1990).

Davenport and Short (1990) believe BPR is mostly about analysis and then design, redesign or improve the operational process or business process within an organisation. Sometimes it also can be used between several organisations. Other scholars argue the BPR is similar to total quality management (TQM) in terms of their underlying management logic. These two management methods all focus on design and improving the operation or business process for the enhancement of production and services. However, these two methods do not directly show the link between process improvement and organisation's specific objectives and strategies (O'Neill and Sohal, 1999).

When applying the BPR method, there is no acknowledged specific process and techniques for organisations to analysis and reengineer their operation or business processes. A majority of BPR practices believe that different process or tools need to be developed for the best reengineering application to radically improve operation or business process (Valiris and Glykas, 1999). Here are some examples:

- Process visualisation. Barrett (1994) points out that a perfect vision of the process is important for successful reengineering (Barrett, 1994).
- Process mapping in operational method study. Cypress (1994) states that the important role operational method studies playing in reengineering approach are often being overlooked. This idea is late accepted by some process reengineering tools such as IDEF (Integrated Definition Method), DFD (Data Flow Diagrams), OOA (Object Oriented Analysis) (Yu and Wright, 1997).
- Change management. Some scholars emphasize the reengineering of the human side, in particular organisational change management, should be taken into account (Mumford and Beekman, 1994).
- Benchmarking. Some scholars propose benchmarking as a key part of reengineering since it allows the organisation to learn the best practice in others (Brian Harrison and Pratt, 1993).

- Process and customer focus. Some other scholars insist that improving performance from the customer's perspective is the principal objective of BPR (Vantrappen, 1992).

Similarly, there is not a standard framework or model that can be used to guide the organisation's managers through the procedure of innovation and change. Motwani *et al.* (1998) designed a six-phase comprehensive BPR framework (see Figure 3-15). The six-phases includes understanding, initiating, programming, transforming, implementing, and evaluating.

The first phase, the senior managers must identify the need for change, and understand how they plan to achieve it by BPR.

The second phase, a vision should be shaped, then the target business processes should be identified for redesigning and measuring. At the same time, the reengineering project teams should be formed as well.

The third phase, the project team first evaluates and records the existing processes, then find out the problems of current processes, further establishes baselines and benchmarks for identifying the improvement gap, with the aim of identifying opportunities for redesigning or engineering new business or operation processes.

The fourth phase, the project team first undertakes a pilot study. If it is successful, an actual transformation will be carried out to the redesigned process for the organisation.

The fifth phase, the project team implements and integrates the defined reengineering processes in the organisation. For achieving a complete and successful transformation, this procedure will further involve employees and line managers training, management structure alignment, resources reallocation, human resources redeployment, and technology upgrading, etc.

The final phase, the project team will evaluate the results of the reengineering process against the pre-set project goals and performance objectives established in phase two. This phase is as important as the reengineering process, as only a successful reengineering outcome could make

the BPR beneficial for the organisation that has just carried out substantial changes in its business processes (Motwani *et al.* 1998).

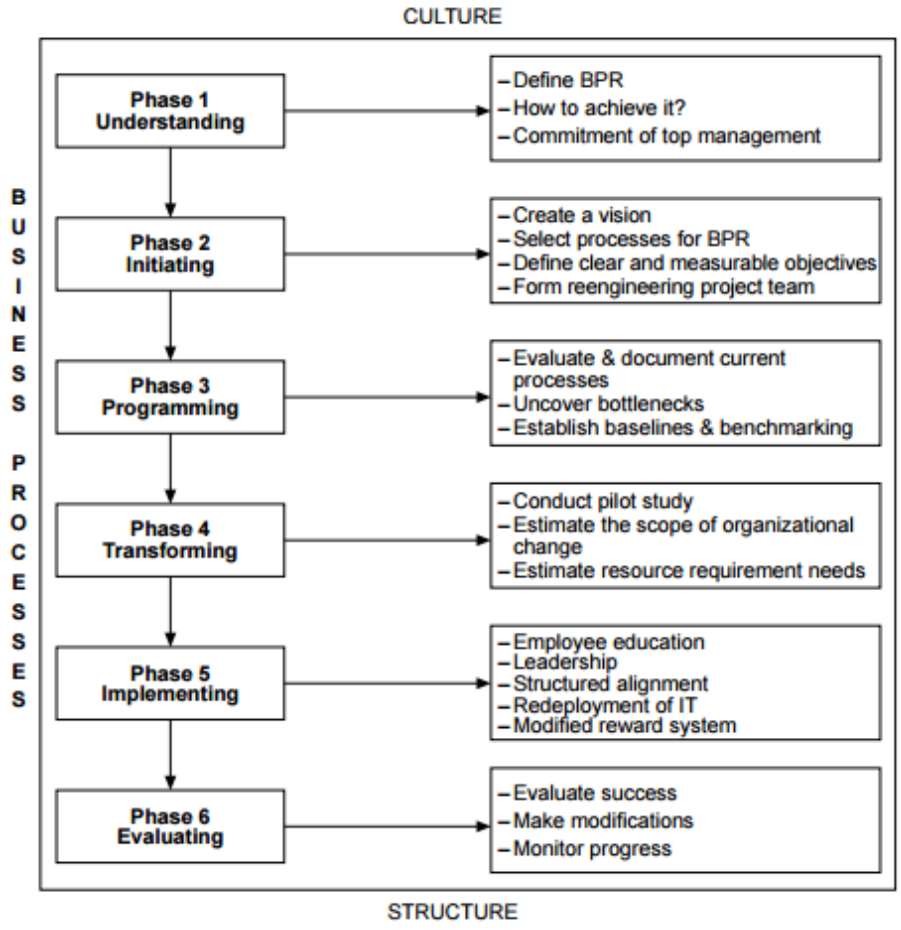


Figure 3-16 The practical framework on BPR (adapted from Motwani *et al.* 1998)

To this end, the implementation of BPR usually has a considerable impact on all aspects of an organisation, not just redesigning its business processes or operation processes. An organisation must need great courage to make a decision to implement BPR, even when there are critical problems in their business processes. Therefore, the BPR is not as popular as other traditional performance management frameworks, e.g. BSC model, EFQM excellence model, in practice (Burgess, 1998).

Subgroup 2 Human resource management-oriented framework

Some performance management frameworks put more emphasis on human resource management than others. The most well-known framework is High Performance Work System (HPWS).

HPWS is based on bundles of human resource practices. Huselid's (1995) ground-breaking research of HPWS is recognised as the beginning point of studies verifying empirical relationships between human resource and performance (Paauwe, Guest and Wright, 2013). After that, in a research of American manufacturing industry, the scholars state that HPWS can increase employee's engagement, enhance their skills and motivation, which can lead to high performance (Appelbaum *et al.*, 2001). Another meta-analysis of 93 pieces of research on the relationship between human resource and organisational performance shows that an increase of one stand deviation in the use of high-performance work practice is associated with a 4.6 per cent increase in return on assets, and with 4.4 percentage point decrease in turnover. Therefore, the impact of an HPWS on organisational performance is not only statistically significant but managerially relevant (Appelbaum *et al.*, 2001).

The aim of an HPWS is to establish a performance culture, which provides ways for people to consider and improve performance in an organisation. The approach of an HPWS is to develop and implement an integrated package of complementary practices, that might have more positive effects on performance than if these processes are used separately. However, the HPWS does not have a universally agreed definition nor the essential components of this system. Some scholar defines HPWS as: "An internally consistent and coherent human resource management system that is focused on solving operational problems and implementing the firm's competitive strategy" (Becker *et al.*, 1998, pp. 55) There are different models of the HPWS, as shown in Table 3-1.

Table 3-1 Different types of HPWSs and their components

US Department of Labour (1993)	**Appelbaum *et al.* (2001)**	**Sung and Ashton (2005)**	**Thompson and Heron (2005)**
• Careful and extensive recruitment, selection and training system. • A formal system for information sharing with both organisation and staffs. • Clear job design.	• Work is organised to enable frontline workers to participate in decisions that improve the organisation's routines. • Workers need more skills in order to complete their work,	• A high degree of engagement, such as a highly autonomous team, a high degree of sharing / access to company information, etc. • Efficient human resources practice - such as perfect recruitment process,	• Achieve information sharing within the organisation. • Efficient recruitment system. • Formal induction system for employees. • There are five days or more off-the-job training programs every year.

• Extensive participation processes. • Monitoring of attitudes. • Performance appraisals. • Perfect appeal system. • Rewards and promotion programs to recognise and compensate employees with high performance.	which includes company specific skills successfully. • Workers have greater autonomy in work tasks and work methods. • Incentive pay to motivate workers to increase their efforts to develop skills. • Employment security allows frontline workers to obtain career development within the company and protect their future interests.	effective performance evaluation, sufficient job guidance, humanised career development. • Pragmatic rewards and commitments-such as various financial incentives, family-friendly policies, job rotation and flexible working hours.	• Highly or fully autonomous work teams; a continuous improvement team, problem-solving team. • Employee interpersonal ability development system. • Performance feedback system throughout the organisation. • Employee involvement in management, such as the establishment of a labour council, the establishment of advice channels, and the conduct of opinion surveys. • Team-based reward system, such as employee stock ownership plan, organisation profit distribution plan.

Shih, Chiang and Kim (2005) attempted to summarise the fundamental components of an HPWS, which include: arranging job infrastructure, establishing training and developing schemes to improve staffs' skills, instituting information sharing and staff engagement mechanism and providing reward and promotion opportunities that provide motivation. From this sense, the fundamental processes of HPWS are similar to those of regular performance management system from human resource respective, yet the former puts more emphasis on the integration of processes and embody 'best practice'.

Human resource management-oriented performance management frameworks often have an assume that developing and enhancing the employees' performance can ultimately achieve and improve organisational performance as well, building a meaningful connection between

changes in individual-level performance and changes in organisation-level performance has always been a desired objective (DeNisi and Smith, 2014).

Subgroup 3 Performance management theoretical frameworks for research

Some scholars propose performance management approaches or frameworks form other angles, such as economic models (Speckbacher, 2003), information-based models, systemic couplings models (Demartini, 2014), etc. Usually, this kind of models is too abstract for direct practical use, yet they could be useful for understanding the processes and mechanisms of performance management.

Speckbacher (2003) proposed three economic models for performance management from the perspective of its foundation through.

Model 1: The Technological View of the Firm

From the view of traditional microeconomic theory model, the firm can be considered as a technology set which the core is to maximize the firm's profit. In this view, the firm is seen as a black box. Therein, the resources are considered as inputs that can be converted to achievements as outputs. Thus, the core issue is to fully understand the internal structure and procedure of the black box and, to clarify whether the conversion process is efficient. This model is applicable to most traditional cost accounting and management accounting systems (Speckbacher, 2003).

However, this model is not suitable for the system who do not take profit as its objectives, such as university and hospital. Moreover, this model is too conceptual to specify where the objective and strategy come from and how to implement the strategy in practice.

Model 2: The view of the firm in the traditional property rights literature

From the view of traditional property rights model, the firm is regarded as a bridge of interrelated and complete contracts between the suppliers as inputs and the purchasers as outputs. The contracts identify the corresponding obligations and incomes of the parties such as employees, suppliers and customers, except the owners. The owner or shareholders obtain the residual profit and take residual risks per contra, which resulted that they have the residual decision right. This mechanism is why owners or shareholders have the authority to control the firm by this view.

By focusing on ownership and the mechanism of control and incentives, the traditional property rights view is considered as the basis of the shareholder value-based performance management systems.

Nevertheless, it is clear that a monitoring and incentive mechanism could not be substituted by mere contracts. In this sense, the model is very rough.

Model 3: The modern stakeholder view of organisations

Speckbacher (2003) pointed out that the problem of managing specific investments need to be considered by the organisation, because of the typical incompletion feature of the contractual relationships in a company. From the view of this model, an incomplete contract only specifies the initial wage and working conditions and some rough objectives but does not state how much efforts employees should do. Therefore, it is impossible for workers to expect that the firm will encourage their spontaneous efforts with increased wage or promotion in order to make them realize personal goals and value. In this model, the contract cannot guarantee that all parties involved (who are referred to as stakeholders) will devote enough efforts required by the organisational goal. Thus, balancing the interests of all stakeholders and stimulating them to greater efforts in line with the organisational objective is the key issue of a modern stakeholder-oriented strategic performance measurement system. From this sense, the incomplete contract view of the company could be seen as one of the theoretical bases of the contemporary performance management system (Atkinson, Waterhouse and Wells, 1997).

Although these three economic models are too abstract for practice, the economic concepts which contain in these models are useful for understanding performance management.

Paauwe and Richardson (1997) developed a complex performance management model based on synthesising the prior studies. They emphasise that organisational performance can be affected by selected human resource management activities. In 2004, an updated conceptual model of performance management was depicted by Paauwe and his colleagues (Paauwe, 2009) (see Figure 3-16). The model describes the human resource management practices related to performance management have impacts on employees' perceptions and attitudes. Individual performance is believed to be affected by employees' perceptions and attitudes, which in turn affects organisational performance. The model points out that the front-line managers play a key intermediary role in carrying out these practices and proposes the causality in human resource management and performance relations (den Hartog, Boselie and Paauwe, 2004).

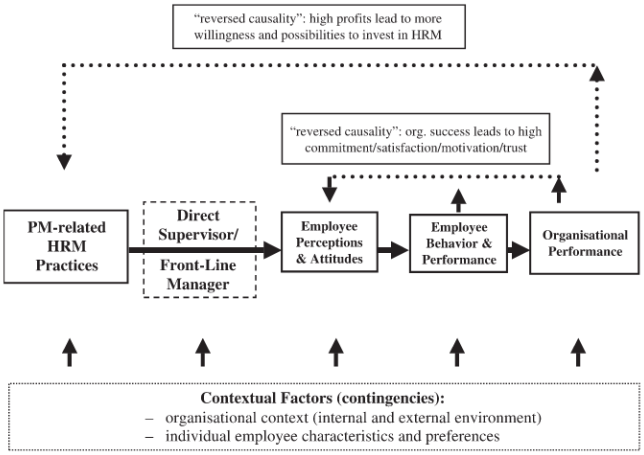


Figure 3-17 The relationship of human resource management and performance from a performance management perspective (adapted from Paauwe, 2009)

Demartini (2014) proposed a performance management model by adopting a loose coupling approach (Weick, 1976). The author argues that, while some performance management frameworks adopt a holistic perspective, they hardly take into account the different mechanisms and their interactions in the corresponding performance management system based on a systemic view. He believes that the coordination, autonomy and flexibility features of the system loose coupling approach can be used to solve the above issue and could provide a higher degree innovative capability for the performance management framework (Bisbe and Otley, 2004).

The loose coupling performance management model contains six main interactive mechanisms. It has an octahedron structure with six vertexes and eight faces (Figure, 3-18). The octahedron can be seen as a combination of two pyramids, which are united through their bases. A comprehensive performance system grounds on loosely (tightly) interactions of six mechanisms through this octahedron structure. In this model, four mechanisms, namely, strategy formulation, strategy implementation, performance measurement, and the reward and incentive mechanism, constitute the centre of the performance system. Another two mechanisms, i.e. value sharing, strategy execution, represent different levels of management interventions. The value-sharing mechanism is on the top of the octahedron structure, while the strategy execution mechanism is at the bottom. The value-sharing mechanism represents the related effects of cultural and value in a performance system. In contrast, the structure

strategy execution mechanism refers to the implementation of strategy and corresponding controls and operations processes (Demartini, 2014).

The author indicates that, by collectively considering the six mechanisms in the octahedron model with more coherent, effective, people could develop more efficient and effective performance management systems. Adopting the concept of loose Coupling into a performance management system is based on the assumption that the flexibility of the components of a system could perform better and gain a higher capability to survive under a changing situation (Lutz, 1982).

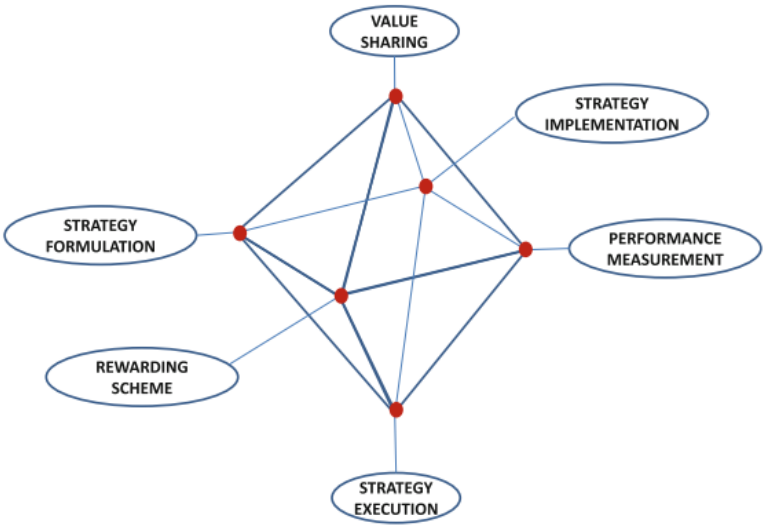


Figure 3-18 The loose coupling performance management framework

Schleicher *et al.* (2018) developed a system-based conceptual performance management model with two aims. One is to provide a taxonomy for the variety of existing performance management approaches both in research and practice. Another is to provide a conceptual framework for integrating all the performance management studies to attain a better understand the effectiveness of performance management and leading the future studies. This model indicates that a holonomic performance management system is made up of three key components, namely, input component, output component and process components (see Figure 3-19). The model further specifies the process component with for interactive factors, 1) performance management tasks, 2) people in the performance management, 3) formal performance management processes, 4) informal performance management processes. The authors argue that the above four performance process factors combining with input and output form a taxonomy for performance management systems in the most general level. Moreover,

the authors believe areas for future performance management studies could be identified through the review of recent performance management researches according to the above six model components (Schleicher *et al.* 2018).

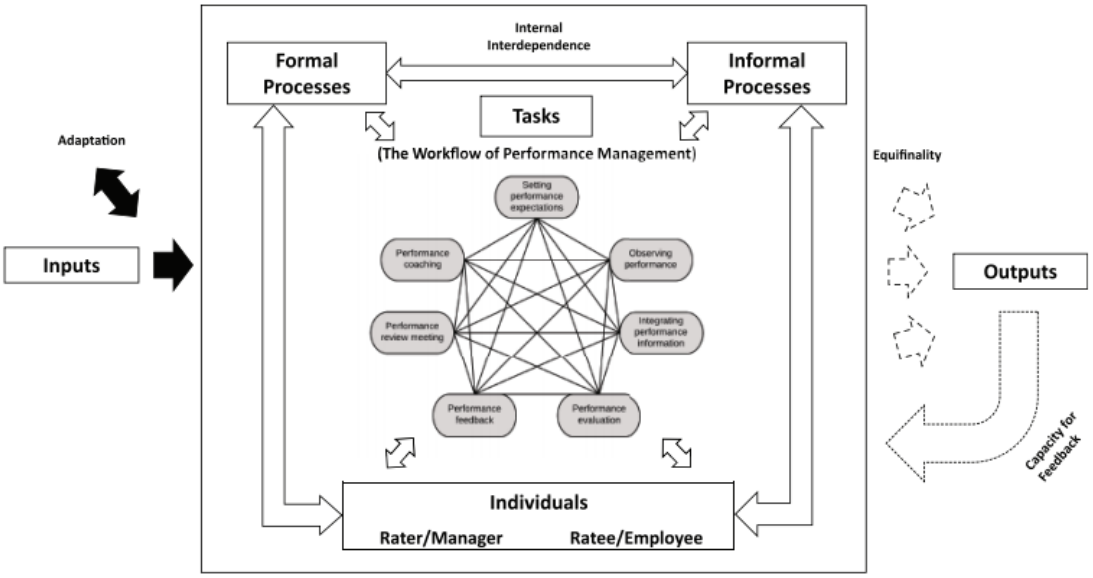


Figure 3-19 A system-based performance management framework (adapted from Schleicher *et al.* 2018)

Based on the above review of performance management frameworks, it is clear that lots of contents of performance management, such as strategy decomposition approach in the BSC model, the standardisation approach in the BEMs, are related to coordination (Mintzberg, 1992) in a global level. This finding will be elaborated in details later. For that purpose, the theory and approaches of coordination in management are reviewed below.

3.3 Literature review of coordination theory and approaches

In performance management, coordination is an important force often used to bind all the other functions of management in an organisation and, provides the orderly arrangement of aligned actions in the pursuit the organisational objectives (Olsen *et al.*, 2007). Omoregie (2013) believed that when proper coordination mechanism is applied in an organisation, efficient and effective performance can be achieved. Nowadays, organisations and their performance

outcomes are more characterised by complexities, and this is imposing more importance of coordination in performance management. Thus, the literature of coordination theory in management is reviewed.

3.3.1 The definition of coordination

The concept of coordination has been developed in various fields, especially in organisation management, to provide the unification, integration, synchronisation of the efforts of different components or functions by reconciling between means and ends, so as to provide unity of action to achieve common goals. From the perspective of coordination, the organisational concepts are the extension of the existing coordination terms and theories (Boella and van der Torre, 2006). Thus, in the organisation studies, the coordination theory forms a part of the classical approach to organisation theory (Wilkinson and Dale, 1999).

Dessler (1986) defined coordination as an essential process to create synergies among independent activities, which should be first considered by managers where departments aim to achieve common goals. Similarly, Malone and Crowston (1994) defined coordination as being the "process of managing dependencies among activities".

Although the classic definition of coordination is mostly based on managing activities, some scholar argues that coordination should be understood from a more holistic perspective. Viinamäki (2004) proposed that coordination is the interrelation of functions, structures, and resources in an organisation, which carries out at different levels or possess different dimensions. While Beuselinck, Verhoest and Bouckaert (2007) argued that the co-ordinational instrument is based on its underlying coordination mechanisms. Therefore, people need to explore these mechanisms for obtaining a profound knowledge of the concept of coordination.

3.3.2 Forms of interdependence

Interdependence is the precondition for the coordination. Otherwise, a status of coordination will not happen, if each element is isolated from each other. Moreover, different forms of interdependence can affect the generation of coordination (Alexander, 1995). Thus, the various forms of interdependence are briefly reviewed in this section.

The interdependence is the dependence of two or more elements (e.g. people or things) on each other, which is very different in nature. There are three commonly cited types in literature. The

first type of interdependence is pooled interdependence, in which each element of system performs completely separate functions, separately makes a contribution to the whole system and has no interaction with other elements (Thompson, 2003). In this form of interdependence, each element is directly supported by the whole system, and any change of one element may significantly affect the entire system in turn.

The second type of interdependence is sequential interdependence, in which the output, such as information, materials, products, or resources, generated by one element is a necessity for another element as inputs (Thompson, 2003). The coordination of an assembly line in manufacture may be the most obvious example for it. The sequential interdependence is mostly process-based. The change of the preceding element in a process will directly affect the latter one, yet this not necessarily lead to a discernible impact for the whole system.

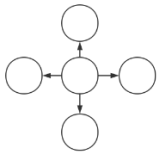
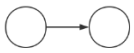
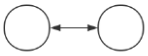
The third type of interdependence is reciprocal interdependence, in which the activities of two elements flow both ways (Frayret, D'Amours and Montreuil, 2004). From an input-output perspective, the output of one element serves as the input for a second element, and the output of the second element serves as the input for the first unit. This type of interdependence is realistic and cyclical, which means all the elements need to communicate and interface closely with each other.

Daft, Murphy and Willmott (2010) argued that interdependence often varies between low level and high level in the organisational environment depending on the degree of the interaction among different departments. Low interdependence refers to the departments can do their work independently in the case of few interactions, communications or reciprocity of materials between each other. High interdependence refers to the departments to continuously exchange resources and outcomes. Accordingly, he categorizes the three type of interdependence into low, medium and high interdependence respectively.

3.3.3 The connection between interdependence and coordination

Daft, Murphy and Willmott (2010) discussed the type of coordination methods that are required in three types of interdependence (see Table 3-2).

Table 3-2 The types of interdependence and corresponding coordination (adapted from Daft, Murphy and Willmott 2010)

Form of interdependence	Communication level	Type of coordination mechanism required
Pooled interdependence 	Low communication	Standardization, Regulations, rules, Convention, Procedures.
Sequential interdependence 	Medium communication	Plan, Schedules, Feedback.
Reciprocal interdependence 	High communication	Mutual adjustment, Relational coordination, Knowledge learning, Teamwork.

In the form of pooled interdependence, each unit in the organisation works independently. However, these units may share finance resources from a common pool. The coordination mechanisms associated with pooled interdependence are quite simple. Rules and procedures are often used to standardize activities across units. There is very little daily coordination required among units.

In the form of sequential interdependence, the preceding unit must perform properly for the latter unit to perform correctly. The coordination requirements for sequential interdependence are more demanding than those for pooled interdependence. Since all the units are in a one-way working flow, extensive planning and scheduling are generally needed. Some day-to-day communication among the units is also needed to handle unexpected problems and exceptions that arise in the working flow.

In the form of reciprocal interdependence, the relationship among all the units is cooperative and mutually beneficial partnerships. The outputs of units influence each other in a reciprocal way. Therefore, close coordination is required, which the units work can together as a team

and communicating intimately and frequently is allowed. Coordination by preplanning will not anticipate or solve all problems, and units have to be involved in face-to-face coordination, information sharing, instant decision making and plan adjustment (Daft, Murphy and Willmott, 2010).

3.3.4 Coordination methods

The coordination of performance management in practice embodies in many types of coordination mechanisms and approaches, which represents the complexity of the activities and processes in an organisation. By reviewing the existing literature of coordination definitions, it shows that the coordination methods in practice are not only about activities coordinating mechanisms but also accompanying continuous processes that enable all the interdependent elements to work together effectively (Deng, Chen and Pan, 2008). Therefore, this study carries out a review of coordination methods from the view of the different stages in a continuous process. Mostly, a continuous process can be divided into three essential stages, aforehand stage, operation stage, and outcome feeding backstage. Whereas considering the convenience of the management in practice, the second stage and third stage are integrated into one stage, named the implementation stage, because they both belong to the process of implementation in a sense.

Coordination methods in aforehand stage

In this stage, the selection of the coordination method is based on the predefined objectives and the analysis of the external environment and internal conditions (Skipper *et al.*, 2008). Thus, the most used coordination method is coordination by plan (see Figure 3-20), which involves the establishment of predefined plans to coordinate a priori interdependent activities (March and Simon, 1958).

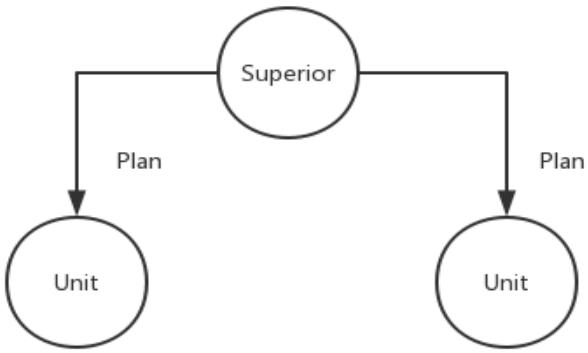


Figure 3-20 Coordination by plan

There exist many different planning methods for coordination. One is strategic planning, which aims to ensure all the elements all working towards a common objective, management and resources are all aligned with this plan. According to the overall goal and its decomposed objectives in an organisation, a strategic plan often lays out, how these objectives will be achieved and, how the success of the strategy will finally be measured.

The second type is tactical planning, which builds on the strategic plan already set out, by breaking the overall plan down into short-term plans and corresponding actions and processes. Tactical planning normally has an extra level of details than strategic planning.

The third type is action/operation planning, which is far more focused on detailed activities and processes, mostly for increasing the level of efficiency and effectiveness.

In general, coordination in this stage more commonly occurs through preplanning, such as goal selection, task decomposition, regulation, routines, scheduling, common knowledge and skill, etc. They enable the system to achieve coordination while minimizing interaction among elements (Tushman and Nadler, 1978). Therefore, the effectiveness of coordination method in this stage very much relies on the extent to which the system's situation is stable and predictable, which means they will be most effective in setting with the highly stable situation and low level of uncertainty.

Coordination methods in the implementation stage

In this stage, although coordination by plan still plays a preliminary role, more attention is need be given to the coordination methods that cop with a variable and unpredictable situation during the whole operation process. Moreover, the coordination methods used in the implementation stage, often are differentiated in the levels from local to global (Danese, Romano and Vinelli, 2004).

In the local level, coordination by direct supervision is the most common method. Mintzberg (1980) extended the coordination by a plan to the operation stage. He named the particular coordination method as coordination by direct supervision (see Figure 3-21), in which supervisors are responsible for the work of their subordinates, and consequently for coordinating them by defining a formal or informal plan according to which they should act (Mintzberg, 1980).

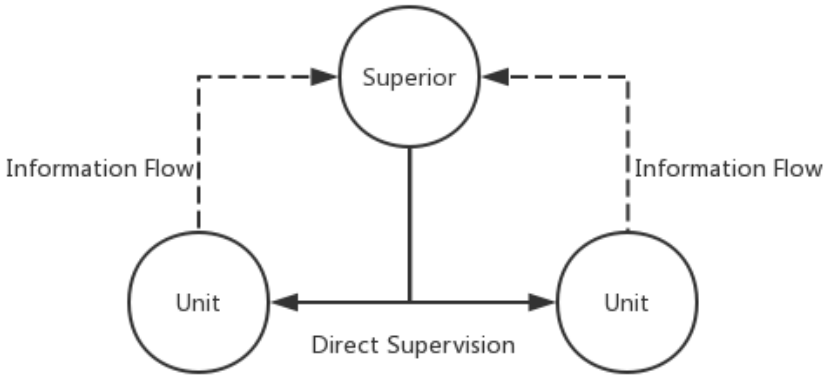


Figure 3-21 Coordination by direct supervision

In the intermediate level, coordination by feedback (see Figure 3-22) and mutual adjustment (see Figure 3-23) are often be used. March and Simon (1958) propose that coordination by feedback is a fundamental coordination method during the different and complex operation period, which involves the exchange of new information in order to coordinate interdependent activities (March and Simon, 1958).

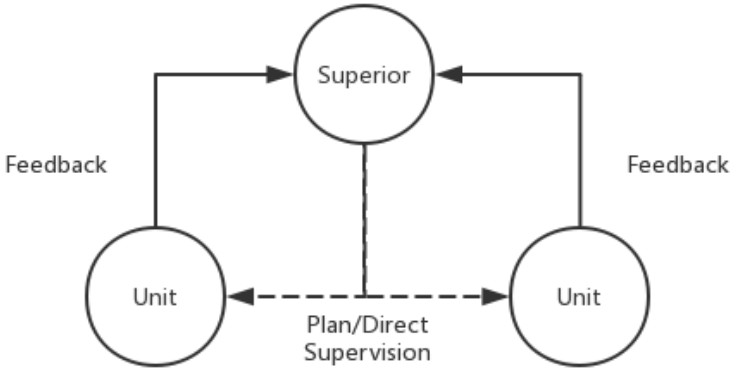


Figure 3-22 Coordination by feedback

Thompson (2003) argues that coordination by a mutual adjustment is an effective coordination method, which highlights the two-way linkages between superior/subordinate elements rather than the one-way feedback. (Thompson, 2003).In the meantime, he believes mutual adjustment is restricted in practice because of its prohibitive management cost.

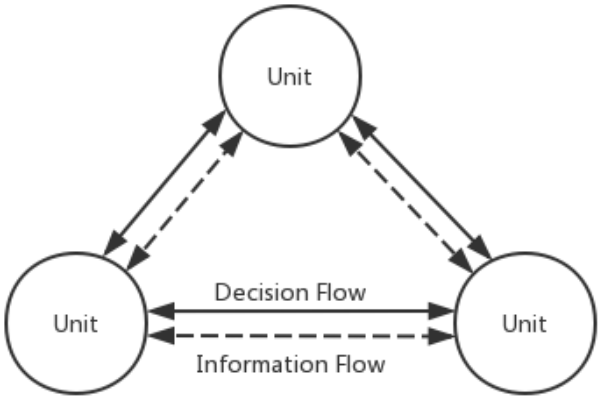


Figure 3-23 Coordination by mutual adjustment

In the global level, coordination more commonly occurs through standardization, as it has a relatively lower cost than mutual adjustment. Standardization often involves the establishment of routines, rules, quality level requirements, or design features in order to constrain the actions or the output results of a system (Thompson, 2003). These methods of coordination by standardization (see Figure 3-24) enable the organisation to achieve coordination while

reducing the cost of interaction among elements (Tushman and Nadler, 1978). Mintzberg (1980) identified three subcategories of coordination by standardization, standardization of input skills, standardization of work processes, and standardization of output (Mintzberg, 1980).

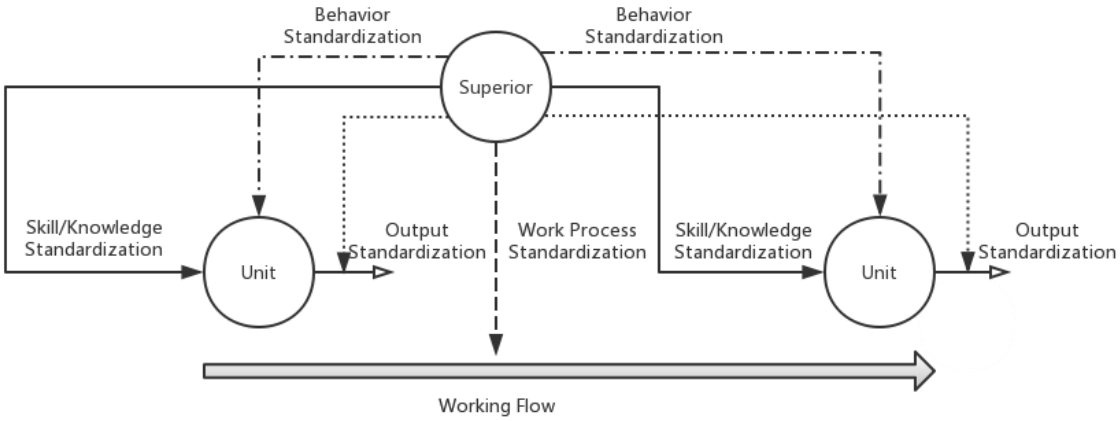


Figure 3-24 Coordination by standardisation

However, the coordination by standardization cannot well handle the project with uncertainty and time constraints. The complexities of the real problem and actual situation often beyond what standardization has foreseen. These require all elements to coordinate effectively to refine the work objectives and processes in which they are engaged by timely, real-time and deep communication. Gittell (2006) proposed a new concept of coordination, relational coordination, which refers to on the basis of common aims, shared value, mutual respect, different units build synergic and reciprocity relationships and, regular, timely, effective and substantial communications among these units can be achieved. He argued that this type of coordination goes beyond mutual adjustment as a simple mechanism, but rather includes the fundamental value and culture of a social system. In relational coordination, it is believed that the key methods are frequently, timely and problem-solving communicating, establishing a relationship with shared goals and shared knowledge, cultivating a culture of mutual respect. By this type of coordination, all the elements share information freely across boundaries, and they interact on a continuous basis to share knowledge and solve problems. Relational coordination relies on sustainable positive relationships rather than a traditional explicit coordination mechanism. In that context, relational coordination occurs even when element autonomously communicating with each other (Gittell, 2006).

3.4 Summary

In sum, performance management has been successfully used to help various organisations realise their objectives and fulfil their strategies. A large number of performance management frameworks have been developed with diversified purposes based on different disciplines to facilitate performance management. For example, some are for the implementation of organisational strategies (Bititci *et al.*, 2015), some are for providing alignment within, and between organisations both in departmental and functional level (Liang, 2015; Maestrini *et al.*, 2017), some are for optimising resource allocation and support decision-making (Liang, 2015), and others are for enhancing either individual or organisational performance (Franco-Santos, Lucianetti and Bourne, 2012b; Neely, 2005). It is noteworthy that, relatively recently, people start developing more multidisciplinary performance management frameworks from converging these disparate disciplines as they recognise the need for integration (O'reilly, 2009). In spite of this, the traditional discipline-oriented performance management frameworks still dominate the application in practice.

While performance management theories and approaches have been developed and improved significantly over the years, managing performance effectively, flexibly, sustainably or dynamically remains a critical and common challenge on organisation management (Cappelli and Tavis, 2016; Micheli and Mura, 2017). Specifically, in the field of performance management frameworks development, various scholars and practitioners have raised questions whether the existing popular and successful frameworks, such as the BSC model and EFQM excellence model, can cope with the developmental demands of organisations in the increasingly volatile and uncertain business environment (Bourne *et al.*, 2018), as this study mentioned in the review.

Most performance management frameworks can be regarded as an aggregation of interactive actions and processes that aim to achieve some of the key causal elements of the organisational objectives through a certain management logic (Bourne, Melnyk and Bititci, 2018; Zheng *et al.*, 2019). This problem is related to the imperfection of the performance definitions that this study discussed in the last Chapter. This action-oriented and simplify method is appropriate when the objective and strategy can be clearly defined, and the corresponding actions and processes can be exactly predicted. However, the current reality shows that most organisations can hardly meet such an idealized situation. In the literature review, some newly developed

performance management frameworks based on the systemic perspective and put more elements that are not directly linking to the actions and processes into the framework (Bianchi, Bovaird and Loeffler, 2017; Jayakrishnan, Bin Mohamad and Yusof, 2018). However, most of them are not easy to apply in management practice but could provide benefits for the conceptual development of performance management. Further, there are no acknowledged frameworks that able to fully cover most of the issues in nowadays performance management (Pulakos, Mueller-Hanson and Arad, 2019). In this sense, it can be argued that organisations need a new way of observing and understanding performance and performance management that can be applied to deal with the current complicated and highly uncertain business context, which is recognised as demands both in research and practice.

At the end of this chapter, the coordination mechanism and approaches are reviewed because this study finds that they are closely related to performance management practice. This study argues that this could be in the direction of future research. In fact, global coordination is believed containing a large part of the unique contents of performance management.

Chapter 4 Redefine Performance and Performance Management

The traditional performance definitions raise the limitation of the performance management in different practice area as most of them are action-based. Meanwhile, the stagnation of the development of fundamental theory in the field of performance management makes these issues persist. Academics and practitioners have developed various performance management frameworks from different perspectives. Most of the popular ones are simple and easy to be understood for implementation, yet it also leads to the limitation in the application, especially in the new business era. To help mitigate the above issues, the primary task is to clarify the essence of the performance and performance management, which might shed light on further performance management research and application, particularly on the performance management framework. In this chapter, unified definitions for performance and performance management are inductively developed, then a performance management framework is proposed.

4.1 Redefine the performance

Through the literature review, this study argues that performance actually consists of more contents than just action, results and impacts. However, there is no possibility for people to list them all.

Moreover, the performance definitions generally fall into two categories form the results and action perspective. The first category defines the performance as either obtained results or partial actions, such as outcomes, achievement, actions, behaviour, capabilities (Murphy, 1988; Campbell, 1990; Dwight, 1999; Faulk II, 2002; Lebas and Euske, 2004; Neely, 2004). In contrast, the second category defines the performance with both aspects, which is more prevalent (Brumback, 1988; Mwita, 2000; de Waal, 2003; Hall, 2003; Burns and Baldvinsdottir, 2005; Liu,2010; Qi, 2010; Zhen,2017).

Like the issues in the contents aspect, this study finds that there are other relationships rather than only results and actions existing in the performance in the management context. For example, the relationship between stakeholder and results (Stainer and Stainer, 1998), business environment and results (Chi, Kilduff and Gargeya, 2009), state policy and results (Wang and Kafouros, 2009), employee well-being and results (Nielsen *et al.*, 2017), etc. In these relationships, all the formers possibly have their effects on the results.

After extensive literature view, discussion with experts, this study proposes that the causality can be used to summarise these relationships. In the study of cognition, there are various causalities (Marini and Singer, 1988), which are not fixed, depending on a different context, such as belief.

In most practice, the existing of causality in performance also can be apperceived in a business and management context. Very often, business and management not only wish to improve the desired outcomes but also need to enhance some of the factor and mechanisms leading to the desirable outcomes (Gunaratne and Du Plessis, 2007). Clarifying why and how desirable results are produced or obtained can help people enhance their knowledge and practice for improving performance in management. In fact, promoting the outcomes by enhancing some of the causes, which is considered to be one of the ultimate aims of business management (Armstrong and Baron, 2005).

Hence, the concept of causality will be introduced for redefining performance in management. Preliminarily, this study proposes that performance is selected desirable outcomes and their causes.

In practice, people normally can only understand (limited) some of the causes. Thus, on the level of theory (or cognition), performance can be considered a set with selected outcomes and their causes which connected to them by perceivable causal mechanisms. However, before proceeding further, what causality suits for the new definition of performance need to be clarified first.

Causality

The organisational world with management is constantly in a state of flux of developing events or elements. These events and elements often involve people, materials, money, environment, ability, motivation, technology, power, social structures, ideas, etc. Hence, to observe, understand, interpret and utilise these events, elements, and their interactive processes, are primary aims of management study (Thomas, 2006). Through a long term research practice on

obtaining and utilising the above knowledge, people often believe that all the events and elements are not simply happening by chance, which leads to the belief that the functions of organisation management world work by some types of causality/cause-and-effect relationship (Klein, 1976).

However, the questions what the causality are can only be answered clearly at philosophic level. In the research on the universal connection between various things, there are many scholars who do agree there exist causal relations. However, there are several, largely exclusive, conceptualisations of causality (Watkins, 2004; Groff, 2008).

The concepts of causality respectively proposed by Hume and Kant are two considerable important milestones in the development of philosophy. Hume believes that causation is one of the seven different kinds of philosophical relation, while the else are resemblance, identity, spatiotemporal relations, a proportion in quantity or number, degrees of quality, and contrariety. (Hume, 1985), while Kant also thinks cause and effect is one of the twelve basic concepts in his transcendental idealism, while the else are Unity, Plurality, Totality, Reality, Negation, Limitation, Inherence and Subsistence, Community, Possibility, Existence, and Necessity (Kant and Wood, 1999). Nonetheless, Kant deems that the causal relationship must be a necessity, while Hume allows that to be constant conjunction instead of necessary connexion. Hume does not mean negating the existence of causal relations. Instead, he insists that causality cannot be proved implying necessity by an empirical method.

Besides, CR has its own elaboration on causality. CR argues that the method necessity of causal relationship was observed, proved and generated by empirical observation of events with large and quantitative data sets, perceives numerical relationships about the social world in a ‘closed’ way, disregards the independent role(s) of broader context(s), which social phenomena cannot be arbitrarily separated from (Groff, 2009). Critical realists believe that an explanation of causal relation is related cannot be elicited through a deductive, positivist approach, because the social world is an open system, and will be affected by a complex array of influences which change both temporally and geographically, often in unexpected ways. Thus, a specific causal relationship and its need to specify under what conditions this might be the case, as a number of contextual factors (Edwards, O’Mahoney and Vincent, 2014). In this sense, CR is of the view that any outcome has its causes and they are connected through its causal mechanisms, which, in an open system (like a social system or any system containing people), are understood as tendency causing that outcome (Mingers and Standing, 2017).

Casualty in CR

As this study has adopted the CR paradigm that has been discussed in Chapter One, the causality in CR is adopted to guide the conceptual development of performance in the following research procedures. Thus, despite a brief introduction of CR in Chapter one, it is necessary to discuss what is the causality in the CR paradigm in more detail.

CR proposes a three-level model of the reality: real, actual and empirical. In terms of the human world, the real world in CR exits independent from human perceptions, people yet often devote themselves to recognise and understand it through various methods; the actual world is human's cognitive reflection and theorisation of the real world; the empirical world is the very limited part of the real world that can be experienced by human beings. The causality in CR implies in the stratified or depth ontology that the world is structured, differentiated, stratified and changing (Edwards, O'Mahoney and Vincent, 2014). Different from the causality of Hume and Kant, it is a mechanism and structure-based (Lee, 2012). It emphasises the generative process in causality that provides more explanatory power to help people understand an event than other Hume and Kant's causality (Njihia, 2011).

Specifically, CR believes that the real world constitutes the mechanisms and structures. The interactions of mechanisms and structures have the causal power to generate events (either occur or not occur) that could be observed and learned in the empirical world. CR also believe there is an intermediate layer of the world, namely actual domain, which links the real world with the empirical world mostly by people's cognition (Bygstad, Munkvold and Volkoff, 2016). In common language, this study calls this domain as theory world.

The form of causality in CR is often called "generative causality" (Mingers, 2012), because the results people observed have a generation process throughout the three CR worlds. More precisely, different from Hume and Kant's theory, the causality in CR is that the events people have observed and experienced are generated via the complex interactions of certain mechanisms (have causal powers or tendencies) in the real world (Mingers, 2015). The causality in CR emphasis not only the relationship of causes and effects (point to point), but also the generation processes of a causal event (connections). The strength of this "mechanisms" view of causality integrates the philosophy of science, critical realism and systems thinking, and brings insight into the real causation. By comparison, the traditional hypothetico-deductive model only can bring the explanation as it is only the deduction of consequences from general laws (Mingers and Standing, 2017).

In other words, grounding on CR paradigm, an event in the actual domain is caused by unfathomable mechanisms and structures in the real domain. Then, in the empirical domain, a certain fact that people experienced is linked with infinite events as the integration of the real world and human social system indubitably is an open system (Wynn and Williams, 2012).

If people believe that all the events happen within the real world not by chance but for some known or unknown reasons, then they will try to give an explanation on why these events occur through other related events. When some events cause or influence other ones, people often call these some events as causes (in general) and call their relationship as cause-and-effect relationship/causation (Mouton, 1994). Furthermore, people also try to interpret how one event cause or influence another event, which means to open the black box of causal-and-effect relationship (Imai *et al.*, 2011). The process of how one event leads to another event often be called causal mechanism. It is noteworthy that the causal mechanism should be distinguished from the mechanism with generative causality, one reason is that the former exists in the actual and empirical domains and it is cognised and can be experienced by people. In contrast, the latter exists in the inaccessible real domain that needs people to attempt it. It should also be pointed out, the causal mechanism may be non-material, such as social structures, knowledge, technology, thoughts, motivations, religion, etc. Just as Mingers and Standing (2017) argued, in fact, CR believes that almost everything is believed having causal effects in the CR world. Figure 4-1 shows the generative causality in CR.

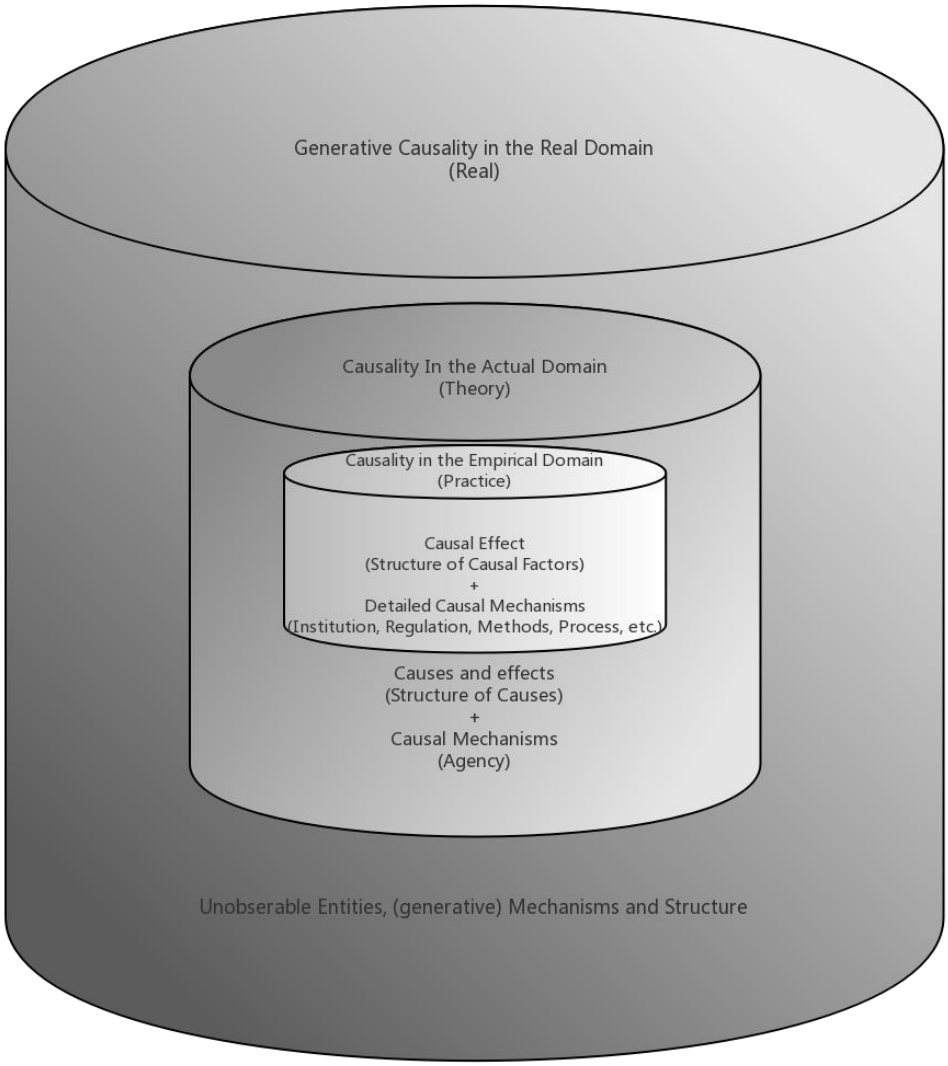


Figure 4-1 Generative causality in CR

Based on the above understanding about causality in CR, this study argues that the generative mechanisms of an outcome in the real domain are inevitable yet cannot be ascertained completely. Therefore, in the level of actual and empirical, the causes and causal mechanisms identified by cognition or experience certainly are limited. This ontology character is one of the reasons that the causal-effect people identified would not be a necessity in CR. Another reason is that people cannot exhaust all the causes and causal mechanisms as the human world is an open system, which leads the uncertainty to the discovered causality. Hence, the proposed causality can only be understood as a tendency causing a certain outcome in an open system due to the limitation of people's cognitive abilities (Mingers and Standing, 2017). From a

management control perspective, it is because of the uncertainty that organisations need business management in the real world (Silaen and Williams, 2009; Spender, 2015).

For instance, in the assembly department of a car manufacturer, people may empirically observe the efficiency of assembling is achieved by a team of workers in an assembly line who rigorously follows the standard operating procedures. To understand this outcome of the performance, people may need to look beyond the events observed. The existence of the team and the reasons the workers comply with following the rules is unlikely to provide a much complete explanation of the causal mechanism that produced the assembly efficiency. Without recognising that the other factors may play a role in causing the efficiency generated, people are likely to achieve "level-abstracted view of it" (Elder-Vass, 2010, p49), namely a view that considers the effect of the team in isolation. These type of factors could be the existence of the inter-team relationship, the activities of process designers in constructing the operational procedure, the professional pre-service training, random surveillance from superiors, and even national education systems, etc. Therefore, people might need to turn into the theory level. The causes of the team's efficiency may be accessed beyond the immediate context of the observed compliance. Consequently, performance, in reality, is much more complex than may be apparent in simple observations. Furthermore, some of the actual causes of performance may not be observed cognitively or economically. It is also possible that there exist other potential causal mechanisms that may be in part or whole not observable but still have an effect.

In addition, it needs to notice that there must be multiple causes people can tease out from multidimensional explorations, and usually no single (causal) mechanism can determine the whole result (Bhaskar, 1978). The real world is indeed complex and borderless. It is difficult and often fallible for people in trying to understand and explain it by going after the underlying generative causality. In spite of this, CR already indicates that the real is an inevitable exist. The suffering of the cognitive process does not mean that people should not attempt it.

In short, the causality in CR is believed to be suitable for this study because of two main reasons.

(1) The causality in CR theory is not simply the causal relations among events but the mechanisms and structure of the causal powers throughout the three-level world, which eventually generate an event (Sayer, 2012; Mingers and Standing, 2017). Therefore, adopting CR's causality could help this study intensively investigate performance and performance management.

(2) The causality in CR theory is closely related to the tendency, which in short is potentiality. Hence, CR's causality does not imply actual and future necessity because no one can know all relevant facts and mechanisms (Fleetwood, 2011). Therefore, CR's causality perhaps is the truest theory in terms of the social world as an open system. In this sense, the significance of the causality to management is that its mechanism and structure nature provides more possibilities for achieving results for managers.

New performance Definition

By adopting the causality in CR, this study defines that ***performance is selected desirable outcomes and their causes that are projected on causal factors and causal mechanisms***. Here, the causal factors and causal mechanisms are the agents of the generative mechanism in the theoretic and empirical level. The reason for introducing them into the definition is because they are perceivable and manageable facts in reality, yet the generative mechanism is not (Mingers and Standing, 2017).

The causal factors often include resources such as human and materials, stakeholders, regulations, environments, culture/strategic choices, information (Coff, 1999; Irani, Beskese and Love, 2004; Hompes *et al.*, 2017), etc.

The causal mechanisms are often planned actions and processes, or a variety of applied management theory, logics, methods, approaches and processes, such as scientific management theory (Ferraro, 2016), motivation theory (Bassett-Jones and Lloyd, 2005), BSC model and strategy map (Kaplan and Norton, 1996), business process management (Jeston and Nelis, 2008), etc.

Introducing cause and mechanism into the concept of performance is just because organisations not only wish to enhance the outcomes but also need to promote desirable causes leading to the outcomes. Simultaneously clarifying the outcomes and causes of performance can help people enhance their knowledge of it.

In addition, this is a meta-theoretical definition, which is given the expectation that it could synthesise science and social science for guiding the empirical investigations in performance management.

The new definition of performance includes both abstract and specific meanings. For an abstract performance, the generative mechanism to achieve it is also abstractive, which contains boundless causal factors and causal mechanisms that could possibly link to the performance outcomes. For example, to increase financial outcome, firms can adopt different

methods, that is, generating mechanisms to achieve it in theory, such as expanding the market, reducing costs, government subsidies, improving asset utilisation, etc. Nevertheless, for a specific realised performance outcome, its generative process is completed, and the corresponding causal factors and causal mechanisms are established. Take the above financial outcome as an example, when a firm realises the desired financial performance, the generative mechanism of the performance is then fixed in a certain context, e.g. mainly expands the market and reduces costs. It should be noted that identifying the historical generative mechanism of the performance in an organisation could provide important inspiration for its future performance management.

The abstract and specific meaning of new performance definition has a significant benefit for both performance management research and practice. The generation mechanism of specific performance is the cornerstone for performance re-creation and improvement and, provides important management references for the future. The meaning of abstract performance provides a theoretical basis and directional guidance for improving performance management.

The new performance definition provides an insight into why there are various performance definitions in different disciplines (Armstrong and Baron, 2005). In theory, the performance at the abstract level could be certain events that occur in space-time, which may be different from what people perceive in practical. From the perspective of the open system (Padaki, 2002), people normally can only restrictedly understand performance, especially on its causal factors and causal mechanisms, due to the restriction of time, space, expenses, and mostly human cognitive abilities. As a matter of fact, people try to understand and study performance from different perspectives, levels or focuses (Armstrong and Baron, 2005), which is based on different cognition level or different understanding of causality. Thus, that is why there are many different definitions of performance at a cognitive level, as summarized in previous sections. However, it is arguable that they should be a special example of this new definition of performance.

In addition, the structure-based causality in the new performance definition makes researchers and practitioners possible to gain a more depth understanding of performance for further management by studying its generation process according to the possible structure of causal factors and causal mechanisms (McAvoy and Butler, 2018). (In theory, a cause may have its causes and subsequently may have infinite causes with higher resolutions. Howbeit people are often able to understand causes at a certain level, which is limited by human's cogitation capacity, practical capability or subjective will. In practice, people do not include any causes

found in empirical evidence. They have to form a causal relationship with the outcomes in the specific circumstance. There must be causal mechanisms behind them, and they can repeatedly (in greater changes) to cause the outcomes under certain conditions. It should be noted that in this domain, results are abstract, and so are the causes, and leads to an abstract causality.) Moreover, there are often multi-layer sub causal factors for a result (a selected desirable outcome), and each of the sub causal factors may have their own layers of causal factors and corresponding causal mechanisms. According to this idea, the performance, in theory, can be seen as a multi-layer causality network constructed with different layers of causal factors and causal mechanisms, where the causal factors are nodes, and causal mechanisms are the logic links. Although it is hard for people to identify all the causal factors and causal mechanisms for certain performance outcomes, the theory viewpoint of performance's causality network might provide a feasible way for opening the black box of performance and the application of the new performance definition.

In management practice, people are only able to or prefer to manage and enhance some of the causal factors and causal mechanisms in the causality networks, such as those inside their control or organisations (Clegg *et al.*, 2019). For instance, as an international university, the government's visa policy is a cause of the university's student enrolment performance. The restrictive change of visa policy may lead to a decline in the student enrolment scale. However, the government's behaviour cannot be controlled by the university. Similarly, in terms of business management, performance may be further constrained by realities such as department boundaries, etc. In practice, many effects of the causality can often be exerted by certain (key) causal mechanisms. In addition, the management resolution of an organisation binds managing or enhancing all the causes of key performance. For example, the school will not control how to give a lecturer in detail, although teaching qualification should be an important output of the school's performance. Thus, considering the business management reality and the pursuit of effectiveness, the performance might be seen as the selected outcomes of desirable objectives which are achieved through essential and controllable causal factors and key causal mechanisms. The above discussion indicates that this study might need to carry out further studies on the structure of performance.

Significance of the new performance definition

In the existing research, attempts made to clarify the concept of performance by definition have not led to all acceptable results (Otley, 1999; Elena-Iuliana and Maria 2016). The vast majority

of existing performance definitions are simplifications of complex performance ontology or simply a factual listing of partial causal factors.

From the literature review, it is found that most scholars define performance by the identification of its characteristics or its components that implicit the underlying idea of simplification. This kind of definition is given in reference to its constituent parts or its characteristics (Van de Ven, 2007). The definitions of performance are approached in the literature using different sets of dimensions or variables. By this method, the traditional performance definitions cannot realise the uniformity of the conceptual level and the operational level (Van de Ven, 2007; Cameron and Whetten, 1983; Quinn and Rohrbaugh, 1983; Aubry and Hobbs, 2011). The other issue with the traditional performance definitions is that they inherently have subjective characteristics. Many of them have obvious discipline characteristics. It can be difficult to reconcile the multiplicity of points of view of performance on account of different cognition ability level and varied management requires. Moreover, most of the traditional definitions of performance hardly involve the logic relationship of the listed elements in their definitions, nor the different management conditions/context.

All the above issues of the traditional performance definitions lead to the limitation in responding to the innovation and development of management approach with the times. Although trying to give a clear definition of performance is not an easy task, this study believes the interoperation of performance from the perspective of generative causality in CR paradigm may shed new light on alleviating the problems for both academia and industry.

In summary, this study has explicitly introduced the concept of causality, which is often represented by causal factor and causal mechanisms in reality, into the definition of performance and organisational performance. Depending on what level of cognition, the definition can be very abstract or specific, and with it, most of the existing definitions in performance management research and business practice often can be explained. In this sense, this study wishes it can unify the existing definitions of performance in the areas of management.

4.2 Redefine the organisational performance

Similar to the situation of the performance definition, reviews of the existing literature on organisational performance management indicate that there is no unified definition for the concept of organisational performance (Richard *et al.*, 2009). Some scholars define organisational performance as just outcome of the organisational processes, which can be represented by various dimensions (Stankard, 2002; Hussein *et al.*, 2014). For example, Sink and Tuttle (1989) argue that organisational performance is innovation, effectiveness, efficiency, productivity, quality, profitability, and their complex interrelations (Sink and Tuttle, 1989). In this case, a certain number of words are used almost as synonyms to the definition of organisational performance, such as efficiency, output, productivity, effectiveness, health, success, accomplishment, and organisational excellence (Aubry and Hobbs, 2011).

Others argue that organisational performance is not only outcomes but also other elements which have a relationship with the outcomes. Early studies already have implicated these perspectives. In Ford and Schellenberg's paper on assessment of the organisational performance of 1982, three different conceptual approaches to the definition of organisational performance are identified (Ford and Schellenberg, 1982). The first approach defines organisational performance as the ultimate objectives of an organisation (Etzioni, 1964), which correspond to objectives and outcomes. The second approach defines organisational performance in terms of the organisation's capabilities to secure scarce and desired resources (Yuchtman and Seashore, 1967), which points up the ability and resources. The third approach defines organisational performance basing on the behaviour of organisation participants (Steers, 1977), which emphasises the action of stakeholders. Daft (1992) combines to some extent the above views and states that organisational performance is a type of capabilities, which are essential for the organisation to achieve its strategic goals by an efficient and effective deployment of resources (Daft, 1992). This definition of organisational performance includes more elements than those of the traditional ones. Lebans and Euske's (2006) definition of organisational performance mentions that a causal model can be used to illustrate performance describing how today's actions may affect tomorrow's results, yet no further details about the causal model are enlarged in his definition (Lebas and Euske, 2002). By the literature review, it is found that the concept of organisational performance is still an open question for researchers and practitioners to work on it.

From the point of view that this study has discussed above, all the above elements /factors could be summarised into the concept of causality. However, as organisational performance is closely related to organisational management, its definition should have more details so that it can to be applied to management reality.

Based on the new definition of performance, this study proposes that ***organisational performance is selected desirable outcomes from organisational objectives and strategies, and their causal factors and causal mechanisms that can be ethnically and economically understood and managed.***

This definition of organisational performance is more comprehensive than the classical ones, which includes further latent elements (new factors and mechanisms), also may extend the scope of performance management both in researches and practice. Evidently, the main distinguishing characteristics of organisational performance is that this performance is selected by its organisation, and it starts from the top-level objectives and strategies in its organisation.

4.3 Redefine performance management

As seen in Chapter 3, this study finds that there are a variety of definitions of performance management, as the concept of performance management mostly originates in observation and experience of management practice. Some are very abstract without much concrete substance, like “performance management refers to the wide variety of activities, policies, procedures, and interventions designed to help employees to improve their performance (Smith and Goddard, 2002). Others define performance management with a set of detailed information underlying implicit internal procedures and logics. The information often involves the contents of employee training, developing teamwork, performance evaluation, management methodology and style, developing vision, enhancing employee engagement, forging multicompetence, managing incentives and rewards (Lebas, 1995). The implicate internal procedures or logics can often be summarised as a continuous management process focusing on aligning the planned performance activities with the per-set organisation's objectives and strategies, in which the main methods are assessing, and developing the performance of individuals and teams (Aguinis, Joo and Gottfredson, 2012).

In a word, each of the traditional performance management definitions has its advantages and limitations. However, neither the abstract definitions nor the modularised definitions of

performance management clarify the essence of performance management, that is how the performance is generated or enhanced by management.

Based on the new performance definition, this study proposes a new performance management definition, which could improve the limitation of traditional ones. Utilising the structure feature of the performance definition, namely the construction and management of causal factors and causal mechanisms, might provide a more global insight into performance management both in theory and practice. To do this, an abstract/broad definition of performance management is first proposed, then detailed tasks of performance management are given in the following sections.

Evidently, the aim of performance management is to achieve or enhance the outcome of desirable objective (Armstrong, 2006). Based on the new definition of performance, it is inescapably clear that the objective of performance management could be fulfilled by managing the corresponding causal factors and causal mechanisms. Thus, this study considers that ***performance management in an organisation is to develop desirable outcomes and corresponding causal factors and causal mechanisms both in line with organisational objectives and strategies, and further to achieve or enhance these outcomes by managing causal factors and causal mechanisms (by either adjusting or pursuing them).***

4.4 Analyse the new performance management in theory

Despite the above work on redefining the performance and performance management, this study still has not specified how to manage the organisational performance based on the new theory. In the following sections, the details of the performance management tasks are studied theoretically from the performance causality network perspectives in order to develop it into a performance management framework, which can be used to guide implementation of the performance management in practice.

4.4.1 Performance network

In the previous section, this study proposes a concept of performance causality network. Based on that, if people take a bottom-up perspective, some causal factors and causal mechanisms in

the causality network form a lower level of performance and gradually form the entire network in this manner, and one can say that the top outcomes (or the top-level performance) are aggregated from the lower level performance through the network. It is clear that often there are infinite causal factors and corresponding causal mechanisms with ever finer resolutions.

In performance management research and practice, the ultimate goal is to achieve or promote the desirable outcomes (Pollitt, 2018), by which naturally the method for achieving it is to develop and further manage the performance causality network. However, only cognizable, specific and achievable causal factors and causal mechanisms therein can be managed by people. In other words, although the performance causality network is infinite in theory, organisations are often able to understand and manage the causal factors and causal mechanisms at a certain level, which is limited by human's cogitation capacity, practical capability or subjective will. Based on this understanding, this study calls the causality network constructed with selected desirable outcome itself and its cognisable, specific and achievable causal factors and corresponding causal mechanisms as performance network. Further, in performance management practice, people only develop and manage key causal factors and causal mechanisms in line with the detailed organisational objectives and strategies. This study may call the performance network only contains key causal factors and causal mechanisms as the performance tree. In the next few sections, the performance tree, key causal factors and causal mechanisms are discussed in detail.

4.4.2 Performance units

Because of theoretical and practical convenience in managing the performance network, people often only select some groups of limited causal factors cognised and convenient for management, to form the performance generation units to manage, to be called performance units.

The motivation is that most of the practical convenience in management as it is more efficient to manage different parts of it separately and then aggregate. A common type of performance unit can be taken as an example, which is the existing departments, working groups, task forces, decision-making committees (Mintzberg, 1992), in a real organisation. This type of performance units can be set up by different criteria: by people's knowledge and skills, by work processes and functions, by objectives and outcomes, by geographical regions, and by working times, or by mixed criteria (Aquinas, 2009). In the practice of organisational management,

establishing performance units according to processes and functions, such as sales performance unit, manufacturing performance unit, research and development (R&D) performance unit, marketing performance unit, human resource (HR) performance unit, finance performance unit, and maintenance performance is perhaps the most commonly considered way. To some extent, this method is very much like departmentalization in an organisation (Galbraith, 2014). For instance, a company may have several departments, with each handling a specific group of tasks – such as manufacture department, marketing department, research department, financial department, etc. Since the company organises tasks into departments according to resources, skills, knowledge and expertise, and with the coordination of its departments, it achieves high levels of efficiency.

In essence, from the concept of the performance units in an organisation, it does not necessarily have a relationship with the organisational structure or chart. However, by the establishment of performance units, there will emerge different scenarios of the relationships between itself and the existing organisational chart. In practice, a performance unit coincided with an existing organisational unit refers to an actual performance unit.

However, the performance units also can be set up differently from departments or actual units in a real organisation. This type of performance units mostly represents a kind of causal mechanism or managerial logic for achieving specific organisational objectives. When the relevant objectives have already been considered in an organisation, the designed performance unit can be mapped with one or some existing departments/staffs, and its functions can be achieved by multiple departments or staffs (Liu *et al.*, 2012). Otherwise, the function of the unit could be newly assigned to existing departments/staffs or establish a new department for achieving it. The performance unit created by this way refers to virtual performance unit (see Figure 4-2).

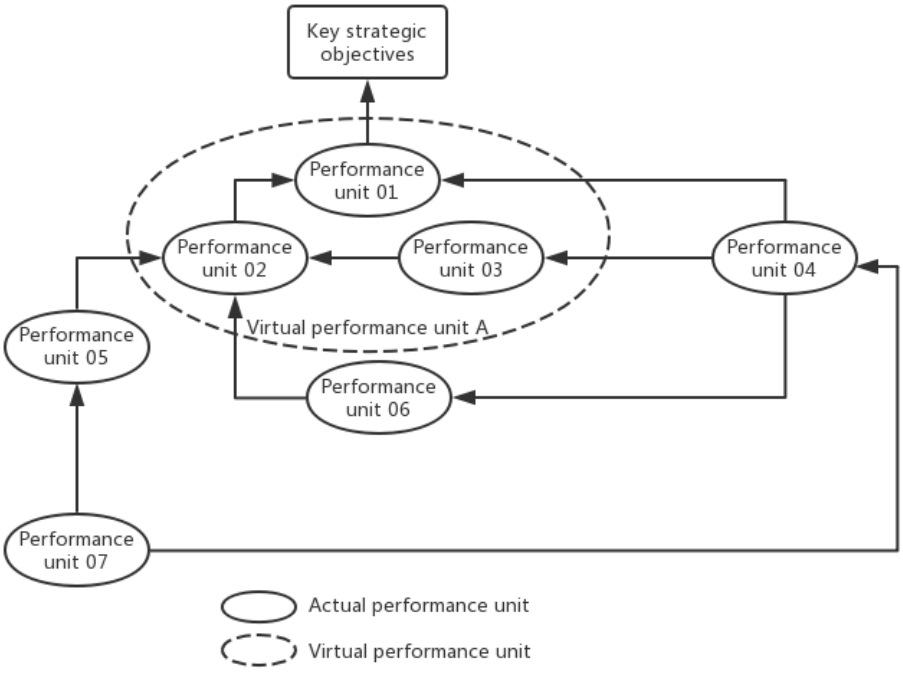


Figure 4-2 Actual and virtual performance units

For example, to achieve high product output in a company, if there is a production performance unit includes manufacture, technology development and quality control management may better facilitate to realise the production objective. However, the manufacturing department, technology development department and quality control department are all separated in an actual organisation. Thus, the production performance unit is a virtual performance unit in the performance network. Nevertheless, if the company re-engineers its organisational structure by combining manufacture department, technology development department and quality control department into a new manufacture department, the performance unit that is mentioned above thus becomes an actual performance unit. In practice, the concept of virtual performance units can be used to propose an improved management structure or other possible configurations for the organisation, further could present scenarios for departmental adjustment, even organisational structure changes.

It should be noted that often outcomes of a performance unit cannot be generated just by the causal factors inside this unit, as people often may think. However, in practice, organisations will make a performance unit self-contained as much as possible in the sense that it has its resources, key stakeholders … most completely.

4.4.3 Performance set and performance map

In order to indicate and further realise the management's intentions for the performance unit, a concept of performance set is introduced. Performance set in a performance unit refers to a series of objectives and corresponding metrics, which are utilised to convey the organisational and unit level objectives and the corresponding metrics for measuring the unit's performance (see Figure 4-3). Therefore, a performance unit contains its outcomes, corresponding causal factors for achieving pre-set objectives, and the associated performance set. The performance units and performance sets can be used to develop a flexible and effective performance management system for an organisation.

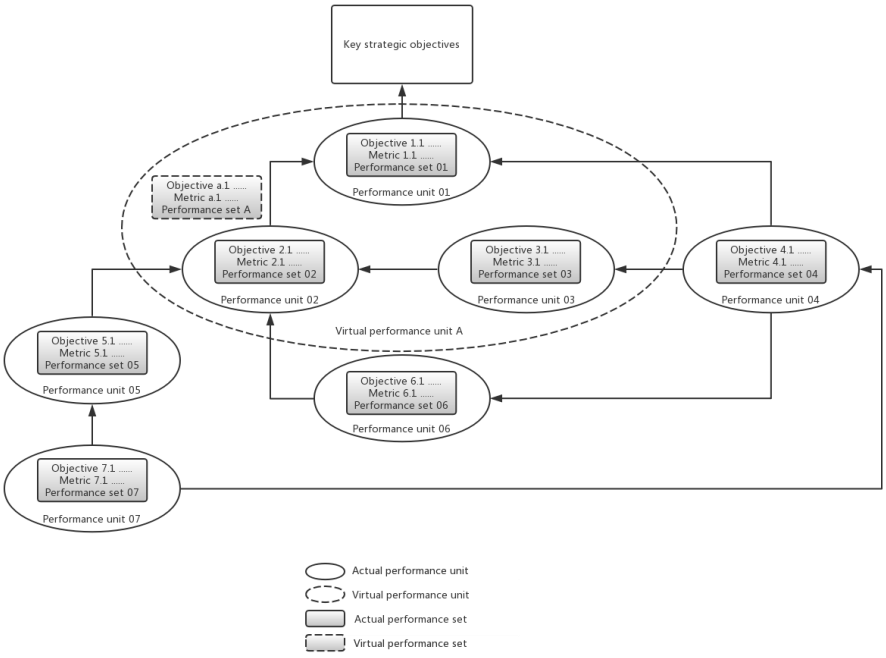


Figure 4-3 Performance set for performance unit

However, more often than not, key performance indicators (KPIs) and departments are wrongly designed in real organisations(Kerssens-van Drongelen and Cooke, 1997). In practice, performance sets do not consist of KPIs defined by the organisation only.

In performance management, the organisation will assign the decomposed objectives and metrics for each performance unit. The objective and strategy decomposition can use the BSC model. The design of the metrics can be designed via the 3E theory introduced by Liu and his colleague (Liu *et al.*, 2010).

However, in general, a performance set of a performance unit is not able to present all the sub-objectives and metrics of the sub-performance inside. The reason is that the manager of each performance unit often has his own management requirements/aims and specified measures. Therefore, they will select some from the given performance set and add some of their specific aims and metrics, and put them into the performance unit's practical performance set. Ideally, the detailed contents of a group of performance sets will have a hierarchical structure. A high-level performance set practically only give the primary coverage of its immediately lower-level performance sets. The lower-level performance sets will extent the contents from their own management demands, which also could enhance the management effectiveness by reflecting the local managerial preferences.

The graph mode of representing the performance and its structure which is used above refers to a performance map. It is a convenient performance network visualisation tool. In a performance map, each of the nodes indicates a performance unit, and the arrowed line linked the nods represents a particular logic/management relationship. The performance map is illustrated by the following examples. A business school's goal is to achieve a world-class business education at a top 20 business school in the country. The strategies are also made by the school, which include three aspects: the education will be recognised for its distinctive and high-quality student experience; the research will be undertaken and published to advance knowledge and professional practice in business disciplines; industry engagement will be a hallmark by the school's activities. The key strategic objectives accordingly are: developing and enhancing students' abilities to contribute to the creation and sustainable development of enterprises; developing and supporting a vibrant research community, and increasing the impact of school's research on the national and international academic community; playing a significant role in the social and economic development of the region by disseminating school's research to managers and business professionals, the business community, and policymakers.

To achieve the above key strategic objectives, a performance map is established (see Figure 4-4) to illustrate the generation of organisational performance by various performance units in the business school. At the top level, the performance units of the business school according to its key functional sections, are first created. Thus, the performance map in this level is quite simple, which contains very few information about performance generation processes. However, it is still can be seen that the performance of academic staff section should be most critical to the accomplishment of the key strategic objectives.

Figure 4-4 Business school performance map in general

Furthermore, a more detailed performance map is developed (see Figure 4-5) with more concrete performance units which are existing in the business school, such as operational research group, finance group, administration group, etc.

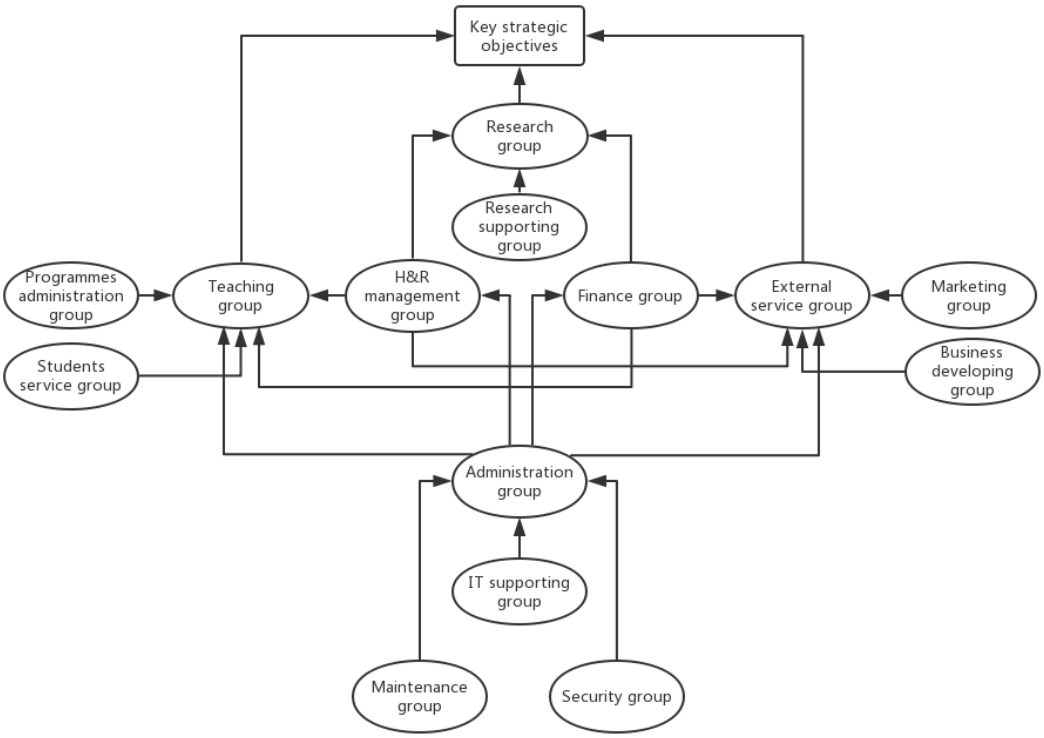


Figure 4-5 Enlarged Business school performance map

In this more detailed performance map, research group, teaching group, and external service group are critical, because they determine whether the key strategic objectives are

accomplishable or not. Other groups, such as H&R management group, finance group, administration group, even maintenance group and security group, make their contribution to the top objectives indirectly.

However, the maintained group and security group may not be in the business school performance tree/network, as they are not indispensable part to ensure the key strategic objectives being met. However, if the business school's is located in an unstable area or is a popular tourist attraction because of its centuries-old history, then the security group might be hoisted into its performance causality network.

Moreover, the specific configuration of a performance causality network is determined by the organisation's key strategic objectives. For instance, if the business school's key strategic objective is modified, the structure of the performance network may have a great change. When the business school is going to be a teaching school, and then the modified performance map can be shown below in Figure 4-6:

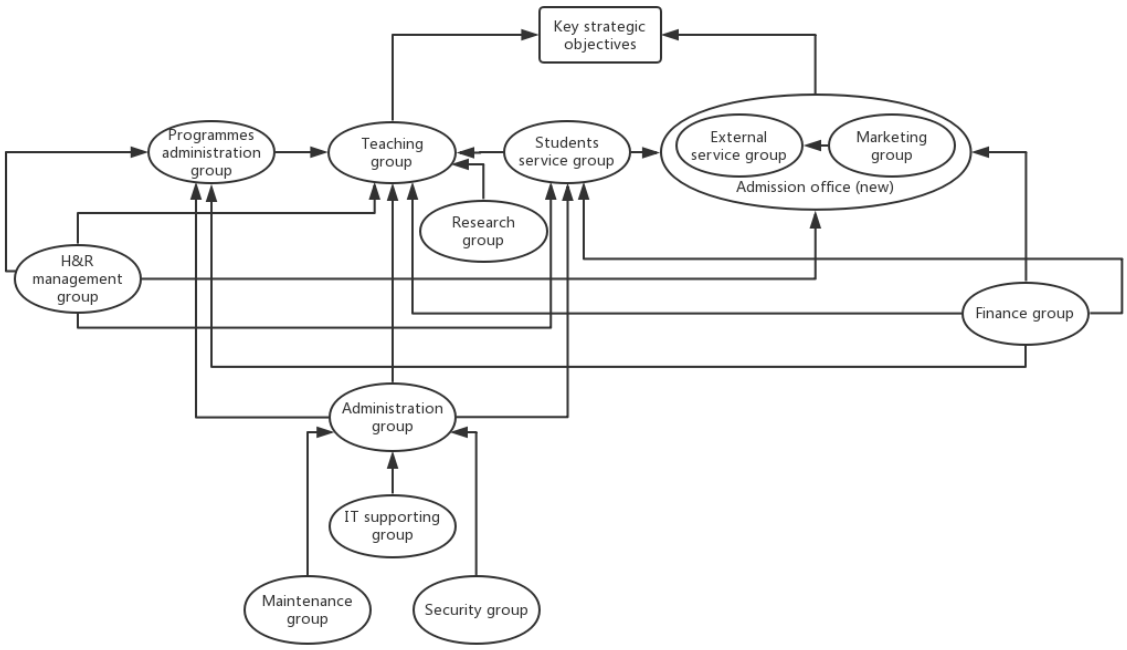


Figure 4-6 Business school modified performance map

Comparing with Figure 4-5, not only the internal connections of the performance units are largely changed, but also some new performance units are established to support the modified objective.

The performance map can be structured by even finer performance units. For example, the administration group can be replaced by a facility management unit and a reception unit etc. By this way, the performance map can approach to an exhaustive structure chart, yet the interrelation between each performance unit will appear much more complex. Thus, the extent to which the resolution of performance map selected should depend on the specific management purpose.

Moreover, restricted by the limitation of the resources (such as time and material resources), the management will only choose the indispensable part of the performance network to manage, for achieving top objectives with the lowest cost (Kaplan and Cooper, 1998). For instance, a cleaning unit or a guard unit normally will not be involved in a desirable performance network for achieving the company's marketing strategies. However, practical performance network and its performance units could be dynamically adjusting, because of the changing of the core business process, applied technologies, operational strategies and organisational objectives. When the company begin to produce hi-tech electronic components, well maintained dust-free plants are essential for the production process. In this case, the cleaning unit has to be involved in the performance tree as one of the key performance units. Following this idea, if a performance unit only contains the indispensable sub-performance units and resources, that still can accomplish its pre-set objectives, this study calls it as a "lean performance unit".

Preliminary study shows that an organisation can adopt various methods to establish suitable performance units and develop an effective performance network for management. Hence, there will be a variety of performance units and performance network in practice. For example, an organisation can just follow the existing organisation's chart, organisation objectives and strategies, and operational process, as the fundamental of the performance network. Then the managers can use an explicit management logic, such as the BSC model (Kaplan and Norton, 1992), to develop a management structure according to its pre-fixed logical frameworks, for carrying out performance management. Moreover, another way is to design a tailored management process for developing and managing performance network, such as adjusting or redesigning the organisation's current operational process by utilising some methodologies, i.g. SSM Logic model, and discussing with key stakeholders (Liu *et al.*, 2012). Moreover, mixed approaches are often used in practice. Suitable grouping will depend on many factors, such as organisational strategies, core technologies, personnel, product characteristics, internal and external environment, etc. Thus, grouping performance units into a performance network are, in fact, a flexible tool for management.

4.5 Performance Tree Management Framework

In the previous section, the performance network is analysed, and then an elementary performance management approach is proposed on the basis of identifying and setting performance units and performance sets. Other than that, there should be a variety of performance management methods because of the enormous causal factors and causal mechanisms in terms of different scenarios in the management reality.

This study summarises nine types of causal factors of organisational performance from the literature (see Table 4-1).

Table 4-1 Nine types of causal factors of organisational performance

Critical Causal Factors	Causal Factors in Literature	References
Action	Internal business processes	Kaplan, R.S. and Norton, D.P. (1996), "Linking the balanced scorecard to strategy", California Management Review, Vol. 39 No. 1, pp. 53-79.
	Processes	Joaquín Gómez Gómez, Micaela Martínez Costa, Ángel R. Martínez Lorente, (2011) "A critical evaluation of the EFQM model", International Journal of Quality & Reliability Management, Vol. 28 Issue: 5, pp.484-502. Otley, David T. (1999), Performance Management: A Framework for Management Control Systems Research. Management Accounting Research,10,363-382.
	Processes, maintenance,	Lebas.M., Performance measurement and performance management, International Journal of Production Economics 41(1–3) (1995) 23–25.
	Task requirements	Burke, W. W., & Litwin, G. H. (1992). A Causal Model of Organisational Performance and Change. Journal of Management, 18(3), 523–545.
Human	Training, job design, compensation and incentives	Paul, A. K., & Anantharaman, R. N. (2003). Impact of people management practices on organisational performance: Analysis of a causal model. The International Journal of Human Resource Management, 14(7), 1246-1266.

	Rewards	Otley, David T. (1999), Performance Management: A Framework for Management Control Systems Research. Management Accounting Research,10,363-382.
	People	Joaquín Gómez Gómez, Micaela Martínez Costa, Ángel R. Martínez Lorente, (2011) "A critical evaluation of the EFQM model", International Journal of Quality & Reliability Management, Vol. 28 Issue: 5, pp.484-502.
	Learning and growth	Kaplan, R.S. and Norton, D.P. (1996), "Linking the balanced scorecard to strategy", California Management Review, Vol. 39 No. 1, pp. 53-79.
	Individual Needs and Values	Burke, W. W., & Litwin, G. H. (1992). A Causal Model of Organisational Performance and Change. Journal of Management, 18(3), 523–545.
	Individual employee characteristics and preference	den Hartog, D. N., Boselie, P., & Paauwe, J. (2004). Performance management: A model and research agenda. Applied Psychology: An International Review, 53(4), 556-569.
Capability	Team Skills, Evolutionary Development Methodology	Thilini R. Ariyachandra & Mark N. Frolick (2008) Critical Success Factors in Business Performance Management—Striving for Success, Information Systems Management,25:2, 113-120.
Resources	Partnerships and Resources	Joaquín Gómez Gómez, Micaela Martínez Costa, Ángel R. Martínez Lorente, (2011) "A critical evaluation of the EFQM model", International Journal of Quality & Reliability Management, Vol. 28 Issue: 5, pp.484-502.
	Human resources	den Hartog, D. N., Boselie, P., & Paauwe, J. (2004). Performance management: A model and research agenda. Applied Psychology: An International Review, 53(4), 556-569.
	Resources	Thilini R. Ariyachandra & Mark N. Frolick (2008) Critical Success Factors in Business Performance Management—Striving for Success, Information Systems Management,25:2, 113-120.
Context	External environment, Organisational Culture, Climate	Burke, W. W., & Litwin, G. H. (1992). A Causal Model of Organisational Performance and Change. Journal of Management, 18(3), 523–545.
	Social context	Paul, A. K., & Anantharaman, R. N. (2003). Impact of people management practices on organisational performance: Analysis of a causal model. The International

		Journal of Human Resource Management, 14(7), 1246-1266.
	Organisational context (internal and external environment)	den Hartog, D. N., Boselie, P., & Paauwe, J. (2004). Performance management: A model and research agenda. Applied Psychology: An International Review, 53(4), 556-569.
Management	Leadership	Joaquín Gómez Gómez, Micaela Martínez Costa, Ángel R. Martínez Lorente, (2011) "A critical evaluation of the EFQM model", International Journal of Quality & Reliability Management, Vol. 28 Issue: 5, pp.484-502. Burke, W. W., & Litwin, G. H. (1992). A Causal Model of Organisational Performance and Change. Journal of Management, 18(3), 523–545.
	Champion, Management Support, Strategy alignment	Thilini R. Ariyachandra & Mark N. Frolick (2008) Critical Success Factors in Business Performance Management—Striving for Success, Information Systems Management,25:2, 113-120.
	Key Objectives, performance objectives and measurement	Otley, David T. (1999), Performance Management: A Framework for Management Control Systems Research. Management Accounting Research,10,363-382.
	Management Practice, Structure	Burke, W. W., & Litwin, G. H. (1992). A Causal Model of Organisational Performance and Change. Journal of Management, 18(3), 523–545.
Stakeholder	Customer	Kaplan, R.S. and Norton, D.P. (1996), “Linking the balanced scorecard to strategy”, California Management Review, Vol. 39 No. 1, pp. 53-79.
	People results, Customer results, Society Results	Joaquín Gómez Gómez, Micaela Martínez Costa, Ángel R. Martínez Lorente, (2011) "A critical evaluation of the EFQM model", International Journal of Quality & Reliability Management, Vol. 28 Issue: 5, pp.484-502.
Strategy	Strategy	Joaquín Gómez Gómez, Micaela Martínez Costa, Ángel R. Martínez Lorente, (2011) "A critical evaluation of the EFQM model", International Journal of Quality & Reliability Management, Vol. 28 Issue: 5, pp.484-502. Otley, David T. (1999), Performance Management: A Framework for Management Control Systems Research. Management Accounting Research,10,363-382. Burke, W. W., & Litwin, G. H. (1992). A Causal Model of Organisational Performance and Change. Journal of Management, 18(3), 523–545.

Communication	Effective Communication, Data Management Infrastructure	Thilini R. Ariyachandra & Mark N. Frolick (2008) Critical Success Factors in Business Performance Management—Striving for Success, Information Systems Management,25:2, 113-120.
	Information flows	Otley, David T. (1999), Performance Management: A Framework for Management Control Systems Research. Management Accounting Research,10,363-382.

Although such classification inevitably leaves a gap from the completeness, still it can cover the most case in performance management. In this case, this study calls them as critical causal factors for performance management. In fact, there are often limited critical causal factors involved in the most popular or classical performance management models, such as BSC is a model with four critical causal factors (Kaplan and Norton, 1992), EFQM excellence model employs six critical causal factors for achieving its ultimate performance objective (EFQM, 2013), even Otley's five questions of performance management only proposes five critical causal factors (Otley, 1999). To some extent, this indicates that performance management, as a comprehensive management practice, does not necessarily need an all-inclusive scheme, but rather highlights the key issue of the organisation (Ferreira and Otley, 2009), which is what this study calls the key performance factors.

Moreover, the reason for managing the causal factors in part is that not all the cause factors of desirable outcomes can be ethnically and economically understood and managed. For example, those outside the organisations may not be managed easily and, those outside the working hours, or those too detailed such as how to present lectures in classrooms, may be removed out of normal management scopes. Thus, depending on laws and management resolutions, decisions have to be made only to select some of the causal factors and corresponding causal mechanisms in performance management. Such selective decisions are normally made by their key stakeholders – without them achieving desired outcomes is not possible.

Furthermore, in actual organisation management, there are a variety of different management methods/patterns in an organisation, such as strategic management, financial management, human resource management, operations management, production management, information technology management, marketing management, security management, external stakeholder management, public relations management, supply chain management, etc. Each of these management methods plays a relatively independent role in their respective management areas

(Whitley, 1999). From a causality perspective, each management area often can be seen as one or some of the critical causes. For instance, strategy management mostly focuses on managing the critical causal factor of strategy and human resource concentrates on the critical causal factor of human, resources and capability.

Therefore, the performance management should put more focus on the overarching level coordination of each management branches in an organisation, if all the local management is running perfectly (Andersen, Henriksen and Aarseth, 2006). This study calls this type of coordination as global coordination, which is a key causal mechanism throughout the entire performance network. Of course, before establishing a performance management system with global coordination for an organisation, It is still necessary to identify the key causal factor of selected desirable outcomes according to a different context and check if they all under the local management.

The performance tree is a human-made performance generation structure of responding to management needs based on people's cognition ability and management intent. Though the performance tree is only a part of the underlying performance network, it is still possible for people to approach their desirable results by managing it. The reason is that a performance tree is perceived as an embodiment of the underlying performance network, which means it has the tendency to realise the desired results.

Although the critical causal factors selection processes and their results will be many and various, this study still finds out some general laws/principles by the view of the causality in performance. Because the selection of the causal factors is aimed at the selected outcomes, the different characteristics of outcomes must inevitably influence the decision-making process and results (Elbanna, 2006).

In performance management practice, the selected outcomes can be split into two types. One is output, which can often be specifically described, and mostly is stable (causality) and short-term. Another one is the impact, which is often long-term and uncertain(causality) at the time. For output, its causes should be mainly inside the boundary of an organisation (Qi, 2010; Liu *et al.*, 2010). Thus, they can be easily perceived by the existing organisational strategy in a simple-minded decision-making context. At this point, the core of performance management is to achieve the output by managing its causes. The best result of this kind of processes is restricted to satisfy the intended output, which refers to bounded rational performance management (Bianchi, 2016).

For impact, there must be a considerable part of the causes that are not inside the boundary of an organisation. Hence, the incomprehensibility and variability of the organisation's external environment are likely to lead to the inaccuracy or inefficacy of the causes selected by the traditional strategy formation and implement processes. Furthermore, even the organisation, fortunately, finds the external causes of impact, how to manage these labile causes outside the organisational control domain is still not an easy task. In this case, an organisation may tackle the matter by utilising the indirect causes, which are more universal causes of the impact, such as the competence of personnel, the method of operating, the personality of individual and term, and organisational culture, etc. By optimising these universal causes, the organisation tends to achieve the greatest degree of the impact. This process refers to rational performance management (Spender, 2015). It should be noted that the above causes usually cannot be directly obtained by the existing strategy decomposing process. In most case, organisational learning is unquestionably beneficial to make better non-programmed decisions on the cause selection of the impact. By this method, the organisation's institutionalised strategy might be optimised, which would lead to a breakthrough in organisational performance. In practice, organisational performance mostly has output and impact with the different corresponding values (Liu *et al.*, 2010). No matter which method is used to select the causes, either strategy decomposing or essence improving, there must have a specific function in charge of this stage in performance management.

So far, based on the introduced new definition of performance and the new concept of performance tree, as the ultimate outcomes of performance are rooted in the underlying performance network, for achieving the desirable outcomes, people select some critical causal factors to develop a performance tree and then manage it to achieve the outcomes through selected global coordinative management. Put simply, this study describes ***the Performance Tree Management Framework as enhance organisations' performance by developing performance tree, interacting with its objectives and strategies, and then managing the performance tree by using global coordination***. As this study proposes that the most important concern in actual performance management is the global coordination of selected key casual factors and causal mechanisms, that is, the global coordination of performance trees, called performance tree-based performance management.

Compared with the existing performance management frameworks, the Performance Tree Management Framework has a distinctive performance generation process view and has a networking structure. These characters provide the Performance Tree Management Framework

with a more holistic perspective of performance management. Analysing, designing and managing the performance tree constitutes an almost complete path to the desired organisational goals. It should be noted that the relation of developing performance tree and managing performance tree are not simply before and after among performance management processes.

In summary, the new definitions of performance, performance management and the concept of performance tree not only provide greater explanatory power in performance management theory but also increase more flexibility for different types of organisations and diverse management environment in practice. Especially, the concept of "performance tree", and "virtual performance unit" might help the organisation building up a general organisational structure for a type of enterprises with very similar objectives and strategies, which may lead to a substantial improvement in the practicability of benchmarking. At the same time, it also may help an individual organisation re-examining the existing organisational chart and objective development system if they support and interlock with each other, and help the organisation carry out reform interactively when it is necessary. Moreover, most of the existing performance management models can be examined and interpreted by the Performance Tree Management Framework, which provides a possible way to build a unified framework for performance management.

4.6 A brief discussion of the performance units

Based on the above discussion about the theory of the performance tree-based performance management, it can be seen that the ultimate outcomes of an organisation's performance relay heavily on the characteristics of each performance unit therein. Thus, further analysis of the features of the performance unit is carried out. From a functional perspective, how far the performance objectives can be achieved is influenced by various functions of performance units, which embodies in different work content. According to the literature review, the crucial dimensions of work content in the organisation are job complexity and task variation (Zhang and Gwizdka, 2014), and this study calls them complexity and variation in short. In the performance tree, the tasks can be achieved either in a standardised method or in a none-presupposed manner, which corresponds to the above two dimensions. That is to say, the higher the degree of complexity, the more specialized performance unit tends to be. Typically, the

performance units, in this case, are mostly professional. On the other hand, the higher degree of variation, the more integrated performance unit tend to be. In general, this kind of performance units is relatively agile.

This study proposes that the core tasks of a performance unit can be classified based on the degree of these two dimensions. By combining the higher and lower tendency in each dimension, there appear four fundamental types of performance units (see Figure 4-7).

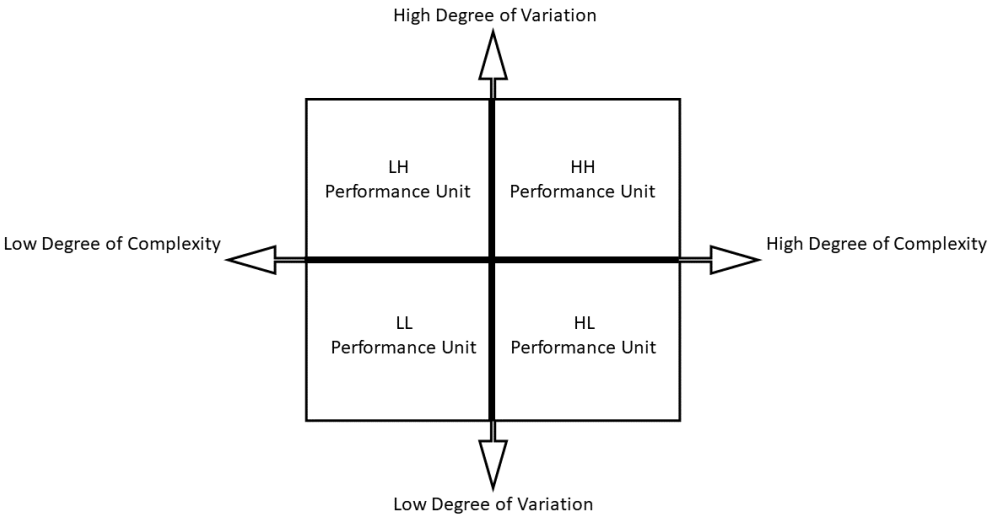


Figure 4-7 Four fundamental types of performance units

Low complexity – low variation (LL) performance unit, which mainly contains simple, mechanical, and repetitive work content, such as simple production line workers group, cashiers' group, cleaners' group and some of administrative staffs group.

Low complexity – high variation (LH) performance unit, which mainly contains unskilled work content but needs to deal with diverse and complex situations, such as sales group, and customer service group.

High complexity – low variation (HL) performance unit, which mostly contains professional and high technological work content in a stable environment, such as pilots' term typically.

High complexity – high variation (HH) performance unit, which contains expert and comprehensive work content within sophisticated situations, such as investors term and scientists' group.

It should be noted that the classification of “high” or “low” is not absolute but relative in practice.

For the LL performance unit (i.e. the main tasks of the units are LL classified), since the work content is mostly simple, mechanical, and repetitive, the whole unit does not need much professional training but general skill orientation. The function of this type of unit normally has clear operational processes, which means it is easy to regulate and oversee. Typically, the core operation department of a mechanic bureaucracy organisation belongs to this category (Mintzberg 1983). In this case, direct supervision with specific and detailed regulations is suitable for its daily management activities. Moreover, people in this type of unit will be given regulations related and basic operational skills training.

For the LH performance unit, the work content is not complex in specialization, but variable in working scenarios. Compared with the management method of LL performance unit, this kind of unit needs more authority and freedom. People in it do not need a long period of professional training to fit their corresponding roles. However, they need to shape their competence in dealing with a variety of situations, such as outstanding guest services skills, professional presentation and sophisticated communication skills.

For the HL performance unit, the work content has a highly demanding of expertise and technology, although it does not need to deal with constantly changing environments. The corresponding management methods should be based on highly understanding of the unit’s specific and core professional area. The aim of management is to ensure its objectives is achieved by carefully and reliably transforming those high-skilled abilities. People in this kind of unit need to be competent for their tasks by diligently and comprehensively training.

For the HH performance unit, the work content is somehow much unpredictable besides the feature of the highly complex skills. To manager this kind of unit, it is both difficult and inappropriate to set established management methods or fixed operational process, and the culture, the value will be the crucial orientation of management practice. The ultimate outcomes are mostly the only measurement for the unit’s performance. People in this kind of unit pay more attention to their innovativeness and flexibility than other types of units.

Furthermore, performance units classified by the above criteria imply diverse performance preference. Form the literature, efficiency and effectiveness are the two basic dimensions of performance (Ostroff and Schmitt, 1993). In an organisation, efficiency refers to the comparison of its input and output, which embodies technical efficiency from the perspective

of resource combination and allocative efficiency from the perspective of cost and benefit. In contrast, effectiveness refers to the comparison of its attained outcomes and original objective or prospect. The actual performance is an integration of efficiency and effectiveness, although there may be a trade-off between the two (Mahoney, 1988). Promotion along one of the two dimensions could entail regression along with another one (Kopelman, Brief and Guzzo, 1990). In this sense, the organisational performance can be efficient, effective, both, and neither, which refers to the preference of performance. It should be noted that there are more types of performance preference, such as reliability, flexibility, agility, etc. Here, this study only selects more import and common dimensions to analyse.

It is found that the performance units involve high complexity, high variation or both, are usually efficiency-oriented. Because of the complexity of work content, these kinds of performance units are hard to apply standardized management to its operational process or business outcomes. Mostly, the performance units are more focus on flexibly organize resources and technologies in line with the specific requirement of external customers. Simply enhancing efficiency cannot meet customer needs and organisational development. Thus, this study names the LH, HL and HH performance units as type H performance unit. In contrast with type H performance unit, as the LL performance unit has both low complexity and low variation on its work content, it is easier to carry out management by standardising core process and business outputs. This study names it as type L performance unit.

4.7 Summary

This study, to this point, has investigated the knowledge syntheses of performance in the management context and abstract the core characteristic of performance, i.e. the causality, from the relevant literature through a systematic review. A new performance definition is proposed based on the CR paradigm. The constructs in the abstract new performance definition are mapped to an existing definition, which shows its universality. The structure of the performance is profoundly explored and concreted to develop a new Performance Tree Management Framework. Based on the above work, the core elements of the new management framework, i.e. performance tree, global coordination, are proposed, which can be used as the basis for the next step research on consolidating the Performance Tree Management Framework.

Chapter 5 Developing and Managing Performance Tree

In the previous chapter, the concept of the Performance Tree Management Framework has been introduced, which aims to promote organisational performance by developing and managing the performance tree using global coordination. However, this framework is not detailed enough to implement in practice yet. In this chapter, how to develop and manage the performance tree using specialisation and global coordination is elaborated and explained by some examples. Afterwards, a discussion illustrates that most of the classical performance management frameworks can be fit into the Performance Tree Management Framework, and innovative performance management approaches might be developed by modifying or extending ideal performance units, coordination architectures and global coordination approach into this framework. Finally, the groundwork for implementing the framework in practice are briefly discussed.

5.1 Developing and management performance tree in general

The Performance Tree Management Framework mostly involves two stages of management processes. One stage is to develop a performance tree with certain performance units for an organisation, which is to formulate, by identifying, improving or reconstructing, the performance units according to organisation's objectives, strategies and actual situations. Developing a performance tree will generate cognised coordination mechanisms to affect the management of the performance tree in an organisation. For managerial convenience, people often can use the existing organisational structure as a performance tree (Bititci, Cocca and Ates, 2016). Another stage is to manage the developed performance tree using global coordination, which is to aggregate all the sub-performance of formulated performance units into overall organisational performance using explicit coordination, by which people expect the performance can be coincident with or close to the pre-defined targets.

It should be noted that the relation of developing performance tree and managing performance tree are not simply before and after among performance management processes. In fact, they

often blend and interact with each other. For example, when people develop a performance tree for an organisation, the corresponding structure of the performance units inevitably arise a fundamental coordination mechanism which may be used to manage the performance tree directly. Furthermore, when the existing performance tree structure is not suitable for the desirable coordination that about to be applied, people may have to adjust the performance units and the performance tree structure first (Adler, 2018). Therefore, performance tree management will be iterative processes (Youness *et al.*, 2016) with developing and managing performance tree for achieving continuous improvement of organisational performance. However, to give a clear explanation of how to develop and manage a performance tree, this study discusses them separately in the next few sections.

5.2 Developing a performance tree

The starting point of performance tree management is to develop a suitable performance tree for an organisation firstly. In most cases, the existing formal or informal components in an organisation, such as departments, groups, units, working teams, committees, etc., may be treated directly as performance units to form a performance tree, and this is due to both the consideration of management convenience and the limitation of performance management characteristics. Furthermore, all the departments/units in an organisational structure often may be regarded as a set of performance units for performance tree management in different levels of an organisation.

However, in some other cases, people may find the organisation's structure is unfit for achieving its objectives and strategies. Thereby, people have to develop a specific performance tree totally new, or partly new while keeping most of the existing organisational structure. Hence, it is necessary to discuss the methods of developing performance tree along with performance units (Zheng, 2017).

Practically, the overall purpose of formulating a certain number of performance units and then developing a performance tree of an organisation is often to improve operational and managerial efficacy, efficiency and effectiveness (Liu *et al.*, 2010). The ways of formulating performance units are diverse, as they grow out of people's understanding of the outcomes of desirable performance from causal perspective and management demands. One of the most wildly used approaches of formulating performance units in practical organisation management

could be specialisation (Wegner and Koetz, 2016; Smith and Bititci, 2017; Kasale, Winand and Robinson, 2018; Kimaro and Fourie, 2018). From the perspective of the organisation and management theory (Miles, 2012) and management control theory (Flamholtz, 1996), the benefits of specialisation have been acknowledged in many study and practices (Mullins, 2005; Harris, 2017; Dawid, 2019). Hence, this study takes the specialisation as an example to discuss the process of developing performance tree below. However, it is worth noting that there could be other management techniques that can be adopted in the performance tree development process.

In performance tree management, specialisation mainly means grouping expected causal factors and causal mechanisms into different performance units. It is confined by people's cognition and anticipation (point of view). The purpose of specialisation is to simplify operations and clarifies the objectives, ultimately leads to operational and managerial efficiency, in practice (Kumar and Suresh, 2009).

In management practice, some common criteria of specialisation can be used to group causes for achieving the selected outcomes of desirable performance in an organisation, which also depend on different desirable management principles and actual management requirements. The grouping can be carried out by people's knowledge and skills, by work processes and functions, by objectives and outcomes, by geographical regions, by working times, or by mixed criteria (Walker, 2019). Moreover, it can be carried out by key causes of performance, or a specific managerial logic. All the performance units developed by specialisation then linking together alone the performance generating flow constitutes a performance tree.

In the following section, this study shows some samples of performance tree that are formed with different types of performance units by using different specialisation methods, which are helpful for the implementation of the framework in practice.

5.2.1 Creating a function-oriented performance tree

In this section, a generic performance tree is created for organisational performance management from a functional perspective, and of course, this is only one of the options. The function here refers to the specific and principal activities of a unit covers for actualising and managing certain causal factors and/or causal mechanisms. The performance tree developed by this way for an organisation could very much close to its actual organisational chart, as functional departmentalisation is one of the most popular methods to organise activities and

form structure for organisations (Mullins, 2005). Therefore, function-oriented performance tree can be used in most of the organisations, especially when the organisations do not want to modify their organisational structure significantly during their implementation of performance tree management.

To fix the idea, strategies, actions, stakeholders, resources, regulations and environments are selected, which are six commonly categorical causes for achieving the organisational objectives in actual management practising (Robbins and Coulter, 2017), to build the fundamental categories for creating the performance units.

Specifically, the performance units in the action category should contain the key processes to produce the outcomes of organisational performance directly (Slack and Brandon, 2018). People in these performance units perform the key actions of producing the products, rendering services, selling products, or researching and developing new technologies, even creating new knowledge, which the type is determined by the organisational objectives and strategies. Thus, the action in these performance units represents the core business operation of the organisation.

The performance units in the regulation category are to transmit the organisational strategic intent to the action performance units by establishing formal rules on working processes, that normally embodied in designing, planning, reengineering the core operation workflow and developing technological specifications, which makes the operation processes more efficient and effective (Singh *et al.*, 2017). In addition, these units also develop formal and informal rules on people's behaviour at a global level. It is the key linkage between the strategy performance units and action units. People in this unit are mainly functional department staffs and technicians.

The performance units in the resources category are to fully plan, configure, utilise, and develop organisational resources, which is vital for the achievements of organisational strategies (Hitt, Xu and Carnes, 2016), and provide support for the action performance unit. People in these performance units are resources management staffs, such as labour management staffs, raw materials management staffs, capital management staffs, and information management staffs.

The performance units in the environment category are to identify and manage the constantly changing factors, both internal and external, that affect the operation of the organisation (Yadav, Sushil and Sagar, 2014). These performance units are also supervised by the strategy performance units and support the action performance units. People in these units mainly are

organisational culture developer and public relations director. In fact, these units may cover the part of the function of external stakeholder management.

The performance units in the stakeholder category are mainly to develop positive relationships with external stakeholders (e.g., customers, regulators, investors, suppliers, collaborators, partners, government, associations etc.), enhance engagement of internal stakeholders (e.g. employees, managers, the board of directors, etc.) and balance the interests of different stakeholders (Andriof *et al.*, 2003). People in these units could often involve public relationship director, customer service managers, human resources managers, senior executives, etc.

The performance units in the strategy category are located in the very first place of all the units and supervise the other four type of performance units. People in these units are normally owners and top-level managers, such as Chief Executive Officer (CEO), Chief Financial Officer (CFO), Chief Operating Officer (COO), President, Vice President, and members of the board etc. These performance units are mostly charged with analysing and developing the organisation's strategies, strategic objectives and organisational institution, to ensure the organisation's mission can be achieved. Also, this type of performance unit overall arranges all the organisation's activities in line with organisational objectives and strategies.

Often, organisations need to further refine these six categories into detailed performance units with more concreted functions, thereby to gain a detailed performance tree that would facilitate sophisticated performance management requirements. For achieving this, the six performance unit categories can be broken down into detailed performance units by referring to the existing organisational structure and core business processes. For example, the action performance unit can be divided into production performance unit and sales performance unit. The regulation performance unit can be replaced by technology performance unit, marketing performance unit, and administration performance unit. The resource performance unit may be replaced by human resource performance unit, material resource performance unit, finance performance unit and information performance unit. The environment performance unit can be represented by a culture performance unit – in charge of the internal environment, public relationship performance unit - in charge of the external environment. The strategy performance unit may be replaced by the top decision-making performance unit and management performance unit. The former is to establish the mission, vision and value of an organisation, and develop specific or dynamic strategies to carry out the organisation's ultimate mission. The latter is to transmit and implement the strategy and improve the prospect of achieving the overall organisational

goals. Based on the above grouping method, the detailed function-oriented performance tree structure is presented below in Figure 5-1:

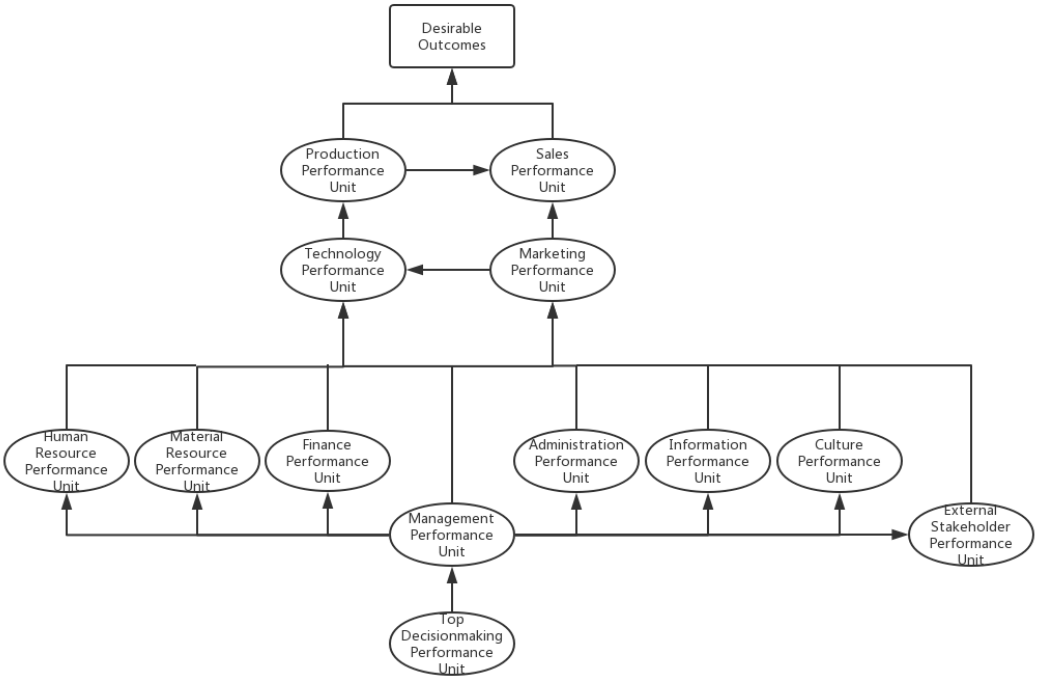


Figure 5-1 A sample of detailed performance tree

In this chart, the interrelationship of performance units is based on people's cognition. In this sense, the lines and arrowheads are merely indicative. Yet for management practice, the relationships shown in the map should reflect people's understanding of the production of desirable performance and their preference for organisation management.

In this function-oriented performance tree, each of the performance units often can find its corresponding department in a real organisation (Hannagan and Bennett, 2007). For showing detail, a table is provided to illustrate the functions and people in different function-oriented performance units (see Table 5-1). However, there will be exceptions. For example, the management performance unit is not necessarily grouped together. People in this performance unit may scatter through various departments, which means that it might be a virtual performance unit in this chart. The distinction of the people in management units from the leaders in every other performance unit is that the role of the people in the strategy performance unit is to transmit and supervise the organisational strategy, while the role of the leader in each specified performance unit is to implement a detailed function.

Table 5-1 The functions and people in different function-oriented performance units

Management Contents / Units	Function	People in unit
Top decision-making	Establishing an organisation's mission, vision, value and strategy.	Owner Shareholder Top manager Secretary
Management	Transmitting and implementing an organisation's strategy in the most efficient way. Administrating the work process.	Middle manager Department manager
Human resource	Training employees and helping personal development to meet an organisation's need. Managing job recruitment, selection, and promotion. Developing and overseeing employee benefits and wellness programs.	Planning and recruiting staff Training and development staff Wage and welfare management staff Employee relations management staff
Material resource	Planning, organising and controlling the flow of materials for the entire organisation.	Purchasing staff Supply chain management staff Inventory controlling staff
Finance	Preparing management accounting information and analysis to help managers to plan, control and make decisions. Managing money (funds) efficiently and effectively to accomplish the objectives of the organisation.	Accountant Finance and system analyst Auditor
Administration	Ensuring other units can work unhindered and undisturbed by coordinating activities. Supervising the employees to fulfil their required duties and conform to behaviour regulations. Maintaining equipment and sustaining the facility.	Administrator Monitor and evaluation staff Supporting staff
Information	Collecting and analysing information inside and outside the organisation, making adequate use of information for decision making and business process.	Information collecting and analyse staff Information network system developing and maintaining staff People in top decision-making and management units

Culture	Creating a system of shared assumptions, values, and beliefs in an organisation, which has a strong effect on an individual's behaviour and overall performance.	People in top decision-making unit and management units Culture commissioner
External stakeholders	Establishing and maintaining mutually beneficial relationships between an organisation and its external key stakeholders.	People in the top decision-making unit Public relationship management staff Customer relationship management staff
R&D	Obtaining new knowledge applicable to the organisation's business needs, that eventually will result in new or improve products, processes, systems, or services.	Researcher Scientist Engineer
Marketing	Researching what customers want and analysing how the organisation can satisfy these wants.	Marketing staff Event management staff Customer communicating staff
Production	Undertaking the activities necessary to provide the organisation's products or services.	Operator Quality assessment staff Safety management staff
Sales	Generating revenue.	Sales staff After-sale service staff

Through the above discussion, it shows that the performance tree with its performance units developed by a functional oriented method often coincides the actual organisational structure to some extent. However, it is worth noting that, in fact, this method is to produce a performance management structure, which is different from the organisation's management structure in substance. This performance tree development method could be suitable for performance management that will start from specific objectives and strategies, and the organisation does not intend to change its organisational structure much.

Moreover, developing a functional performance tree is not the only way of implementing performance tree management. Organisations can develop a performance tree with or partly with virtual performance units for further performance management. Hence, another example of the performance tree development method is discussed below, which could lead to a performance tree different from the actual organisational charts.

5.2.2 Creating a performance tree following specific managerial logics

As there are many different methods for creating performance units and developing performance management structure for an organisation. The performance units in some kinds of performance tree mostly cannot find their counterpart in the organisational chart, i.e. virtual performance units, yet organisations still can implement performance management by this kind of performance tree that followed with specific managerial logic, such as EFQM excellence model.

EFQM excellence model's managerial logic

In the EFQM excellence model 2013, the organisation's general objective is to achieve business excellence, which in detail is to balance the short-term demands for financial success against the long-term sustainable development (EFQM, 2013). To achieve this objective, the organisation needs to satisfy their customers by developing and delivering products and services that add value to them and retain customers by maximising the organisation's reputation. The above procedure is, delivered by the people who work in the organisation and, is influenced by some key stakeholder groups within society. Furthermore, leadership is believed as the most important element to facilitate the successful organisation's performance. Based on the leaders' clear vision for the future, the strategies that will achieve the organisational goals can be developed, and the involved stakeholders will be engaged. Subsequently, the products and services will be produced by robust internal processes, which ensure the organisation manage its resources effectively and efficiently (Gómez, Costa and Martínez Lorente, 2015). Through this ongoing process, the organisation not only achieves the financial results from customers but also the people results, society results (see Table 5-2).

Table 5-2 The results of the EFQM excellence model

	Results
People	1.Opportunities to develop and grow 2.Work-life balance 3.Pride in the organisation
Customers	1.Value-adding products and services 2.Excellent service
Society	1.Brand reputation 2.Ethical behaviour 3.Transparent communication
Shareholders(owners)	1.Return on investment 2.Optimise profitability 3.Sustainable financial growth

Deriving from leadership, the five parts, which include leadership, strategy, people, society and process, constitute the causes of the four results (see Table 5-3).

Table 5-3 The enablers of the EFQM excellence model

	Enablers
Leadership	Leaders who inspire trust
Strategy	Clearly defined strategy
People	Competent and engaged people
Society	The right partners and suppliers
Process	Robust internal processes

According to the causality and logic relationship of the EFQM model, the performance units and their structure are thus created via performance map (see Figure 5-2).

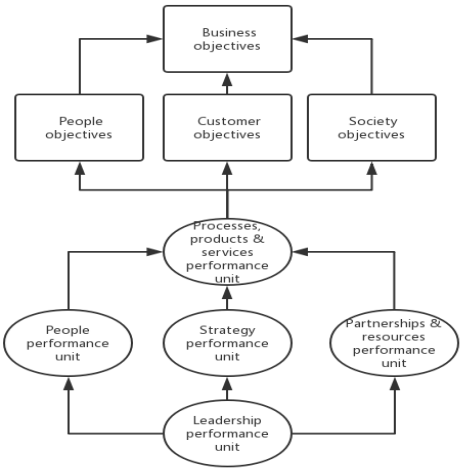


Figure 5-2 A sample performance tree for the EFQM excellence model

Each performance unit has its particular management purposes. The people in leadership performance unit is to

1. develop the organisational vision, mission and value, clarify the organisational objectives and strategies, and behave as a role model of the organisation,
2. develop and monitor the organisation' performance management system, make improvement continually,
3. develop and maintain good relationships with external key stakeholders
4. forge a culture of excellence throughout the organisation,
5. lead the organisation flexibly and effectively response the change from internal and external.

The people in the strategy performance unit is to

1. ensure the organisational strategy development meeting the demands from both stakeholders and the external environment,
2. ensure the organisational strategy development grounds on the reality of internal operational process and capabilities,
3. develop, review and update strategy timely,
4. communicate, implement, and monitor the strategy, to achieving desired outcomes.

The person in the people performance unit is to

1. produce plans to support the implementation of organisational strategies,

2. train, develop and exam the staffs' skills and abilities,
3. motivate the staffs and enhance their engagement,
4. ensure the communication system is effective and efficient throughout the organisation,
5. enhance the staffs' wellbeing, recognise and reward outstanding staffs.

The people in the partnership and resources performance unit is to

1. maintain and manage the organisation’s business partners and suppliers,
2. manage finances to reduce financial risk and improve financial effectiveness,
3. manage infrastructure, equipment, materials and natural resources to improve their utilising efficiency,
4. manage and upgrade essential technologies for enhancing the operational process,
5. manager information and knowledge system for responding changes and supporting effective decision making.

The people in the processes, products and service performance unit is to

1. design, manage and optimise the operational processes,
2. design and upgrade products and services to create value for customers,
3. promote and market products and services effectively,
4. produce, deliver and manage products and services,
5. develop and promote customer relationships.

The performance units in this type of performance tree normally cannot find exactly matched departments in reality. The management purposes of each performance unit often distribute among several departments, even across the entire organisational structure. In this sense, this type of performance tree is suit for those organisations who want to enhance their performance by improving capabilities in various aspects.

By the above example discussed, this study believes that specialisation is a useful method to develop performance tree for organisations, which can simplify operations and management and increase operational and managerial efficiency. In addition, this study also believes that there will be more methods for developing performance tree to establish new performance management models. For example, developing a performance tree in line with the common and core operation process for a certain number of organisations could form a base for creating an innovative and universal performance management model for them (Sangwan and Choudhary, 2018). However, the developed performance tree still needs global coordination to aggregate

and integrate all the sub-performance to meet the overall outcomes defined by the objectives – either short or long terms.

5.3 Manage performance tree by global coordination

In the stage of managing performance tree, performance management mostly focuses on global coordination.

Global coordination here means coordinating performance from more than one performance units/organisation departments to enhance overall organisational performance. When implementing the performance tree management for the organisation, the original coordination might be kept or might be modified by adding extra coordination mechanisms. The purpose of global coordination is to ensure all the performance units/organisation departments can work in an efficient and organised way and, implement control and communication of management in line with the organisational objectives (Mullins, 2005).

The approaches to achieve desired global coordination are various. Based on the literature review on coordination (details see Chapter 3), this study proposes a set of global coordination approaches:

1. Global coordination for accomplishment
   a. By objective/Strategy decomposition,
   b. By improvement process planning,
   c. By rules and culture establishment
2. Global coordination by standardisation
3. Global coordination by global mutual adjustment
4. Global coordination by performance indicators and performance plan
5. Global coordination by feedback

In the following sections, these global coordination approaches in the context of performance management are discussed in detail.

5.3.1 Global coordination for accomplishment

To achieve organisational objectives and performance, all the performance units need to clearly understand what detailed objectives of their own units are and, what sub-performance they have to actualise. Yet, with only the general and grand organisational objectives, each performance unit may perceive the organisational goals differently and tries to achieve them in his own way, which will apparently arise conflicts of operations and further obstruct the achievement of overall objectives (McDermott *et al.*, 2019). Hence, the process of accomplishing the organisational objectives could often be harmonised by global coordination.

In this category of global coordination, there are mainly three types of approaches: objective/strategy decomposition, improvement process planning, rules and culture establishment.

1) Objective/Strategy decomposition

Objective/strategy decomposition is to achieve goal alignment or strategic alignment throughout the chart of an organisation. It is the process by which the organisation keeps its performance units working towards overarching organisational objectives (Liu *et al.*, 2012). When the organisational objectives/strategies are being decomposed, it must ensure that the decomposed goals are in line with the overarching objectives/strategies and every performance units are informed of what they should be working on. Implementing a goal-centric system by objective/strategy decomposition makes certain all the performance units are working towards the pre-set objectives, preventing costly misalignment. Meanwhile, proper objective/strategic decomposition ensures the performance units effectively and efficiently work and synergistically collaborate for achieving the pre-set objectives.

From the performance management practice, there are mainly two types of objective/strategy decomposition methods.

One is decomposing objective/strategy following an explicit or fixed managerial logic. For example, people can decompose the organisational objective/strategy from four specific aspects, e.g. finance, customer, internal process, learning and growth (Kaplan and Norton, 1992). The financial aspect involves whether the organisation's strategy and operations add value to shareholders or how well the strategy and operations contribute to improving the organisation's financial health when organisations do not have shareholders. The customer aspect involves how the organisation's strategy and operations create value to customers. The internal process aspect involves the ability of the internal business processes to add value to

external customers. Finally, the learning and growth aspect involves the strength of the infrastructure for innovation and long-term growth. The inherited logic structure of the linked four aspects, which one aspect contributes to another aspect successively, represents a kind of global coordination mechanism for achieving the overall objectives. Utilising this explicit objective/strategy decomposition method in the performance tree management, each performance units can set up its own performance set easily, which could further form a collaborative working/operating system for achieving and enhancing desired organisational performance, although they do not have to do it in this way.

Another is decomposing objective/strategy following an implicit logic. For example, people can coordinate performance units around five central issues in line with the specific organisational objectives/strategies: (a) the organisational objectives and the corresponding evaluation layout, (b) the organisational strategies, the designed activities and processes for achieving them, and the measurement on these activities and processes, (c) desirable performance and detailed targets, (d) rewarding system for the employees, (f) information transfer system in the organisation (Ferreira and Otley, 2009). Apparently, how to deal with these issues in practice depends on the practical organisational context and different management principles adopted by performance system designers. This is why this study calls it the implicit method. Likewise, the Soft Systems Methodology (SSM) could provide another type of implicit logic for decomposing objective/strategy. However, although the above decomposition methods are implicit, people often can establish global coordination for accomplishing overall objectives by utilising one of them in their performance tree management.

In comparison, the former method is easier to be applied for practice. The explicit logic methods often have more details about the implementation procedures, yet its application must have a premise, that is identifying the specific objectives and strategies first, as organisational objective and strategies are the starting points of this type of methods. On the contrary, while the latter method is more flexible but often without very detailed implementation procedures (Zheng *et al.*, 2019). Notably, if the objective/ strategy decomposition is carried out on the basis of actual performance units, the decomposed goals can be utilised in real organisation chart directly for performance management. If the decomposition is carried out on the basis of virtual performance units, the decomposed goals need to be mapped to real departments/ teams in the implementation of performance tree management.

2) Improvement process planning

In addition to the objective/strategy decomposition, process planning is another practical way for organisations to accomplish their objectives. However, in business management, creating operational processes for business objectives is hardly a core function of performance management. Although in an extreme case, performance management may recreate the operational process for an organisation, e.g. Business Process Reengineering (BPR), yet it is not wildly used in practice (Hashem, 2019). Some people even do not consider BPR as one of the performance management approaches. Hence, from this respect, performance management is to analyse and identify the global weakness or the potential strength for performance improvement of the existing processes for achieving the pre-set objectives, further, to put forward global coordination actions, such as setting up virtual performance units, regulation, the guidance of actions, and targeted training produces, to enhance organisational performance. It should be noted that this approach is applicable not just for individual organisations but for a group of them. As the above approach is mostly process-based (Dayal, Hsu and Ladin, 2001), this study calls it as improvement process planning. The reason why this process/approach is process-based is that only the amelioration is anchored in the core business process, can it generate global level enforcement in organisations. In this sense, the improvement process planning often consolidates as specialised rules or regulations in practice. For example, Song's (2016) first identified the redundant and inefficient issues of bank sales processes, then proposed suggestions for process improvement based his new developed performance management framework for Chinese commercial banks in his study, which received satisfying and the positive feedbacks from the bank managers.

Specifically, through the improvement process planning, organisations can either clarify an optimise core business/operation process that could properly integrate the activities of all the actual performance units, e.g. departments, teams, project groups etc., or give recommendations on smoothing performance generation process on the basis of (virtual) performance units.

The detailed methodology and approach used to analyse, identify, optimising improvement process varies with an organisation's size, industry, culture, etc. There are several proven methodologies and supporting tools for deriving and improving optimised core operational process, e.g. Lean Six Sigma (Pepper and Spedding, 2010). However, there are other more type of methods, such as through expert's discussion, historical experience analysis, Soft System Method, etc. In Chapter 7, this study will summarise a common performance generation

process based on virtual performance units for a certain number of venture capital firms through literature review and interview, which is a new across organisations performance tree management.

3) Global coordination by rules and culture establishment

In a more general level, there is another global coordination approach for accomplishing an organisation's goals, that is rules and culture establishment for the purpose other than the implementation of particular processes. This approach is one of the classical management approaches in organisation management practice. Rules and culture establishment may not closely correlate with specific organisational objectives, yet they provide direct and critical support for the process of achieving these objectives. In other words, complying with rules and culture establishment by all the performance units will set up a desired working environment for the organisation to achieve its overall objectives. For example, in Lee and Yu's study on the relationships between corporate culture and organisational performance among Singaporean companies, they find the culture construction are used to enhance operations and organisational performance (Kim Jean Lee and Yu, 2004).

Specifically, rules and culture establishment can provide direct guidance for performance units and individuals, covering their day-to-day responsibilities that may outside their specific, work-related performance aims. It also provides critical supportive and collaborative mechanisms for achieving the pre-set objectives. In detail, it serves as guidelines for performance units and their individuals to carry out their local decision-making and activities in a constant manner, which are helpful to achieve the goals of the organisation.

The establishment of rules and culture could be in the form of policies, institutions, contracts, procedures, internal laws, rules of conduct, and mandates, etc. One classic example is the Deming circle/PDCA rule in management (Gartner and Naughton, 1988). It is an iterative four-step management rule used in business for the control and continuous improvement of processes, products and people. Apparently, the Deming circle/PDCA rule is neither a part of a specific objective nor a step of working/operational process for realising pre-set objectives. Yet, the performance practice indicates that it is a key prerequisite for continuous improvement of organisational performance (Qing-Ling *et al.*, 2008). To some extent, enterprise spirit cultivating also could be seen as one of this type of approach.

It should be noted that the rules and culture establishment in performance tree management is not as same as the classical one, because it should put more focus on the global dimensions to realise the organisational objectives supportively.

5.3.2 Global coordination by standardisation

In above global coordination method category, the objective/strategy decomposition and work process planning could become unpractical when the objectives and business process becomes very complicated or emphasising long-term impact, although they are wildly in performance management practice. For example, decomposing objectives and identifying core business operations may not work well even difficult in knowledge-intensive organisations, e.g. R&D institute, information technology companies, high-tech companies. In this sense, standardisation in the overall level could be another typical global coordination in performance tree management (Kellner, 2017). For example, Juntunen, Autere and Juntunen (2010) studied using a higher degree of standardisation to improve performance in the supply chain. The research shows that the standardisation leads to agility and further leads to better performance of the companies.

Here, the contents of standardisation are various, such as skill standardisation, expertise standardisation, output standardisation, input standardisation, operation process standardisation (Mintzberg, 1992), etc. Among them, skill standardisation is more common in performance management practices. The aim of skill standardisation as a global coordination method is to enhance the organisational performance by developing the competency of each performance unit. Mainly, there are two types of skill standardisation in practice. One concerns more about the individuals' capability in performance units, e.g. human resource management (Kellner, 2017), and another proposes right approaches of doing things, e.g. quality management (Asif and Searcy, 2014).

5.3.3 Global coordination by global mutual adjustment

Another role of global coordination is to ensure the smooth interplay of different performance units in the performance tree management. Therefore, global mutual adjustment is another important approach of global coordination (Claggett and Karahanna, 2018).

One of the mutual adjustments is achieved through developing motivation (Chromjakova, 2016). Suitable global motivation encourages staffs working harder and gives job satisfaction in the performance units, which keep their morale high. Moreover, smooth relationships between units and human are beneficial from promoting mutual adjustment.

Notable is, mutual adjustment as the global coordination for performance tree management, needs put the emphasis on encouraging performance units and individuals to work better for the overall benefit of the organisation, rather than motivating in the local level.

In fact, mutual adjustment has another critical function. When achieving organisational objectives become really globalised, the mutual adjustment could tend to become the primary global coordination in performance tree management. Reflecting in reality, this would be the network structure management for supply chain, strategic alliances, outsource companies (Gao, Li and Kang, 2018; Lin and Ho, 2018).

In this case, global coordination can be achieved by direct and mutual contact among the performance units. Direct inter-unit communications could bring about agreement on methods, actions and ultimate achievement. Moreover, specific methods can be developed for this type of mutual adjustment. For example, on the basis of soft system methodology (SSM) (Espinosa and Leonard, 2009), people could develop a method for balancing the interests of different performance units. The core process of this method is to adopt different forms of communication activities to formally or informally communicate with relevant (actual) performance units. The common methods often include questionnaire, surveys, interviews, formal or informal meetings, etc. The content of these communication activities mainly focuses on discussing three key issues: (1) What kind of objectives can reflect the common interests of every performance units? (2) What kind of goals and corresponding activities can prevent excessive damages to the individual performance unit's interests? (3) When conflicts of interest are inevitable, how should organisations formulate some suitable balancing strategies by modifying the goals? For example, Molleman and Timmerman (2003) found that, when the organisation’s key objectives are innovation and the creation of knowledge, the mutual adjustment, such as non-routine working processes among the individuals and teams, provides critical supports for achieving the desired organisational performance.

5.3.4 Global coordination by performance indicators and performance plan

In performance tree management, the organisation needs to enforce and confirm that either its performance units are going in the right direction or working synergistically. To this end, the organisation is required to know about the performance indicators(i.e. performance measurement) for measuring, managing and comparing the overall organisational performance (Liu *et al.*, 2010). In management practice, having too many performance indicators could be time and resources consuming. Therefore, organisations often use key performance indicators (KPIs), which are considered to be the most important measurement of the performance at different levels, instead of all performance indicators in their performance management.

KPIs are the vital navigation instruments used by organisations to understand whether their business is on a successful voyage or whether it is veering off the prosperous path (Marr, 2012). More specifically, KPIs is often a set of quantifiable measures that an organisation uses to determine how well it meets its declared operational and strategic goals (Schrage and Kiron, 2018). A right set of KPIs is believed as a valid management tool for enabling good performance planning and control, continuous performance improvement, resource allocation optimisation, staff engagement promotion and organisational objectives and strategies evaluation in performance management (Sinclair and Zairi, 1995). However, KPIs are a very broad and hard to grasp concept making the design of KPIs very difficult for both private and public sector organisation (Chan and Chan, 2004; Marr, 2012).

Collin (2002) advocated that the process of developing KPIs involved the consideration of the following factors:

(1) KPIs have to be designed focusing on the most important aspects of outputs or outcomes in line with organisational objectives and strategies.
(2) A set of effective KPIs must have a limited, manageable number of indicators, and they are maintainable for constant use in performance management.
(3) KPIs must be used collectively and systematically for achieving expected performance management results.
(4) Data collection must be simple, feasible as far as possible, and easy to be carried out in practice.
(5) KPIs and measurement methods must be understood, assigned and accepted throughout the organisation.

(6) KPIs will need a regular refinement and evolvement, especially when there is critical changing in the organisation, or the performance measurement feedback show demands of adjustment from staffs.
(7) Demonstrating KPIs could use visualisation methods, the charts need to be simple and understandable, and easy to update and accessible.

In most cases, top-down cascading KPIs (e.g. by BSC) from the pre-set organisational objectives/strategies is often seen as the process of setting the right KPIs for business units and teams to measure. One way is to hierarchically group KPIs into three connected levels, i.e. top-level, middle level and ground level. The top-level of KPIs often represents the measurement for the degree of achievement against pre-set organisational objectives. The middle level and ground level KPIs are often designed to diagnose detailed reasons for the underperformance in the top-level (Hofman, 2004). Another way is developing KPIs through another three levels, i.e. strategic level, tactical level, and operational level. Management in different level will deal with the corresponding level of KPIs (Gunasekaran, Patel and Tirtiroglu, 2001). When developing the top-down cascading KPIs (e.g. by SSM), the SMART criteria, namely Specific, Measurable, Achievable, Relevant, Time-bound, is often adopted as a useful tool (Parmenter, 2010). However, KPIs also can be extracted by the local units and teams in practice.

Moreover, there are many approaches to develop KPIs systematically. For example, Liu *et al.* (2010) proposed a 3E methodology for developing KPIs, which classify the outcomes of performance into three categories: efficacy, efficiency, and effectiveness. Often, most of the performance measurement tools, such as BSC model (Kaplan and Norton, 1992), Public Sector Scorecard (PSSC) (Moullin, 2009), Performance Prism (PP) (Neely, Adams and Kennerley, 2002), Performance Pyramid framework (PPF) (Lynch and Cross, 1991), can be used to develop or align KPIs. Specifically, the BSC model, introduced in 1992, revolutionise how organisations connected KPIs to its broader objectives and strategies through finance, customer, internal process, learning and growth four aspects and their logic links.

Nevertheless, in business, KPIs traditionally have had a retrospective bias by measuring past performance but offering little insight into how an organisation was likely to perform in the future. Hence, the performance plan (Armstrong, 2006) is often needed as it mainly concerns with providing a clear, structured process or guidance towards attaining a specified level of performance. Performance plan also could effectively make use of KPIs for the organisation to improve day-to-day operations and achieve strategic goals.

Performance plans are often developed between the supervisor and employee working together. They together determine the performance expectations, what needs to be accomplished during the review period for achieving the desired performance, and tactic are feasible to achieve the expectations. The contents of performance planning often include the individual's job responsibilities, the competencies required for doing the job, an appropriate performance and career development plan for the individual (Barth and de Beer, 2018).

In the Performance Tree Management Framework, the performance set is a carrier of a performance plan for conveying organisational objectives and measuring its performance. As defined in Chapter 4, the performance set of a performance unit consists of its specific goals and corresponding performance indicators. The feature of the performance set of a performance unit is that it not only contains the decomposed objectives of the organisation but also includes some selected local aims and performance indicators inside. In practice, to meet the pre-set performance targets, each performance unit will develop a performance set which includes the KPIs from the superior departments or global level and some local objectives. The manager of the performance unit often decomposes the KPIs and local objectives to his subordinate, e.g. working teams, staffs, to implement. However, these decomposed KPIs and objectives still can be further decomposed if necessary. While in performance evaluation, the organisation will measure the pre-set KPIs of the managers of performance units.

By this way, coordinative planning for performance management to realise the organisational objectives could be achieved.

More recently, the objectives and key results (OKRs) framework, conceived by Intel's Andrew Grove and popularised by venture capitalist John Doerr, has proven popular with tech companies as a performance plan tools to establish, communicate, and track organisation goals. OKRs is a collaborative goal-setting tool to set challenging, ambitious goals with measurable results. OKRs often work the same for setting goals and measure performance throughout the organisational level, department level and personal level. Specifically, OKRs define manipulatable success drivers of objectives (Niven and Lamonte, 2016). For example, if an organisation wants to increase its market share by 5%, OKRs process will clarify a number of driven objectives for achieving the pre-set objective. In this case, one of the driven objectives OKRs proposed might be "having an excellent customer service". Then, the corresponding key results could be the training of the call centre to reduce the waiting time by 10%.

Accuracy, the purpose of the OKR system is to ensure that every employee can move toward a common goal, and each employee can be accepted and coordinated by other employees. The OKR system is not as same as a performance appraisal system but seeks results that are conducive to the achievement of the goal based on communication. The KPI approach emphasises that pre-set results must be subject to the overall goal, and that a mandatory operation is to achieve these pre-set results. The key result of OKR is to serve the overall goal, so there is no need to pre-specify specific targets like KPIs and enforce them. Critical results are arbitrarily changed during execution, as long as the changes are still subject to the established project goals. Others features of OKR, such as being transparent to all employees, not linked to money, limiting the number of KRs, not needing to reach 100 points, and encouraging KRs to from bottom, make it a different global coordination approach from KPIs.

To develop OKRs, each level will establish its own OKRs. However, each level of OKRs often commits first to organisational objectives, so that teams and individuals can set their own objectives in service of those larger goals (Doerr, 2018).

Performance planning is regarded as a type of tool of global coordination in performance tree management because it has the aim of helping performance units and individuals reach their full potential with regard to achieving both local and organisational objectives. In other words, performance planning is about helping performance units and individuals to achieve their defined performance targets subject to organisational objectives.

5.3.5 Global coordination by feedback

Feedback is also global coordination for achieving and improving organisational performance. The most popular approach of feedback as global coordination is 360-degree feedback. The concept of 360-degree feedback is originated in the 1950s and 1960s for improving overall process and communication in organisational development (Waldman, Atwater and Antonioni, 1998). The “full-circle” 360-degree feedback model evolve and expand the original feedback approach that is reliant heavily on upward feedback. One of the critical benefits of utilising 360-degree feedback is that organisation can collect holistic information from its various stakeholder, including top executives, senior management staffs, line managers, colleagues, subordinates’ staffs, and every individual's self-assessment (Foster and Law, 2006). As the 360-degree feedback method is based on multiple feedback sources, people find higher quality

feedback is attained by this method. Moreover, this feedback method can increase higher coordination and facilitate the improvement of organisational performance.

Hurley and Snowden (2008) found that 360-degree feedback can increase communication, help employee development, and improve productivity and efficiency of organisational performance.

In the performance tree management, the feedback often via frequent and transparent communication, increased self-awareness, and clearer understanding of organisational goals and expectations, is particularly used to support and to adjust the other global coordination such as discussed above. Meanwhile, the feedback as a global coordination approach in the performance tree emphasises more on the global level, which is to give the organisation both positive and negative feedback about the implementation procedures of objective/strategy achievement and other global coordination approaches, if necessary. By this way, the organisation could take a look at its performance management related global coordination approaches from the perspective of units or department level, which could be used as a pretext for adjusting or strengthening its performance management methods in detail.

5.4 The significance of performance management tree framework

The Performance Tree Management Framework involves performance management structure and global coordination that can be developed both separately and in combination. As in practice, the methods of developing a performance management structure, that is the performance tree in the framework, and global coordination are very rich. Different combination of performance tree development and global coordination management can lead to various concrete performance management frameworks. More specifically, the Performance Tree Management Framework this study developed could not only be seen as a template for describing extant performance management frameworks and practices but also could help academics and practitioners develop innovative and flexible performance management approaches through understanding more of the core tasks in organisational performance management.

In fact, to talk of ‘developing a desired performance management system according to a performance management framework’ may itself be misleading, because the term ‘system’

seemed to imply too rational a perspective that far from the organisation and business management reality. On the contrast, the idea of the combination of management structure and different global coordination approaches in performance management that this study adopts in the Performance Tree Management Framework actually has been approved in the literature. As Otley discussed in his researches on performance management and organisational control, a performance management system can be seen as management approaches package, which different elements and approaches are added by different organisations under different contexts, rather than a desired impeccable management system (Otley, 1980; Otley, 1999).

The integrating platform both for research and practice provided through the Performance Tree Management Framework is comprehensive and adaptive, and could go well beyond the traditional boundaries of action-oriented performance management.

First, the performance tree management still concentrates on understanding the organisational structure and core operational activities of the organisation by developing performance tree. Attempting to design performance management systems without having a detailed knowledge of how the organisation and business works are likely to produce a recipe for disaster.

Second, there is a need to connect performance management systems design with issues of global coordination, both top-down and bottom-up, even other forms. Performance management systems need to reflect the aims of an organisation and the harmonious coordination of different units that have been developed to achieve those aims.

Third, there is a need to focus on the broader causal factors, such as the external context within which the organisation is set, rather than just being concerned with internal activities. A process orientation that focuses on wider managerial mechanisms could be required to complement the action-oriented approaches that have long dominated the literature.

In the following sections, some possibilities of management structure and global coordination in performance tree management are discussed, either by the existing performance management frameworks or by new proposed innovative performance management frameworks.

5.4.1 Some existing performance management frameworks

The existing performance management frameworks can be categorised into at least two types depending on their starting point. One type is start from an organisation’s objectives/strategies,

while another is a universal operational model for a group of organisations (Zheng *et al.*, 2019)**.** Below some of the representative performance management frameworks as examples are used for the discussion.

Type one: Performance management frameworks starting from an organisation's objectives/strategies

- **The BSC model**

First Generation Balanced Scorecard was initially described as a simple four box-measures, combining financial and non-financial indicators with the four perspectives, i.e., financial, customer, internal business process and learning and growth, to performance measurement (Kaplan and Norton, 1992; Valmohammadi and Sofiyabadi, 2015). It is actually a measurement system without cause-and-effect logic.

Second Generation Balanced Scorecard links the four measurement aspects to the organisation's vision and strategy by strategy map, which put emphasis on the cause-and-effect relationships between measures and strategic objectives (Kaplan & Norton, 2000). Strategy map, cascading and aligning objectives, and cause-and-effect relationship are three basic components in the BSC model (Kádárová, Durkáčová and Kalafusová, 2014). Hence, the improved BSC model becomes a strategic performance management tool, in which the strategy map is usually utilising to illustrate the linkage between organisational strategies and performance measures for further strategies decomposition process (Valmohammadi and Servati, 2011).

Third Generation Balanced Scorecard adds two new components, i.e. destination statement and Strategic initiatives, into the last type of BSC model, which intends to help organisation achieving systematic, methodical implementation of its strategies (Cobbold and Lawrie, 2003; Abdel-Kader, Moufty and Laitinen, 2011). A destination statement is a kind of planning about where an organisation wishes to be and how to realise in a specific time horizon, while the strategic initiatives are projects that are designed to help the organisation achieve its targeted performance.

The three generations of BSC models are very classic examples that can be analysed and examined by the Performance Tree Management Framework. It can be seen that the BSC models do not focus on improving or adjusting the existing management structure, which means it always takes the existing organisational chart as management units for performance

management. From the perspective of performance tree management, the BSC models adopt the existing organisational chart and departments as performance tree and performance units.

And then, the BSC models utilise or develop a series of management techniques to impel all the management units to achieve the organisational strategies synergistically, e.g., proposing a set of four performance measures for developing KPIs in the first generation BSC model, decomposing strategies by the proposed causal logic and strategy map in the second generation BSC model, planning the implementation of strategy in the third generation BSC model (Zhang and Gwizdka, 2014). All the above management techniques actually could generate global coordination mechanisms in the processes to achieve the pre-set organisational objectives.

By the above analysis, this study argues that the BSC models can be underlain by performance tree management formulation. First, the existing organisational chart is adopted as a performance tree for further performance management. After that, when the KPIs is used as the global coordination approach, then this performance tree management model is of high similarity with the first generation BSC model. If the objective/strategy decomposition is further added as extra global coordination approach into the above performance tree model, then it will very much like the second generation BSC model. In the same way, further adding the global coordination approach performance plan could be very similar to the third generation BSC model.

- **The BSM model**

In addition to the BSC models, other sorts of scorecard performance management models, such as PSSC, BSM (be reviewed in Chapter 3), etc., could be similarly underlaid by Performance Tree Management Framework. The main distinction among them is that they use different global coordination approaches. Here, the BSM model is discussed as another example.

The BSM model is a performance management framework designed for public sectors and non-profit organisations. This framework proposes the importance of balancing different key stakeholders' interests in organisational performance management. The key method of this framework is first to identify the organisation's key stakeholders, then to ensure and balance their varied interests as far as possible throughout the performance management process. The BSM model grasps one of the main features (stakeholder interests oriented performance) in public sector performance management and provides systemic and detail guidance for performance management implementation in public sectors and non-profit organisations

(Zheng *et al.*, 2019). As this study discusses above, the BSM model develops an approach for identifying the key stakeholders and then balancing their interests. This newly developed approach associating with strategy decomposition constitutes the BSM model.

Hence, the BSM model can be presented as a specific performance tree management model, in which taking the existing organisational chart as performance tree and using strategy decomposition and new developed balancing key stakeholders' interests approach as global coordination methods.

- **Otley's five questions performance management framework**

The Otley's five questions performance management framework is another classic framework that starts from organisational strategy (details can be found in Chapter 2). This framework can provide a structure for examining extant practice in a more holistic way (Otley, 1999). However, it still can be interpreted by and mapped to the Performance Tree Management Framework. An overall summary of the mapping between the Otley's five questions and Performance Tree Management Framework is given in Table 5-4 below.

Table 5-3 Mapping Otley's five questions with the Performance Tree Management Framework

	Performance tree development	Global coordination approaches
Question 1 concerns with the definition of organisational goals and the measurement of goal attainment.	Not addressed	1. Objective decomposition 2. Performance indicator set 3. Feedback
Question 2 represents the codification of the means by which objectives are intended to be attained.	Not addressed	1. Improvement process plan 2. Rules establishment
Question 3 is about setting appropriate performance targets	Not addressed	1. Performance indicator set 2. Performance plan
Question 4 considers how to ensure performance targets achievement.	Not addressed	1. Performance plan 2. Mutual adjustment

Question 5 is about information feedback and competitive power enhancement via building "learning organisation".	Not addressed	1. Feedback 2. Rules and culture establishment 3. Standardisation

It can be seen that in the Performance Tree Management Framework's terminology, the Otley's five questions are mostly about how to deal with global coordination in performance management, which could almost involve all the global coordination approaches that have been discussed above. However, to some extents, this study believes that the Performance Tree Management Framework could provide a more flexible structure for performance management than the Otley's, as the new framework adds performance tree and performance units development in it as the footstone, i.e. management structure, for carrying out performance management, yet the Otley's does not address this issue.

Type two: Universal Performance management frameworks for a group of organisations

- **EFQM excellence model**

Performance management framework with a universal operational model for all organisations is another popular type framework that does not start from specific organisational objectives/strategies. The representative frameworks are the EFQM excellence model (EFQM, 2013) and the MBNQA Excellence Framework (MBNQA,2007) (details can be seen in Chapter 3). These types of performance management frameworks also can be analysed by and mapped into the Performance Tree Management Framework. Here, the EFQM excellence model is analysed as an example.

Different from the first type of performance management frameworks that adopt the existing organisational chart as performance tree, the EFQM excellence model's performance management approaches are not necessarily conceptualised on the basis of the existing departments. Instead, it sets up five key enablers units, i.e. leadership unit, strategy unit, people unit, society unit and process unit, for its approach. From the perspective of performance tree management, they are mostly virtual performance units. These performance units often cannot find their corresponding counterpart departments in a real organisation. Therefore, to implement the EFQM excellence model, an organisation needs to map the proposed approaches to the teams or individuals scattered in different departments. Based on this

management structure, the EFQM excellence model proposes three main types of global coordination approaches, i.e. plan–do–check–act (PDCA) method, benchmarking and standardisation, to manage organisational performance. PDCA is a management process that involves performance plan, performance indicators, feedback. Benchmarking is, to some extent, similar to the improvement process planning. The standardisation methods in the EFQM excellence model is more complicated and detailed, which represents a series of managerial principles and approaches (see Table 5-5). However, it can be seen that all these managerial principles and approaches all are the specific cases of global coordination in the Performance Tree Management Framework.

Table 5-4 Detailed standardisation contents for global coordination in the EFQM excellence model

Managerial principles	Detailed standardisation contents for global coordination
Adding value for customers	1. Process Management System (e.g. ISO9001) 2. Process Improvement (e.g. Six Sigma) 3. Research and Development 4. Marketing Activities 5. Customer Satisfaction Surveys 6. Customer Service and Relationship Management 7. Customer Contact process
Creating a sustainable future	1. Environmental Management Policy 2. CSR (Corporate social responsibility) Policy 3. PESTEL (Political, Economic, Social, Technological, Environmental and Legal) Analysis 4. SWOT (Strengths, Weaknesses Opportunities, Threats) Analysis 5. Communicating Strategy
Developing organisational capability	1. Standard Procurement Policies 2. Partnership Policy and Guidelines 3. Research and Development 4. Communicating Strategy 5. Process Management System (e.g. ISO9001)
Harnessing creativity and innovation	1. Benchmarking Strategy 2. Knowledge Management 3. Marketing Research and Analysis 4. Objectives Setting, Training Plans and Appraisals
Leading with vision, inspiration and integrity	1. Vision, Mission and Value statements 2. KPI Report and Review Meeting

	3. Leadership Competencies and Development 4. Management Meetings 5. Stakeholder Meetings 6. Strategic Planning Process
Managing with agility	1. Process Framework Defining and Mapping 2. Process Ownership Defining 3. Process Improvement Methodology 4. Change management 5. Research and Development
Succeeding through the talent of people	1. Employee Appraisal 2. Employee Engagement Survey 3. Competencies and Job Descriptions 4. Objectives Setting, Training Plans and Appraisals 5. Internal Communications
Sustaining outstanding results	1. Annual Report/Sustainability Report 2. Balanced Scorecard 3. Target Setting Process 4. SMART (Specific, Measurable, Achievable, Realistic, Timebound) objectives 5. Business Planning Process 6. Balancing Stakeholder Needs

Moreover, other types of existing performance management frameworks also could be analysed and examined by the Performance Tree Management Framework. For example, the high-performance work system (HPWS) (Paauwe, Guest and Wright, 2013), can be seen as a function-oriented performance tree with actual performance units, further associating with global coordination focusing on individuals, such as performance planning, skill standardisation, operation process standardisation, motivation and feedback. Even more, the work of the business processes reengineering (BPR) is actually developing performance tree with recreating new performance units over the existing departments by optimised business processes (Motwani *et al.*, 1998). However, the BPR does not provide how to manage the optimised process in detail, which could be improvement process planning etc. This analysis could be a possible explanation for why some people do not agree the BPR is a performance management model, as it misses the key performance management elements, namely managing by global coordination.

Based on the above discussion, this study finds that most of the existing performance management frameworks can be mapped to the Performance Tree Management Framework. Moreover, people can create innovative performance management approaches by combining different performance tree development techniques and global coordination methods based on the new framework. Furthermore, this study understands that there could be more methods to develop performance units, performance tree, and coordinate them globally. This means that the Performance Tree Management Framework could offer extensive possibilities for the performance management system designing and managing.

5.4.2 Propose some new performance management frameworks

1) BSC model combines with the PDCA method

The original BSC model does not provide the organisation with the process on how to achieve and enhance the decomposed organisational objectives in the department or individual level. To improve the BSC model, people could add the PDCA method into it as an implementation process for continuous improvement of all level of performance.

The related Performance Tree Management Framework could be, adopting the existing organisational chart as a performance tree with actual performance units, then managing this tree with global coordination, in which the most is objective/strategy decomposition and PDCA method.

2) Performance tree with virtual performance units combines with global coordination focusing on non-behavioural factors.

In some situations, performance management often hard to predetermine the actions and processes for achieving pre-set organisational objectives, for instance, when performance management is carried out in a knowledge-intensive organisation, such as an R&D institute, a university, or the performance management is to achieve mid-and-long term objectives. To design an effective and flexible performance management system in that case, people can apply the Performance Tree Management Framework.

The idea could be three parts. The first part is to develop a performance tree with or partly with virtual performance units, according to a specific management logic or a generic operation process aiming to achieve organisational objectives. As this performance tree does not exactly follow the detailed activities or processes in the organisation, the global coordination approach

to manage this performance tree would focus on non-behaviour aspects, such as policy, regulation, culture, instead of managing action and process directly. Therefore, the second part is to develop policy, regulation, culture as global coordination for performance tree management according to the real business and management context of the organisation. The third part is to develop KPIs and performance plans for monitoring and assessing the designed performance management system. Moreover, in this way, this study believes that the Performance Tree Management Framework could be used to design a performance management system for a group of organisations who have common objectives and core operation process in general. This study will discuss and attempt this type of Performance Tree Management Framework in detail in the case studies.

5.5 Preparation for implementing performance tree management

Before actually developing and managing performance tree for an organisation, some indispensable preparation work should be carried out, which will provide a good foundation for implementing the performance tree management successfully. The content of an initial stage work includes three aspects.

First, to set up a dedicated team (hereinafter referred to as “the team”) for organisational performance promotion.

Second, to gather comprehensive information about the existing objectives, strategies, organisational structure, internal conditions, external environment, and various applied management methods, etc.

Third, to view and diagnose the effectiveness of existing organisational management system from the perspective of performance management.

However, above is only the skeleton of the earlier stage work for the implementation of performance tree. The actual work will be a miscellaneous and detailed process. But no matter what, the situation and issue of the organisation should be identified by this process.

Based on the aim of performance promotion project and the mechanisms of performance generation with its network, the result of the earlier stage work can be theoretically included into four types of scenarios for further actions:

The first scenario is that the management system and structure/chart in the organisation are in high concordant and effectiveness for the organisational objectives and strategies. Thus, there is probably no need to improve organisational performance systematically. The team may just give limited advises for performance enhancement locally.

The second scenario is that the management system and structure/chart in the organisation are concordant and effectiveness to some extent and, the organisational structure/chart is fully justified by the organisational objectives and strategies. Yet, the key issue is that the existing performance management system is somewhat uncoordinated. In this case, the team may regard the existing organisational structure as a performance tree instead of creating a new one for the organisation and, the priority of the future work is to improve the global coordination of the management system for achieving effectiveness of performance management processes.

The third scenario is similar to the second one, yet there exists further issue that the structure/chart of the organisation is locally unsuitable for its objectives and strategies. Therefore, the team needs to create/adjust some performance units for developing a more appropriate performance tree for the organisation in addition, which mean there will be a structural adjustment or departmental change in the implementation of performance tree management.

The fourth scenario is a relatively rare situation for the organisation, which the existing performance management system and organisational structure/chart are mostly uncoordinated and ineffective. The team needs to redevelop both the fundamental organisational structure and the key business process with its corresponding performance management approaches for enhancing the organisational performance. Otherwise, the organisational objectives and strategies need to be converted to suit the present situation of the organisation. However, these managerial activities could extend far beyond the scope of performance management. Thus, they are not going to be discussed in this study.

In a real case, the diagnostic results of the initial stage work of applying performance tree will be more complex, the broad categories of four scenarios can help people to apply the performance tree management more effectively.

After the initial stage work for the application of performance tree management, the team will decide whether to develop a specific performance tree for further partially structural adjustment and performance management or to establish/enhance particular global coordination for

improving organisational performance or take above actions in both ways for integrated performance enhancement.

Chapter 6 Case Study of SW Institute

6.1 Case summary

SW Institute (SWI) is a new type of international innovation centre, namely innovative functional platform (IFP, to be reviewed below), jointly established in 2013 by the Shanghai Institute of Microsystem and Information Technology (SIMIT), Chinese Academy of Sciences (CAS); and the Jiading District Municipal People's Government of Shanghai, http://www.sim.cas.cn/shwjsgyyjy/). SWI is devoted to innovative research and development on "More than Moore" (MtM) technology (Wu *et al.*, 2017), generic technologies of sensor industry and sensor-based Internet of Things (IoT) ecological system (Sethi and Sarangi, 2017), ultimately to establish a world-class sensor development and production site. Besides, SWI aims to be a global collaborative innovation centre, integrating R&D, engineering services and business incubator that can provide a full range of services and solutions for innovative companies and other partners (*Homepage - SITRI*, 2019, http://www.sitrigroup.com/).

In 2016, Shanghai Municipal Government approved the SWI as one of the main pillars in the project of building Shanghai into an influential global innovation centre in science and technology (Sci-tech) and later listed it as one of the first IFPs in Shanghai for Sci-tech research, development and transmission.

As one of the regions with the most robust innovation capability and the best industrial development in China, Shanghai government hopes to accelerate the growth of micro-technical research and generic technology by cultivating a group of world-class IFPs, then to establish a solid scientific and industrial foundation for economic transformation and upgrading through innovation (SITRI, 2017, http://www.sitrigroup.com/news/20170910/).

After years of construction and development, SWI has entered an accelerating growth period since the end of 2018. To cope with the development of the organisation, SWI intends to progress its overall management, which includes the current performance management system. SWI finds that the existing performance management system has achieved most of the short-term organisational goals, yet seems inadequacy for realising the mid-and-long term organisational objectives, especially the social impact objective. To improve the SWI's

performance management, especially for achieving significant and desired social impact, the institute invites us to carry out a performance management diagnosis and improvement project thereon. SWI mainly wishes to enhance and consolidate its existing performance management system and to achieve its social impact objective. In this performance management improvement project, we have used the new Performance Tree Management Framework as an underlying footstone.

6.2 Background of Innovative Functional Platform

The Shanghai Municipal Government firstly proposes the concept of IFP, which poses new requirements to the SWI's operation and management. We find the IFP has a different nature from other existing relative concepts, e.g. Innovation Centre, Innovation Hub, R&D Department, Innovation Incubator, etc. Hence, we believe we must understand the issues of what the IFP is, what is its features, what kind of theories and models have been used for managing the IFP's performance.

6.2.1 What is Innovative Functional Platform

With the increasingly fierce competition in Sci-tech around the world, innovation has become the core driving force for maintaining the country's prosperity and sharpening competitive edge in the worldwide. Nowadays, the transformation ability of Sci-tech is believed as one of the manifestations of technological competitiveness, which is also considered as one of the criteria for measuring the comprehensive competitiveness, both from the enterprise level and national level (Meng and Song, 2019). Under such a circumstance, the Shanghai Municipal Government first proposed the concept of IFP for Sci-tech research, development and transmission in its Sci-tech development program (Nature Index 2017 China, 2017).

According to Shanghai's 13th Five-Year Plan for the Scientific and Technology Innovation Development, Shanghai will develop 30 IFPs by the end of 2020. In 2018, the first group of established 18 IFPs were listed by Shanghai Municipal Government, which include the SWI, Shanghai Industrial Technology Centre of Graphene, Shanghai Integrated Circuit Research and Development Centre, Shanghai Centre of Biomedicine Development, Shanghai Manufacturing

Innovation Centre of Intelligent Manufacturing and others. In terms of their development modes, the organisation and construction of Shanghai's IFPs are led by the local governments, and the further development of IFPs will utilise the market-oriented management and operation mode (Shanghai Municipal Government, 2016).

The IFPs based on different Sci-tech innovation and R&D institutes have different nature and can be classified explicitly into different sub-categories (Zhang, Zhou and Ren, 2018), which give us a more detailed understanding of them.

1) From the perspective of the ownership, the IFPs can be divided into government-oriented platforms, enterprise-oriented platforms, third party-oriented platforms, and composite platforms.

2) From the perspective of the platform's body's nature, the IFPs can be divided into actual platforms and virtual platforms. The virtual platform is much more like an association for a group of Sci-tech innovation and R&D institutes.

3) From the perspective of platform's primary functions, the IFPs can be divided into the IFP focusing on research and development (IFP-R&D), the IFP focusing on Sci-tech transformation (IFP-Tran) and the IFP focusing on Sci-tech service and support (IFP-Svc). The details are presented in Table 6-1. This type of classification of IFP seems more practical for researching and management practices.

The IFP-R&D mainly focuses on basic research, applied research, experimental development and other activities, and engages in the research and development of Sci-tech, which leads to the continuous emergence of innovative behaviours, promotes the joint development of relevant parties, and finally produces new technologies and new products.

The primary functions of IFP-Tran are to develop, apply and promote scientific and technological achievements and innovation projects mainly by the process of commercialisation and marketisation, and finally to facilitate the achievement of regional economic transformation.

The IFP-Svc mainly provides technical services around the process of science and technology research, development, transformation, marketing, and industrialisation techniques, such as preliminary test or reliability testing for the newly developed technologies or products.

Table 6-1 The classification of IFP by functions

Platforms	Classifications	Forms	Functions
The innovative functional platform for Sci-tech research (IFP)	IFP focusing on research and development (IFP-R&D)	Enterprise R&D Centre, key laboratory, Scientific and technological cooperation platform, Engineering Technology Research Centre, Scientific Research and Technology Development Institution, post-doctoral research station, Incubation Centre, etc.	Basic research and application research, generic technology research and development, innovation, new technology and new products development, etc.
	IFP focusing on Sci-tech transformation (IFP-Tran)	scientific and technological achievements displaying and trading platform, innovation demonstration area, Sci-tech transformation base, Sci-tech Park, etc.	scientific and technological achievement commercialisation, promoting new business types and new industrial operation pattern, Promoting regional economic transformation, etc.
	IFP focusing on Sci-tech service and support (IFP-Svc)	Research and development service and training centre, generic technology service platform, engineering service platform, incubation service hub, information resources sharing centre, innovation investment and financing platform, Innovative ideas exchange interactive platform, Talent for Sci-tech transformation training centre, supervision platform, experiment equipment and testing instruments centre, etc.	new technology validation and demonstration, new technology popularisation, incubator service, financial service, data and information service, Policy advisory services, Market development service, etc.

Moreover, the Shanghai Municipal Government endues the IFP with important social functions. Specifically, the IFP is emphasised not only on gathering and sharing Sci-tech resources and innovation, but also the responsibility for promoting industrial generic technology research and development, reducing industry innovation costs and helping to boost the economic efficiency and social benefits.

In terms of the IFP's core operations, the IFP uses its independent technology and service advantages to promote the application and transformation of the Sci-tech R&D achievements, to lead the development of the specific industry, to obtain economic returns, and finally to

realise its hematopoietic function and sustainable development (Shanghai Municipal Government, 2016).

Accordingly, SWI is a government-oriented actual platform and, has integrated functions of R&D, Sci-tech transformation and Sci-tech service and support.

Moreover, there are commons and difference between the IFP and Innovation Centre/Innovation Hub. Specifically, both of them can be seen as a carrier of Sci-tech innovation and transformation, yet the former places more emphasis on its public service attributes, which are mainly manifested in promoting industry-leading technology and economic development and benefiting society. Therefore, the governments who have invested the IFP often have clear target expectations and assessment requirements for the platform. In most cases, the governments expect the IFP to develop innovative technologies and effective industrialisation further to gain a significant and positive social impact. Furthermore, the results of the performance assessment will affect the amount of governments' future investing funds to the IFP (Li and Luo, 2017).

6.2.2 Some relevant research of the IFP

Compared to the existing similar concepts, such as Innovation Platform/Hub (Goffin and Mitchell, 2016), R&D (Hsu, Lien and Chen, 2015), the majority part of relevant researches are in the Chinese context or being conducted in China, as the IFPs mostly exist in China.

In terms of operation and management of IFP, very few pieces of literature have been conducted so far to study its characters and operational mechanisms. For example, Xia (2014) and his colleagues compare the IFP's collaborative innovation modes and operational mechanisms with those of the traditional R&D institutes. They find that the new institutes of the IFP often carry out the dean responsibility system in their operation and management under the guidance of directorate that has the de-administrative nature. Meanwhile, the intensive collaboration of government-industry-university-research in China ensures high efficiency and high output on innovation and transformation activities of Sci-tech development (Xia *et al.*, 2014).

Zhang (2016) proposed that the IFP is a network of accumulated organisations that often has a core institution with strong influence in a specific industry, and whose aim is to fulfil the needs of integrating of the industry chain and innovation chain. The functions of IFP are mainly

reflected in the overall coordination and efficient utilisation of resources between different entities in the platform, such as the researching and developing the generic technology according to the needs of industrial development, overcoming the weakness of the transformation in scientific and technological achievements, and enhancing the platform's influence on the corresponding innovation chain, industry chain and service chain. Later, in the study of the IFP's construction and operation mechanisms in Shanghai, Zhang, Zhou and Ren (2018) identified three core operative features of IFP, which are cooperative linkage, open integration and service-oriented.

Based on the existing literature, we believe the development of IFP strongly depends on multiple participants and the resources that they bring through close cooperation. The efficacy of the IFP mainly comes from realising the coordinated and efficient use of resources of different participants through providing high-quality services.

6.2.3 The existing performance management of the IFP

As the IFP is a newly raised concept in China, there are relatively few studies on its performance management in Chinese literature. The existing relevant studies are all concentrated on performance evaluation and performance appraisal. Similarly, we have not found public reports that systematically describe performance management practices or cases in China.

Li (2014) argued that R&D and transformation functional platforms are based on the cooperation of multi-stakeholders. Therefore, the platform's performance management should balance the key stakeholders' interests. From this, he proposes a stakeholder satisfaction-oriented Performance Prism can be used for the platform's performance management practice.

Apart from the research literature, the Shanghai Municipal Government issued a series of policies on IFP's development and management. The contents of these policies relating to IFP performance management are all about performance assessment. Specifically, the Shanghai Municipal Government manages its invested IFPs' performance landing a government contract. In general, a government contract often clarifies on IFP's goals, contents, governments financial investment plans, and performance evaluation approaches and indicators. The evaluation outcomes are directly linked to governments' financial appropriations and determine the level of follow-up supports and funds. In general, the Shanghai Municipal Government's

performance evaluation of the platform focuses on whether the platform can become an important hub and node for international, cross-regional, and innovative cooperation networks, and achieve significant and positive social impact. The full contents of social impact objective could be extensive. The main scope of social impact often embodies in supporting governments' important programmes, helping enterprises innovation, serving communities and people, scientific knowledge popularisation, realising economic benefits (Meng and Song, 2019).

Further, the performance management practice of the Interuniversity Microelectronic Centre, Belgian (IMEC), the SWI's selected benchmark, is reviewed by us. The IMEC is founded in 1984 as a non-profit organisation based on the local government's program. The institute is supervised by a Board of Directors, which includes delegates from industry, local universities and local government. It has developed rapidly in the fields of nanoelectronics and digital technologies and has become one of the most successful microelectronics research centres in the world. In terms of its performance management, the local government gives IMEC a higher degree of freedom, and only evaluates the performance results without intervening in operational processes. The performance management mainly adopts an operation KPI assessment approach, such as assessment articles, patents and local industry contributions as cooperating with local industries (Florence, 2019).

Through the review, we find that the performance management research and practice about the IFP is almost in an initial phase. There is no mature and effective performance management model can be systematically applied for the IFPs.

6.3 Preparation of the project

As mentioned at the beginning of this chapter, we have reached an agreement on the contents of this performance management improvement project with the SWI, which is mainly to develop performance management approaches for the enhancement and consolidation of their existing performance management system and to achieve the objective of social impact by utilising the new Performance Tree Management Framework. In other words, we are not going to develop an entirely new performance management system for SWI, but will propose a set of performance management approaches that can be integrated into the SWI's existing performance management system for achieving its social impact objective.

After understanding the background of the project, the next step of our project is to collect management related information of SWI for further analysis. Therefore, we carry out semi-structured interviews with the relevant persons that include top managers, human resource managers, project managers and core R&D staffs in SWI, and collect the update information about its organisational structure, established objectives and strategies, and the performance management practice, etc.

The questions of the in-depth interviews focus on the mid-to-long term strategies and objectives, managerial procedures, and existing managerial issues. The questions are asked mainly as:

- What are the organisational objectives and strategies of SWI?
- What are the key objectives for your department/team?
- Could you briefly describe the key procedures of accomplishing an R&D/transformation project?
- What are your department/team's main collaborators?
- How do the departments/teams collaborate?
- What is the existing performance management system, and how is the performance evaluated?
- How is the social impact objective achieved, and how does your work link to it?
- What is vital for achieving a positive social impact?

Meanwhile, the secondary data are collected as well in this stage from the internet, industrial documents and government report, to support us to form an overall picture about the status and issues in the performance management of SWI.

The essence of this stage is to collect enough data and gain enough knowledge to conduct a detailed analysis of the performance management related issues of SWI. By analysing these data, the situation and issues about performance management of SWI are identified in the next sections.

6.4 Current performance management in SWI

6.4.1 The overview of SWI

1) The organisational structure of SWI

The organisational structure of SWI is generally composed of the board of directors, the president's office, the expert advisory committee, and the various subdivisions (see Figure 6-1). The board of directors is the body that makes decisions, which mostly formulate the organisational objectives and mid-and-long term strategies. It is composed of the representatives of the Shanghai Jiading District Government, representatives of the SIMIT of the Chinese Academy of Sciences, relevant enterprise representatives and industry experts. The President (Dean) is responsible for the management of daily affairs and reports to the Board of Directors on a regular basis. The expert advisory committee provides advice on organisational strategies formulation and implementation.

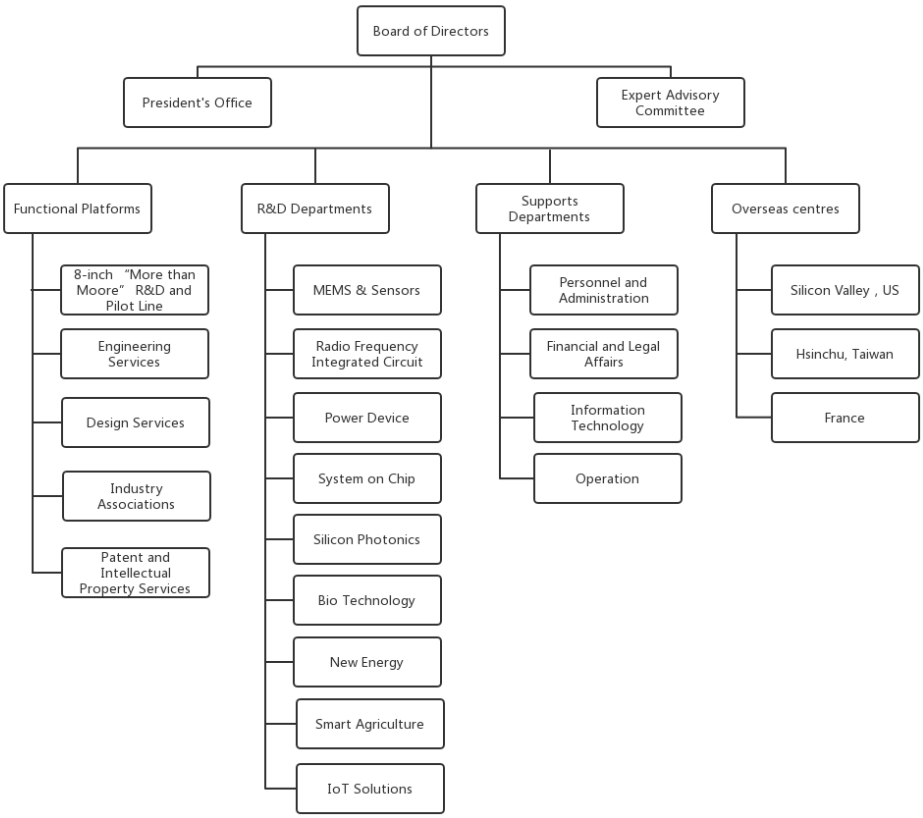


Figure 6-1 Organisational chart of SWI

2) The functional platforms in SWI

In SWI, the R&D departments, supporting departments, overseas centres and functional platforms together constitute its core operational body. Among them, the R&D departments mostly propose and exam the technical research and development directions for the Sci-tech development and transformation projects according to the specific industrial development trends. The support departments are mainly responsible for the execution of daily affairs, recruiting talents and provide operational services for other departments. The overseas centres mainly refer to the global innovation network, including Silicon Valley, France and Hsinchu. These centres aim to help international innovation enterprises to quickly enter the Chinese market and find their key industry chain partners and to establish cooperation agreements with international R&D institutions to rich the Sci-tech resources for Shanghai microelectronic industry.

Most importantly, the functional platforms therein are the key operational parts of SWI, which provide a complete ecosystem of resources, services and expertise to support a wide range of IoT technologies, markets and applications. Specifically, there are five functional platforms in SWI:

- 8-inch “More than Moore” R&D and Pilot Line. SWI’s initial micro-fabrication capabilities include a 200mm “MtM” R&D pilot line located in Shanghai. The line features over 5000 square meters of cleanroom space, more than 100 installed tools for wafer processing and packaging, and an established suite of micro/nano process flows. The line is compatible with the production capabilities of SWI’s foundry partners to assure seamless transfer from R&D to mass production. It is an integral part of SWI’s micro-fabrication consortium which enables the comprehensive integration of MtM development and a rapid transition to mass production, all within SWI’s ecosystem environment.
- Engineering Service platform. SWI offers a wide range of expert engineering services to help start-up companies in developing their products by a more holistic, coordinated engineering approach. Moreover, this platform is also able to provide an integrated environment that can more efficiently facilitate filling critical gaps in technology commercialisation results. The engineering services include Technology Analysis Services, Testing Services, Patent and intellectual property (IP) Analysis Services, Facilities and Capabilities.
- Design Services platform. SWI's design Service focuses on designing low-power circuits with the needed circuitry for sensor interface, and embedded logic for better wireless

connectivity at a lower total cost, in order to achieve analogue, digital, Radio Frequency (RF) and Microelectromechanical systems (MEMS) to work together to interface with the real world, and finally aims to be extended to production engineering including back-end package and test design and project management.

- Industry Associations. Leveraging a central role in the electronics industrial base, SWI works to address materials, fab, process, package, test and industrial design need across the entire supply chain. In detail, SWI has set up two industry associations. The first one is the Sensors and IoT Industry Association, which is a technology innovation alliance formed by SW institute with the guidance of China's Ministry of Industry and Information Technology. Its association members include (1) scientific research institutes and universities, (2) product design companies, (3) foundry, assembly and test houses, (4) system integration and industry application firms, (5) capital and industrial funds. The second one is "More than Moore" Industry Association, which is with guidance and supports from various national government departments and the Shanghai Municipal Sci-tech Commission. It mainly focuses on MtM technical fields to advance the development of core industries and promote the integration of diverse technologies by integrating the upstream-midstream-downstream vertical system and horizontal application resources of the MtM industry.
- Patents and intellectual property (IP) Services platform. This service platform aims to provide help for evaluating and promoting patents and IP of R&Ds and innovative enterprises. Furthermore, it also can help to increase the market value of those companies' patents.

We can see that all the functional platforms are set for achieving the industrialisation objectives. In detail, industrialisation is mostly project-based and often involves finding talents and projects through various channels, establishing a business unit (relatively independent unit), and setting up an internal research and development fund (seed fund) to promote technology transformation and industrialisation. In terms of the equity allocation of a particular project, the SWI often accounts typically for about 20%, and the project team takes about 40%. The proportion of investors' shares can be negotiated with the project team. The functional platforms of SWI mainly provide guidance and support at different stages of an industrialisation project.

6.4.2 The generic Sci-tech transformation operational process in SWI

Through the interview, we clarify the generic Sci-tech transformation operational process in SWI, which will be utilised in the succedent performance management improvement system design. The Sci-tech R&D and transformation operation is mainly composed of five key processes: resource docking, technology sharing, knowledge learning, integrating and transforming and technological innovating (see Figure 6-2). These five key processes form a progressive relationship, that is a chain of resource flow processes. The operation based on this progressive relationship and gradually transforms scientific and technological achievements into innovative applications. Therefore, to clarify this process is the prerequisite for effective coordination and cooperation of all parts/stakeholders in the platform management. Then, the platform support service system should be designed and developed on the basis of this process.

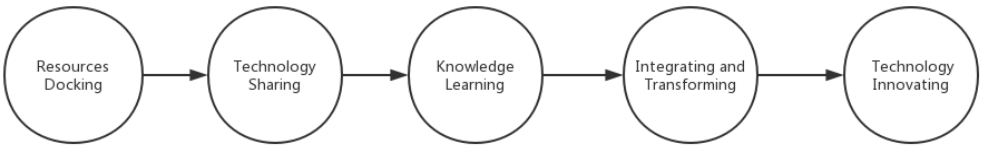


Figure 6-2 The Sci-tech R&D and transformation operational processes

Besides, the platform's operation process is not just a simple linear one-way process, but a cyclic process with a positive feedback mechanism, so that the platform can achieve continuous performance improvement (see Figure 6-3). Through the operation chain, more new scientific research achievements and transformation results the platform achieves, more external resources it acquires, which further enhances the internal research and transformation capabilities of the platform, thus making the next stage of the research and transformation process more efficient.

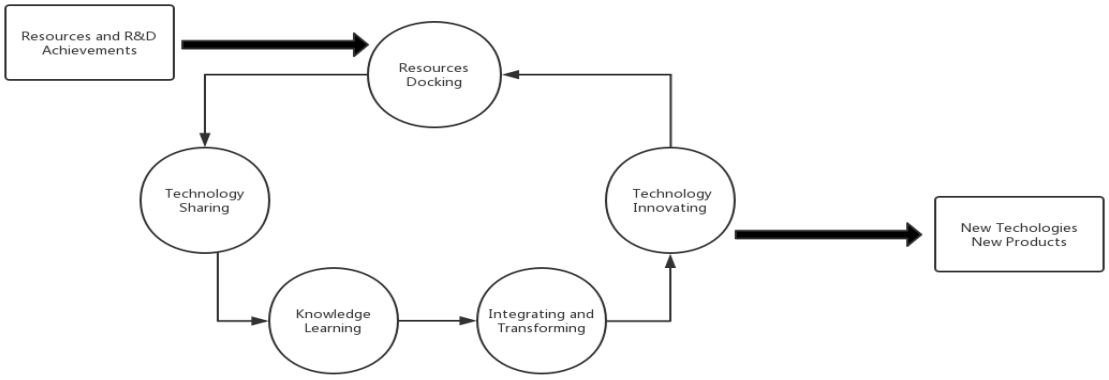


Figure 6-3 The cyclic Sci-tech R&D and transformation operational processes

6.4.3 The objectives and strategies of SWI

1) The SWI's organisational objectives

The SWI devotes itself to scientific research and Sci-tech achievements transformation activities intending to realise desired social and economic benefits. Hence, the SWI establishes a complex objective system that has three levels: short-term, medium-term and long-term.

The short-term objectives of the SWI focus on increasing the economic benefits of converting achievements in scientific research into productive force through scientific research management and scientific and technological services, which means the increasing quantity and quality of transformation projects, and the resultant new products and new applied technologies will be highly valued. In this level, the emphasis on the development of the SWI is efficiently acquiring, transforming, using new technologies to enhance economic performance. The details of the short-term objectives are varied from year to year.

The mid-term objectives of the SWI are forming and promoting its core competitive abilities, which focus on the leading position of scientific research and transformation results in the industry. SWI will need not only to pay attention to the quantity of technology transformation products but also to promote their quality, that is, the significance of research achievement and transformation activities.

The long-term objectives of the SWI are the cultivation of sustainable competitive advantages in the industry by building a desirable innovation and transformation environment. Specifically, besides R&D and scientific achievements transformation activities, the SWI

needs to continuously develop its innovation and transformation service system to a high level to make the institute competitive advantages in the industry and world market. SWI believes that only by creating an environment conducive to cooperation, sharing, and joint innovation, can the SW institute attract more world-class high-tech R&D team to participate in the platform, thereby promoting the generation, flow, application and diffusion of scientific research achievements, then ultimately form an industry-leading social impact. The long-term objective of social impact is actually in line with the ultimate expectation given by the governments, which often involves supporting governments' important programmes, helping enterprises innovation, benefiting communities and people, scientific knowledge popularisation, realising economic benefits, etc.

In sum, SWI's short-term objective is to create economic efficiency and gain profits from new products. Its mid-to-long term goal is to have a competitive advantage in the industry and gain recognition from the industry, market, customers, and eventually increasing social impact for the whole society. We find that the Shanghai governments have set clear social impact standards for SWI, which the SWI will be punished if the targets are not met.

2) The SWI's strategies

Based on the three-level objectives, SWI develops its corresponding organisational strategies subject to three development periods, the construction period, the operation and developing period, and maturity period.

The construction period mainly refers to the preparatory and construction phase of SWI. During this period, SWI focuses on the actual needs and future development direction of Shanghai micro-tech industry and the IoT industry to determine the construction plan, develops the strategic plans and detailed objectives, clarifies the future operation and management mode, budget and allocate resources (such as labour, funding, plant, equipment, products, technologies), etc. The general strategic objectives of SWI in this stage is to lay solid foundations for the platform's future mid-and-long term operation and development.

SWI is now in the developing period, while it commits to transcending sensor technology by working on research and development of generic technologies for sensitive components, promoting the development of the sensor-based IoT industry, and building a world-class sensor R&D and production base. Specifically, SWI has identified three key strategic areas, building

a sensor production base, building a sensor R&D base and providing engineering services, for implementing the above strategies.

During the mature period, the government gradually will withdraw from SWI. The strategic focus of SW institute will be gradually shifted from striving for survival to striving for more favourable development opportunities and sustainable development, which eventually gain industry-leading social impact

By understanding the SWI's objectives and strategies, we believe the social impact is the very important long-term performance management objective for the institute. Achieving the desired social impact also is the core expectation for the newly developed IFPs by their major shareholder, the Shanghai governments. However, SWI finds the related work progresses at a slow pace. Hence, SWI wishes to effectively and efficiently achieve this objective by improving the existing performance management.

6.4.4 The existing performance management practice in SWI

By semi-structured interviews about the performance management practices of SWI, we find that the performance management approaches they are using are as follows:

1) Setting overall objectives for performance management

At the beginning of each fiscal year, some detailed top objectives will be confirmed by the board of SWI, which are mostly the overall financial related goals, e.g. service income, debt to assets ratio, etc. Meanwhile, some broad objectives that mostly relates to Sci-tech achievement transformation and industrialisation will be proposed. However, the board will not clarify what specific type of tasks or projects stage the institute need to carry out, neither what progress the running and future projects need to achieve, because those R&D, transformation and industrialisation projects often last several years.

2) Breaking down and deploying the overall objectives to departments

The overall objectives will be broken down into departments until each employee. In reality, the detailed performance objectives for each employee are often integrated into day-to-day work requirements. Because of the vague of research, transmission and industrialisation objectives, the manager of each department or the leader of each project team will decide their own and specific targets for promoting the IFP development progress. However, we find that

the social impact objective has not been reflected in the existing objective decomposing and deploying process.

3) Evaluating performance by KPIs

The KPIs are developed by the human resources management department according to the operational objectives in an organisation level, such as service incomes, attendance rate, job completion, etc. By the end of the year, SWI will evaluate departmental performance, project performance and individual performance. The results of the KPI assessment will be used to decide the staffs' bonuses. However, the existing performance management is mostly linking to its operation, but rarely have a correlation with social impact objectives.

In sum, SWI has used several performance management approaches, such as manage by objectives, objective decomposition, KIP, performance appraisal, etc., and has successfully achieved most of the short-term organisational goals. However, these approaches have issues for achieving the institute' mid-and long-term objectives, especially in terms of social impact. We believe there could be plenty of room for improving their performance management targeting to gain desired social impact based on the Performance Tree Management Framework.

6.4.5 The issues of the performance management in SWI

After in-depth interviews and analysis, several main issues in the operations of SWI have been identified. After discussing and communicating with the manager of SWI, the key issues are confirmed as follows:

First, we find the managers are not able to clearly interpret how does the existing performance management system is designed for linking social impact achievement, which means that the existing performance management system does not fully support social impact dimension.

Second, the existing top-down only manner of performance management could not be suitable for achieving the objective of social impact. As we analysed before, the social impact is often affected by the quality of platform service and the outcomes of R&D and transformation projects in the platforms. To achieve a high quality of platform service, SWI needs to continuously improve the service capability and focus on meeting the demands of each project and their key stakeholders. Therefore, a bottom-up manner of performance management of SWI, such as generating performance objectives, indicators and plans through the discussion

and meeting with platform participates, could help them achieve social impact objective more effectively. Moreover, the timeliness in transformation and industrialisation is extremely important to the IFP. The scientific research achievements need to be transformed into practical application in time. Once an updated technology comes into being, the previous transformation could greatly reduce its significance. Therefore, the objectives of transformation projects need to keep up with changes in the external technology environment and make adjustments in a timely manner to ensure the best economic and social benefits.

Third, the existing performance management system does not put enough emphasis on the synergy and satisfaction of the IFPs' key stakeholders. The key external stakeholders involved in the SWI and its IFPs include government, universities, enterprises, technology intermediaries and venture capital institutions and the society as a whole. They participate in different development stages of the platform and have different needs and objectives. For instance, the government concerns about the effectiveness of public financial input and the expected social impact, scientific research institutions have to balance the basic research, applied research and the return of research, enterprises mostly focus on economic benefits, venture capitals focus on risk control and expected returns, and the platform itself has to combine social benefits and oneself sustainable development. For achieving a desirable social impact, the SWI and its IFPs should theoretically enable all relevant stakeholders to cooperate effectively.

In terms of the above performance management issues, it is unsuitable and difficult to directly apply the most existing performance management frameworks, such as BSC, as they often start with short-term strategies and objectives for further performance management. More specifically, the BSC model and strategy map framework usually require premises on organisation's pre-set objectives or strategies, and then decompose them step by step into operation. We believe, by this way, the BSC model and strategy map framework could help SWI achieve short-term strategic goals but might not be appropriate for the SWI to achieving its broad middle-and-long term objectives and strategies, especially in terms of the social impact attainment. It also seems difficult to apply the existing EFQM framework here as the framework does not directly link to the organisation's particular objective. Therefore, SWI needs a suitable and effective performance management system, yet it appears difficult to be designed by the existing performance management framework.

Hence, we try to design a performance management improvement system for the SWI, as we mentioned at the beginning of this chapter. The development of the performance management system improvement design will ground on the Performance Tree Management Framework.

6.5 Performance management improvement system for SWI

6.5.1 Identify the performance management improvement areas

To design a performance management improvement system aiming to social impact achievement for SWI, we first have to find out what areas or contents the SWI needs to make improvement for its performance management. This step will combine the analysis of important factors for achieving social impact and the understanding of SWI's actual demands.

The SWI's existing performance management system is developed for supporting its core operational processes, i.e. Sci-tech R&D and transformation process, and platform support service process. Apparently, these two operational processes also are the prerequisite and foundation for achieving SWI's social impact objective.

Through the Sci-tech R&D and transformation operation, SWI realises scientific research innovation, transformation, industrialisation and internationalisation of Sci-tech achievements, which directly provide social benefits and economic benefits. Platform support service is one of the main components of the SWI's internal operational processes. It is a set of service systems that mainly surround the Sci-tech R&D and transformation operation. It provides various specialised services to various platform participants, which include hardware services such as providing infrastructure and office space, as well as software services such as technology, management, finance and accounting, marketing, legal advisory and assistance services. It will not only directly affect the development of various participants themselves and projects in the platform, the efficient circulation of innovative resources, technologies and knowledge in the platform but also can help reduce risks and costs, accelerate innovation and conversion speed, and increase platform efficiency and effectiveness. Its social impact embodies through the services for the IFPs' stakeholders and the SWI's overall achievement.

Hence, the identification of performance management improvement area is carried out along the route from two core operational process to social impact (see Figure 6-4). We believe the

performance management improvement system designed in this way could be easily integrated into the existing one.

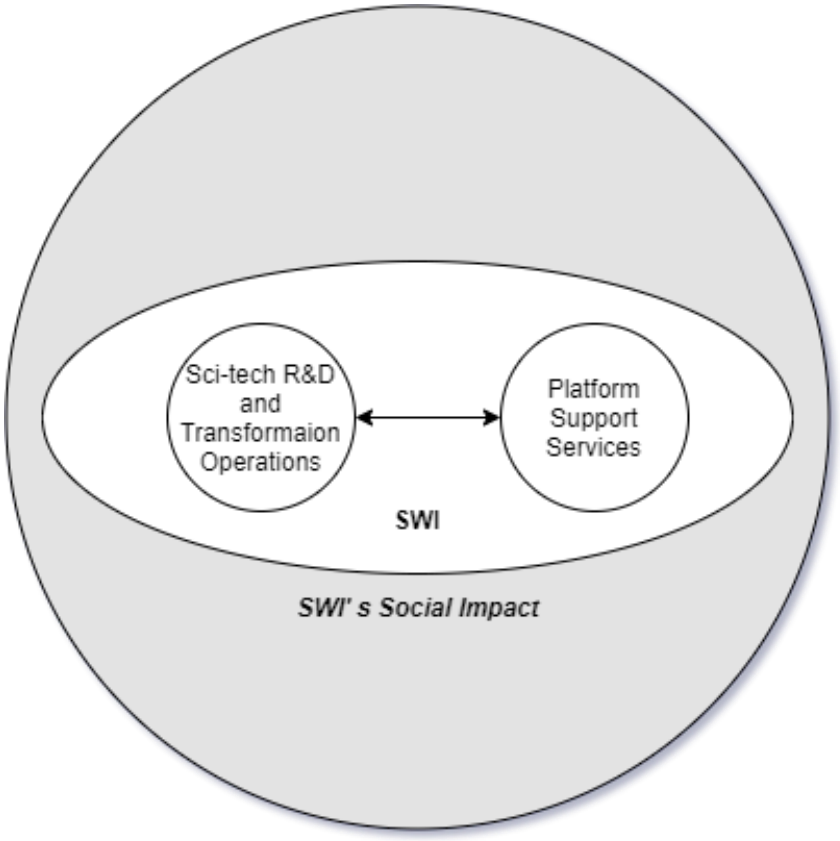


Figure 6-4 From the SWI's core operations to its social impact

The contents of the social impact objective have already been defined by the Shanghai Municipal Government and SWI, which involve many aspects. In general, the desired social impact of SWI includes (1) Forming a global innovation network of micro-electro-mechanical systems (MEMS) and advanced sensor technologies, (2) Developing proprietary technology and achieving breakthroughs in generic technologies in the sensor industry, (3) Achieving innovation of application model in the field of Internet of Things, (4) Leading the development of the world microelectronics industry and IoT industry, (5) supporting governments' important programmes, (6) benefiting communities and people, (7) scientific knowledge popularisation, (8) realising economic benefits. (resource: Opinions of the Shanghai Municipal Government on Accelerating the Construction of a Science and Technology Innovation Centre with Global Impact – 2015, and SWI interview).

As can be seen from above contents of SWI's expected and desired social impact, the most substantial factor for achieving them is the capacity and results of SWI's Sci-tech R&D and transformation operations, which often depend on the capabilities of R&D and transformation project teams and the supportive ability and service quality of the platforms.

It should be noted that we will not too much adjust the existing performance management system that mostly around the Sci-tech R&D and transformation operational processes as we mentioned before. Hence, we concentrate on what needs to be improved in performance management for the platform support service. Based on the interview, we identify three managerial aspects, i.e. human resource, platform regulations and public relations, for the performance management improvement system design, which are explained in detail below.

The platform support service is an essential function of SWI that mainly provides a range of value-added services in addition to the physical space and infrastructure services for participating enterprises and projects attached to the platforms. These value-added services often involve knowledge and technology information communication and exchange platform establishment, innovation technology and product marketing, transformation projects administration, finance and accounting, legal advisory and assistance, etc. By utilising the platform support service, the Sci-tech achievement transformation projects could reduce their transformation risk and innovation costs and, improve the success rate of projects and accelerate the transformation of Sci-tech achievements.

Although SWI's managers have been aware of the importance of platform support service, we find that the existing performance management approaches could not effectively promote the performance of platform support service from the perspective of improving service capabilities and competitiveness. Specifically, SWI's current performance management system focuses on Sci-tech R&D and transformation projects. The platform support service performance is mainly managed through setting daily work-oriented KPIs, such as attendance, compliance rates, complaint rates, etc. It is all agreed with the SWI and us that the current platform support service performance management approaches lack of effectiveness on the platform's long-term development.

To this end, we propose that the SWI needs to put more focuses on improving the performance of its support service system from two aspects. One is to enhance the platform's professional support service capabilities; another is to build a collaborative innovation platform environment mainly through establishing a set of stakeholders and coordination-oriented

platform regulation. By this way, different expert teams, stakeholders and projects can be attracted to participate in the platforms, then smoothly cooperate with sufficient guidance and support, and eventually achieve strong positive social impact for all.

In both respects, SWI's performance management has room for improvement. For example, in terms of talent recruitment, SWI paid too little attention to the growth of the service management talent team. Currently, the platform support service team of SWI is mainly composed of people from government, research institutes. Although there are some masters and doctors who have just graduated joined in recent years, the entire management and service team still lacks practical experience, business experience, social experience. We believe that the platform needs more high-level management consulting skills, investment experts, and senior social activists, etc. Therefore, the new performance management improvement system should strengthen the performance management on talent recruitment and development.

Regarding the construction of platform collaborative innovation environment, SWI has not utilised much corresponding management approaches. To deal with this problem, both corporate culture cultivation and platform regulation system establishment could be feasible approaches. The reason why we choose the latter rather than the culture cultivation is because of the unique IFP nature of SWI. As a public R&D and transformation platform, the formation of a collaborative innovation environment involves more external stakeholders than the traditional institutes. Therefore, a large amount of participates and short working and collaborating period lead to the frequent change of short-term objectives and staffs. It is apparently difficult to deal with this situation through the soft method of culture cultivation. Although this method could be useful in the long-term, this process could be time consuming and inefficient.

Moreover, the construction of synergistic internal regulation is believed particularly important for the R&D platforms by some researchers. Carayannis and Alexander (2004) found that building a scientific regulation of collaboration is an important factor in maintaining and promoting the scientific and technological cooperation between members after the study of Semiconductor Manufacturing Technology in the US. Tjosvold, Poon and Yu (2005) also argued that under the atmosphere of maintaining a cooperative alliance, a set of sound regulations would be conducive to the common goals of all members and the sharing of mutually beneficial visions. In the subsequent research, they also proposed that the more complete the regulation of the platform, the stronger the cooperation and communication

between the various entities of the platform, which is more conducive to the flow, sharing and integration of resources, and ultimately lead to the improvement of efficiency and outcomes (Tjosvold, Law and Sun, 2006).

Therefore, we believe that establishing and following a set of appropriate platform operations and service regulations should be practical for creating a collaborative innovation environment in SWI.

Besides the platform support service capabilities and platform regulation, SWI, and we all believe public relations are extremely important for social impact achievement (Wu, 2017).

The interviews indicate that the social impact achievement of SWI is strongly influenced by external stakeholders, such as local governments, universities, Sic-tech R&D institutes, Hi-tech enterprises, venture capital firms, technology intermediaries, local communities etc. Securing the external stakeholders' support and preserving the institute's reputation via public relations management will actively facilitate the achievement of SWI's desired social impact.

Specifically, the government is undoubtedly the most important external stakeholder in the SWI's construction and development stages. The Shanghai Municipal Government has played an important role in promoting the emergence and development of the SWI as an IFP. It not only provides direct or indirect financial support, but also actively promotes and advocates the construction of the IFP to the society, and formulates preferential policies, providing subsidies, reducing tax exemptions, and encouraging private capital investment to participate in platform construction. The importance of institute- government relation is proved in the interview, that from senior executive to staffs all consider a well-maintained institute-government relationship is vital for SWI’s survival and long-term objective achievement.

Currently, there is no dedicate department in charge of the function of public relations management in SWI. The top executives and managers often take on some of the development and maintenance functions of public relations management that mostly focuses on limited numbers of stakeholders. In terms of the extensive external social relations of public platforms of SWI, this practice is inadequate (Bowman *et al.*, 2018; Wang and Yang, 2016).

For achieving a more substantial social impact, we believe it is necessary to set up a performance management unit, either actual or virtual in SWI, to deal with affairs of public relations effectively.

By doing the above analysis based on the interview, discussion with the SWI's mangers and literature review, we identify three main improvement directions for carrying on our project. They are (1) platform support service capability, (2) Platform regulation, (3) Public relations, (see Figure 6-5). We believe these three performance management improvement aspects well meet the actual demands of SWI's management, which all are important global coordination approaches. Attaining a certain level of the platform support service capability by training skills, recruiting talents, is a specified objective of performance planning, which is an identified global coordination approach in Chapter Five. Making platform regulation exactly belongs to global coordination by rules and culture establishment. Managing public relations can provide a global coordination mechanism for the SWI both from internal and external. It could be a new type of global coordination approaches in the Performance Tree Management Framework.

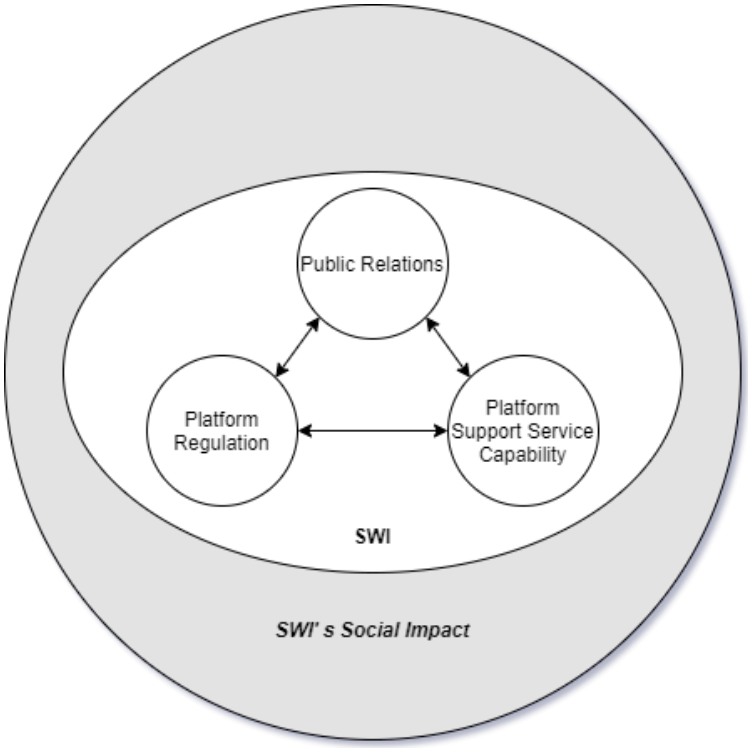


Figure 6-5 Identified performance management improvement areas

We will implement the determined three global coordination based on the five steps of Sci-tech R&D and transformation operational processes in SWI that is described above, and these will be discussed below.

6.5.2 Design detailed performance management improvement plan by Performance Tree Management Framework for SWI

After identifying the key improvement areas of global coordination for social impact achievement, we need then to decide what kind of management structure will be adopted for further performance management.

Although the existing organisational chart could be seen as a ready-made management structure, as the existing performance management indeed does well for achieving most of the pre-set organisational objectives. However, as we mentioned at the beginning of this chapter that our mission is not to design an entire performance management system, but only the part that aims at social impact achievement. Therefore, we adopt the five steps of Sci-tech R&D and transformation operational process as the basis of management structure, which could clearly represent the primary process of social impact generation.

The reason is that this operation process is the key backbone of SWI's operation, which plays a fundamental role in achieving SWI's social impact objective. Meanwhile, only the platform service attaches to this operation process, could it realise its value and attain a positive social impact.

Moreover, as we proposed before, a performance unit in charge of public relations will be added to the management structure. The new public relations performance unit not only directly coordinate the external stakeholders to enhance social impact achievement but also the five Sci-tech R&D and transformation processes to guide and enhance their social impact.

By this way, we develop a management structure for implementing our succedent performance management improvement plan. The development of management structure reflects the idea of performance tree in the new proposed performance management framework.

After that, combined with the identified three performance management improvement aspects, we develop an entire performance management sub-system for our project (see Figure 6-6).

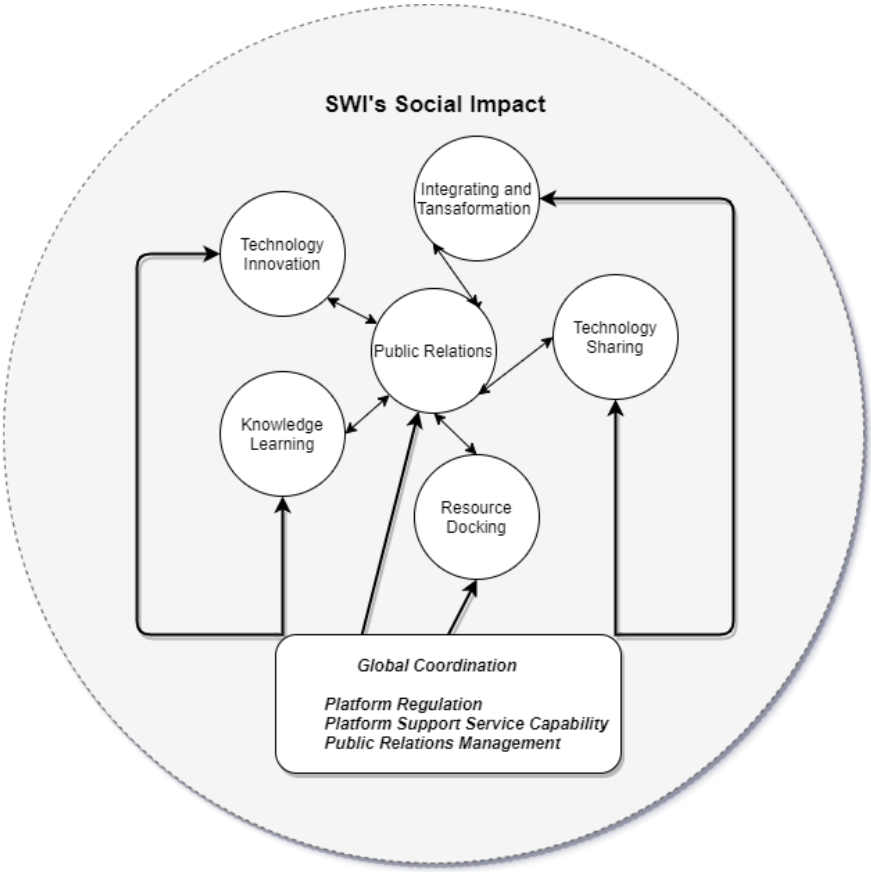


Figure 6-6 The designed performance management system for SWI

6.6 How to implement the designed performance management improvement system

In this stage of our project, we develop detailed performance management approaches for implementing the designed performance management improvement system in SWI. However, due to the complexity of real performance management practice, it is impossible for us to develop exhaustive performance management approaches for the SWI. Mostly, we only recommend some advice that may be appropriate for promoting social impact and propose some principled suggestions on some key issues of implementation.

6.6.1 Platform regulation

At a general level, the most important consideration when design a platform regulation should be given to how to effectively organise platform members to create a fully collaborate and innovative environment. The key points could include how to promote identifying the value of market demand information together, help to introduce institutions with core technologies, etc. It should also grasp the advantages of their rich information resources for attracting funds, carrying out various types of in-depth innovation cooperation, and strengthening the connection between members to create a social service platform for joint innovation and application.

Moreover, we give three aspects of advice for the SWI in terms of setting up its platform regulation.

1) SWI regulation need to cope with the differentiation of projects' organisation structure types

In SWI, one of the key routes for achieving social impact is through the core Sci-tech operation. While the core Sci-tech operation is embodied in independent or corporate R&D or transformation projects based on the platforms. Hence, establishing the appropriate regulation for SWI needs to consider the features of its projects in the platforms. We believe one important factor is the different organising structures of various projects, such as focusing on encouraging innovation cooperation, or focusing on knowledge sharing and service, or focusing on project risk avoidance.

By analysing the organising structure of existing projects in SWI and from public reports, we divide them into three main types of projects and then propose differentiated regulation designing requirements in principle.

Type I: The loose organising structure of the project

In this type of structure, there are no dominated members, and it is difficult to form the cohesiveness in the project procedure. At the same time, members of this type of structure do not form a close relationship in terms of R&D and innovation. Therefore, it is difficult to form a productive learning atmosphere in the platform to realise the sharing and circulation of knowledge and resources. The relationship between members of this type of structure is relatively loose, and it is challenging to form in-depth strategic innovation cooperation.

Therefore, the coordination and management cost of R&D, innovation and transformation activities among members of such structures are relatively high. Technology sharing and achievement transformation require stronger driving force and more time. To this end, for this type of structure, the regulation design could use administrative intervention mechanism to guide and encourage project members to strengthen internal and external connections and cooperation. Moreover, because the cooperative links of members of such structures are not mature and frequent, the platform could use the incentive mechanism of co-creating a shared benefit to encourage the members' cooperation. The platform even can carry out local investment and financing among platform members who are driven by market and technology demand or optimise the allocation of capital shares of internal members, thereby improve the loose structural relationship through in-depth cooperation of capital.

Type II: The central dominant organising structure of the project

In this type of structure, some participants have mastered the key technologies and capabilities of R&D, innovation, and transformation. These superior players can use each other to form strong cooperative links within and outside the platform. At this time, these core members can rely on their superior position to conduct high-frequency exchanges and cooperation with other members and transactions, forming the ability to influence the process of a project through platform resource allocation and flow through communication. Most of the projects in SWI belong to this class.

The coordination mechanism in this type of structure will be largely affected by the centred members. They will implicitly or explicitly influence the coordination approaches of the platform. Therefore, when establishing a corresponding regulation, it is necessary to consider how to coordinate the goals of each member comprehensively. While providing support to the core units or centred member, it also should pay attention to the need of those participants who do not occupy a central position in the platform, as they urgently want to obtain shared achievement and revenue through more collaboration. The regulation should also enable all participants to overcome their shortcomings with it, which can help the platform get rapid development and achieve desired performance goals.

Type III: The aggregate organising structure of the project

The aggregation of the members of this type of structure is because of the aggregation of the information mostly, but not of the convening of some centred members who have core

technology. For example, companies in the platform conduct R&D and transformation activities under market orientation. This kind of project is often based on rich information and satisfying the market's technological and innovation demands. However, it is difficult for theses participants to form mature collaborative relationships in the platform in a short period of time, because each participant is likely to stagnate the flow and sharing of critical information, making it difficult to form a clear division of labour and results sharing mechanisms. Moreover, they may also encounter difficulties in lacking support of core technologies if they do not have a wide range of internal and external collaborative networks.

The processes of building a global coordination mechanism and collaborative environment are different among the platforms with different structures. In the SWI, the R&D and transformation projects within the platforms are mostly organised in a central structure. When the SWI design and implement its detailed platform regulation, the structural characteristics of the platform should be fully considered.

2) An outlined platform regulation framework could help SWI to design its platform regulation

Further, an outlined platform regulation framework is designed for the SWI to design and implement its platform regulation by us. The contents of this framework are comprehensive. The SWI could choose the parts they want to improve in the regulation establishment as guidance.

1. Daily operation management rules

a. Improving the expert advisory committee. The committee should be composed of well-known experts. The main functions of the committee are: suggesting the specific goals and key innovation directions for the platform development; reviewing the platform's major academic exchanges and scientific and technological transformation activities; reviewing the platform's annual work plan and yearly research report aiming to balance interests of all the key stakeholders; and guiding domestic and international academic exchanges. The Technical Committee meets at least once a year.

b. The platforms' daily operations management. Establish a dedicated platform integrated service and management office, which mainly response for the day-to-day management and daily affairs of the platform, including the formulation and implementation of various management systems and work procedures of the platform; and response for the construction of the professional service system of the platform.

c. Establish and implement various rules and regulations of the platform. The platform shall formulate detailed and feasible rules and regulations for people, finance, materials, production, scientific research, and services, such as internal management system, incentive mechanism, project management mechanism, talent use mechanism, etc.
d. Set scientific research leaders on research and transformation of key technologies. All projects and their teams will be classified into groups according to the direction of the research, and the scientific research leader will be responsible for the in-depth and long-term planning, so as to play the advantage of cooperation and sharing among the teams and projects.
e. The platform's resources management. The platform continues to increase the openness to society and industry, improve the efficiency of the use of various equipment, and create higher economic and social benefits.

2. Platform cooperation management rules

The platform implements an open, cooperative and mutually beneficial operating mechanism in research topics and transformation project selection, technology development, external cooperation, and personnel management.

f. In terms of external cooperation, the platform will base on the 8-inch "More than Moore" R&D and Pilot Line, and establish the cooperate regulation on universities, research institutes, industrial enterprises and institutional investors. The purpose is to take advantage of the strengths and advantages of universities and research institutes in basic theoretical research and to take advantage of the role of industry and investment institutions in technology conversion, innovation and application.
g. In terms of personnel training, in addition to attracting outstanding domestic and foreign scientific and technological talents, the platform must also absorb talents with professional services and management capabilities to create a high-level team of research and service.
h. The platform should establish an open sharing management system, strengthen the close cooperation of various stakeholders or participants, and effectively improve the research and development and the ability to transform results. The platform establishes an effective operational management and scientific evaluation system to provide a strong guarantee for the realisation of the strategic goals.

3. Project collaboration rules

i. Communication and coordination system at the project decision level. It is necessary to organise scientific research institutions, cooperative enterprises, and investment

institutions to communicate fully, exchange information and evaluation on the R&D basis, technical difficulty, peer competition, production requirements, and market demand of the cooperative projects to help improve the effectiveness of project decisions, which also lays a good foundation for the development of later projects.

j. Communication and coordination system for cooperative R&D personnel. In the process of project cooperation and research and development, it is necessary to gradually establish an excellent communication and coordination relationship between the cooperative R&D personnel. The system should focus on the full exchange of information within and between teams during the research process and build a channel for the transfer of tacit knowledge.

k. Communicate and coordinate with the support department. In order to ensure that the relevant departments outside the project team jointly support the development of the project, it is necessary to establish excellent communication between the project team and these departments. Communication with the production department is conducive to a better connection between project development and future production; communication with the marketing department is conducive to project research and development to obtain more information and inspiration from front-line customers; communication with support departments can make the project Get the required material support in time.

3) The key points of regulation establishment in each performance units to achieving social impact objective

The Resource Docking unit could emphasise on setting up the rules on an evaluation system for identifying high-quality or potential significant social impact resources and projects.

The Technology Sharing unit could emphasise on regulation building aimed at establishing and improving mutual trust among individuals, teams, projects, and organisations, and this system is often informal.

The Knowledge Learning unit could emphasise on the development of shared knowledge selection principles to identify those who could have potential value and significant social impact.

The Technology Innovation unit could emphasise on setting up the rules concerning marketing and technology diffusion for achieving significant social impact.

The Integrating and Transformation unit could emphasise on developing the rules for understanding the demands of the industry and society, and promoting and advertising the transformation achievements.

The Public Relations unit could emphasise on establishing the rules related to enhancing communication with the government, society and industry, coordinating and balancing relationships between internal and external stakeholders, and creating a positive institute image in public.

6.6.2 Brief suggestions for coordinating platform capability and public relations

Here, we give some brief ideas of global coordination approaches for improving the platform support service capability and managing public relations.

To improve the platform support service capability, we suggest the key point is to build a professional and international support service talent team. The corresponding methods may include: (1) Talent introduction and cultivation. For example, the SWI could recruit experienced technology transfer service talents through a market-based talent selection mechanism and establish incentive mechanisms for platform support service staffs. Meanwhile, the SWI can jointly cultivate technology transfer service talents and cooperate with other R & D institutions, universities, or internationally renowned institutions. (2) Strengthen the training of the current support service employees. While improving their service capabilities and quality, the training should pay attention to the cultivation of communication and coordination capabilities, with the aim of establishing a mutually beneficial and win-win innovation atmosphere in the SWI.

In addition to the traditional functions of the public relations department, the newly established section is considered to have a key coordination function to build the social innovation network, both internal and external. For example, to establish an internal social network for facilitating the information sharing and working coordination, SWI could use Mobil-workplace apps, such as Ding Talk (Mo and Yu, 2017), WeChat Work (Zou, 2018), 263.net, and do on. To establish an external social network, the SWI has already developed its website, which needs further good maintenance and updating. Besides, the SWI could create its WeChat public account to improve public information about its achievement and increasing the interaction with the public for achieving its social impact objective.

6.6.3 Develop performance measurement for SWI

Next, we utilise the 3E methodology (Liu *et al.*, 2010) to develop KPIs based on the six identified key processes, i.e. resource docking, technology sharing, knowledge learning, integrating and transforming, technological innovating and managing public relations(they can be seen as virtual performance units in the Performance Tree Management Framework), for SWI's three performance management global coordination to enhance social impact.

In general, the 3E indicators methodology is first to develop key process plans of each performance unit and then determine their key performance indicators accordingly (Liu *et al.*, 2010). Ideally, the above KPIs development procedure needs ground on iterative dialogues and discussions with particular key stakeholders in SWI. Often, many performance indicators could be identified by the above process. Making the KPIs practical, it is necessary to filter the large amount of KPIs to between five and nine. In like manner, the final KPIs must be discussed and agreed with the line managers and their key staffs.

We develop some key process plans of six performance units as a demo from the platform supportive services perspective, mostly based on the interview.

1) Recourse docking
a. Organising the communication between the owners of Sci-tech achievements and the parties with industrial demands
b. Identifying the high-quality or potential significant social impact resources and projects
c. Recruiting professional and experienced platform service talents
2) Technology sharing
a. Organising technology communications and exchanges among project teams within the platform (formal, informal)
b. Conduct training to raise awareness of intellectual property protection in the platforms
3) Knowledge learning
a. Visit well-known domestic and international R&D institutes, innovation centres and universities to gain cutting-edge industrial knowledge trends
b. Carry out learning and training of cutting-edge knowledge Technology innovation for the staffs
4) Technology innovation
a. Participate in various technology exhibitions and understand technology development trends

b. Carry out technology exchange and innovation meetings, service platform technology innovation

5) Integrating and transforming

a. Visit relevant firms in the industry to understand the actual market demands of technology transformation

b. Recruit experienced talents or coordinate with external experts, institutes, enterprises to support demand-led design for transformation projects

c. Improving the infrastructure and facilities of the platform

6) Managing public relations

a. Using social media applications for internal coordination and external communication

b. Launch and participate in various promotional activities and exhibitions

c. Managing social media and conducting propaganda of SWI's research results, economic and social benefits

d. Regular visit key stakeholders, especially the government

Further, we design the relevant KPIs for monitoring the implementation of performance management improvement system (see Table 6-2).

Table 6-2 KPIs for implementing the performance management improvement system

Performance Units	Key processes	Key Performance Indicators
Resource Docking	Organising the communication between the owners of Sci-tech achievements and the parties with industrial demands	The number of a two-side meeting held
	Identifying the high-quality or potential significant social impact resources and projects	The value of resources and demands information recorded The number of related research reports to the board of directors
	Recruiting professional and experienced platform service talents	The number of new recruited senior service staffs The ratio of senior service staffs
Technology Sharing	Organising technology communications and exchanges among project teams within the platform (formal, informal)	The number of technology communications and exchanges meeting held
	Conduct training to raise awareness of intellectual property protection in the platforms	The number of training on intellectual property protection The number of complaints about technology protection issues in the platform
Knowledge Learning	Visit well-known domestic and international R&D institutes, innovation centres and universities to gain cutting-edge industrial knowledge trends	The number of visiting well-known domestic and international R&D institutes, innovation centres and universities The number of people participating in related conferences
	Carry out learning and training of cutting-edge knowledge Technology innovation for the staffs	The number of knowledge lectures and seminars held The number of platform members participating in learning
Technology Innovation	Participate in various technology exhibitions and understand technology development trends	The satisfaction of communication and coordination by the project teams and relevant stakeholders
	Carry out technology exchange and innovation meetings, service platform technology innovation	The number of technology exchange and innovation meetings held The satisfaction of platform participants on the technology innovation process
Integrating and Transformation	Visit relevant firms in the industry to understand the actual market demands of technology transformation	The number of related firms in the industry visited

	Recruit experienced talents or coordinate with external experts, institutes, enterprises to support demand-led design for transformation projects	The number of industry experts and marketing talent recruited The ratio of experienced experts recruited The number of external partners established
	Improving the infrastructure and facilities of the platform	The satisfaction of the project teams
Managing Public Relations	Using social media applications for internal coordination and external communication	The usage rate of social media applications
	Launch and participate in various promotional activities and exhibitions	The number of related social activities organised and participated
	Managing social media and conducting propaganda of SWI's research results, economic and social benefits	The number of public propagandas carried out The number of views on social media The media coverage
	Regular visit key stakeholders, especially the government	The satisfaction of key stakeholders

At the end of this case study, we give the performance management improvement system design to the SWI and receive much positive feedback from the managers. Although the effects of the new integrated performance management system will take a long time to present, the managers believe they could develop and utilise more performance management methods to deliver their managerial purposes based on the performance tree management theory.

In sum, through this case study, we have applied and tested the performance tree management theory to some extent. The results of this case study show that the Performance Tree Management Framework is feasible in practice, especially for organisations that are difficult to use traditional performance management frameworks. The Performance Tree Management Framework can be used to flexibly develop a tailored performance management system for a particular organisation, especially for achieving its mid-and-long term objectives. Meanwhile, the global coordination mechanism in the performance tree management has also been applied, such as the identified global coordination by performance planning, global coordination by the regulation establishment. Moreover, we also discovered new global coordination methods, i.e. managing public relations. This new approach extends the scope of global coordination approaches because it can coordinate both external and internal units/stakeholders to improve organisational performance.

Chapter 7 Case Study of Venture Capital Firms

In today's highly competitive business environment, it is difficult to reinvent the wheel and engage in costly innovations of management from scratch for most of the newly developed companies. Specifically, most of the businesses, especially the small and medium enterprises, often have little time and opportunity to build their unique performance management methods. Therefore, producing high efficiency only through the company's internal capacity could be difficult and costly for them to some extent. In this sense, it could be much convenient and more effective for a company to carry out performance management practice by borrowing sophisticated management approaches from other successful companies or the industry's successful experiences. Although the EFQM excellence model can be used to design their performance management systems by borrowing some best practices in the industry, they are not directly to enhance any specific/ short- term objectives of the company.

As we mentioned from the literature review in Chapter 3, the existing performance management systems in practice are either for an individual company or standardised approaches for achieving excellence without aiming particular objective and strategy. Meanwhile, there seems no existing performance management frameworks can be utilised to design a performance management system, which is applicable to achieve common goals and provide benchmarks both for a group of company in the same industry.

Coincidentally, we know that W Institute is conducting a research project about improving venture capital firm's management in China and, gain permission to take part in some of their field visit and interview. We find a group of venture capital firms have strong desires to improve their performance management systems. Hence, we carry out our second case study, that is to design an effective performance management system aiming to achieve and enhance a key common objective of a group of firms. Ideally, the newly designed performance management system could be used by anyone of these firms to manage its performance or carry out benchmarking. This case study bases on our visit and interview of 11 venture capital firms, by which we gain a considerable understanding of the core operations and the status quo of performance management of this industry by the field study.

7.1 Background

Venture capital refers to a specific form of financing, often invests in private companies at various stages of their development for economic benefits. In addition to the capital injection, investors or their agents often participate in the governance of the investee company (Jain, 2001).

In China, venture capital emerges from the mid-1980s, initially uses to support the development of high-tech and R&D enterprises (Ahlstrom, Bruton and Yeh, 2007). Subsequently, the Chinese venture capital industry has experienced dramatic growth and especially rapidly in recent years. China becomes the second-largest venture capital market by total invested capital across the world (Zhang, 2011).

Venture capital firm is often defined as an institution that makes capital investment in fast-growth ventures before they are publicly listed. Depending on the time investment happen at the various developmental stages of venture investment, the investment to an early-stage firm often refers to the venture capital, and the investment to the late-stage firms is usually referred to as a private equity fund (Pan, Zhao and Wójcik, 2016). Functionally, venture capital firms often serve as "brokers" between ventures and investors. The investment activities mostly include raising funds, project selection, participating the governance in the companies they have invested and exiting the investment, are mainly realised by its venture capitalists and their investment teams (Sahlman, 1990). In China, venture capital firms play an increasingly important role in spurring high-tech industries, regional economic growth and the transformation of the national economic structure. According to China's Venture Capital Industry development report in 2017, the number of venture capital firms registered in China have reached 3546 with total assets of 594.8 billion Yuan, and a total of 55,478 various enterprises gain investment from venture capital cumulatively (Sun, Zhao and Sun, 2018).

However, the venture capital industry in China is still young and immature, and the Chinese venture capital firms often operate imperfectly (Cao *et al.*, 2018). Especially in the context of the slowdown of China's economic growth, the downturn of the domestic capital market, and the obstruction of overseas listings, the development of Chinese venture capital firms are not at the desired pace currently. This situation should be the result of the combined effect of various factors. Among them, one of the critical issues is that only very few venture capital

firms in this industry have effective performance management systems. In contrast, most of the small and medium venture capital firms are struggling to develop effective and accessible performance management systems. From the literature review, most of the performance management studies in venture capital industry are fragmentary, either focusing on explaining the investment performance or the choice of investment method (Lossen, 2007) or only emphasising on the top management team and personnel incentive (Zhang, 2012). Therefore, to meet the demand of the venture capital firms development, we try to design an effective performance management system that can be shared to use for a group of firms in the venture capital industry, based on the Performance Tree Management Framework. As the performance management system will be developed based on a selected common goal and generic processes of the venture capital industry, it also could be used to benchmarking processes and performance metrics to industry bests and best practices from other firms.

7.2 Information gathering

We have visited 11 financial entities in total, which include investment banks, insurance fund management and investment companies, equity investment agencies, investment departments of state-owned banks, investment departments of business groups, investment departments of securities companies locate at Shenzhen, Hangzhou and Ningbo in China. Gathering data about the performance of Chinese venture capital markets is a challenge. In this thesis, we are collectively called these entities venture capital firms. No matter the firm is state-owned or private equity holders, they all insist on the privacy of their data, especially value-related data. Hence, we ask them the questions about what, why, how they carry out their performance management and the performance outcomes at a general level. Then, we enrich our understanding of the venture capital industry and venture capital firms' performance management practice from literature and public reports. By this method, we learned the essential knowledge about the venture capital investment processes and the corresponding performance management for the succedent performance management system design.

7.2.1 Brief introduction of the 11 venture capital firms

Firm 1:

Ownership: Joint-venture.

Core business: Providing financial advice on Initial Public Offerings (IPOs), mergers acquisitions, restructurings, financings, capital raising and global fund management.

Firm 2:

Ownership: Private.

Core business: Financing advisory services, Pre-IPO assistance services and asset management.

Firm 3:

Ownership: Joint-venture.

Core business: Multiple types of asset allocation, Insurance industry investment platform. Key investment targets include major national strategic projects, such as "the Belt and Road Initiatives", "Yangtze River Economic Belt", "Beijing, Tianjin and Hebei Collaborative Development", major social welfare projects, such as "New Urbanization Development", infrastructure development, new economic drivers and industry upgrade in Big Consumption, Big Healthcare and New Energy, and consolidation and restructuring of the over-capacity industries.

Firm 4:

Ownership: Joint-venture.

Core business: Facing the innovative economy, it operates on the principle of marketisation and specialises in investment. Mainly engages in venture capital, private equity investment, corporate mergers and acquisitions, private placements, National Equities Exchange and Quotations (NEEQ) funds and corporate financial consulting and other equity investment and asset management.

Firm 5:

Ownership: Private.

Core business: The firm is devoted to offering underbanked individuals and Small and medium-sized enterprises (SMEs) with a variety of convenient and high-quality financial services.

Firm 6:

Ownership: State-owned.

Core business: insurance, securities and futures, asset management, new finance. The firm provides financial investment, capital operation, consulting, and other financial services.

Firm 7:

Ownership: State-owned.

Core business: Investment & Financing Advisory Service, which includes financing policies and environmental analysis, customer investment and financing capability diagnosis, investment and financing asset risk and income analysis, design of investment and financing plans and schemes, investment and financing maturity structure matching, recommendation and selection of investment and financing instruments, returns improvement and financing cost control, credit enhancement and design of debt repayment plan, investment banking product distribution, investment banking integration service, interbank cooperation, non-standard investment syndications and other investment innovation advisory services.

Firm 8:

Ownership: State-owned.

Core business: Financial advisory, debt financing, equity financing, IPO and refinancing, private equity investment funds, securities sales, financial market research services.

Firm 9:

Ownership: Private.

Core business: Equity investment, debt investment, joint investment, mezzanine fund, financing guarantee, capital operation (merger and acquisition, listing operation), asset management, trust business.

Firm 10:

Ownership: Joint-venture.

Core business: securities brokerage, securities investment, securities trading, securities investment consulting services, securities trading services, financial advisory services for securities investment activities, securities underwriting and sponsorship, securities asset

management, margin financing and securities lending, securities investment fund sales agency, distribution of financial products and stock options market making.

Firm 11:

Ownership: Joint-venture.

Core business: Bond underwriting, asset securitisation, syndicated loans, merger and acquisition loans, financial management services.

By comparison, we find the 11 venture capital firms have different ownership, staff size, fund management scale, the number of running projects, organisational structure, management style, etc. However, despite the above differences, all the venture capital firms still share some key commons, such as the venture capital investment process and taking the investment (financial) success as one of the key organisational objectives.

We believe the commons investment processes and the common objective of making financial benefits in these 11 venture capital firms are the premises for developing the desired performance management system we discussed at the beginning of this Chapter. In other words, the existing commons of the 11 venture capital firms show us the feasibility of the proposal in this case study.

7.2.2 Investment process in venture capital firms

In this stage, we first identify the generic investment process in the 11 venture capital firms, which could help us understand the generation process of venture capital firms' performance and, would be essential for our further performance management system design.

Venture capital firms mainly invest in various projects by direct investment or establishing a limited partnership. Therefore, the investment process in a venture capital firm is almost project-based. The investment project is mostly carried out by one project team composed of personnel from various departments in a venture capital firm. Specifically, in an investment project, the core person in charge of the investment fund is called GP (General Partners), and the investment follower is called LP (Limited Partners) (Crain, 2018). Under normal circumstances, the GP also needs to contribute part of the investment funds, which is generally more than 5%. There are two sources of GP: one is from the partnership team. They have excellent fund-raising ability. The other is the addition of new external investment partners and

excellent internal executive staff. Besides, other standard personnel in venture capital firms often includes Vice President, Principle, Investment Managers, Analyst/Researcher, Associate, and Office Manager, etc.

Venture capital is a multi-step capital operation process that involves three major participants: investors, venture capital firms, and start-up companies. Investors are the source of venture capital. They are responsible for providing capital to venture capital firms and acquiring the increased value. They also bear the corresponding risks for venture investment. Start-up companies use venture capital funds and are expected by investors to produce financial benefits. A venture capital firm is a bridge connecting investors and start-ups. It is responsible for the investment and management of venture capital and plays the most critical role in the entire venture capital investment process.

Generally speaking, a complete venture capital investment activity often can be distributed into three stages: fund-raising stage, investment stage, post-investment management and exit stage. In the fund-raising stage, venture capital firms mainly raise venture capital from investors. In the investment stage, venture capital firms mainly select high-growth start-up companies as their investment targets and then invest them. In the last stage, venture capital firms realise their investment benefits through exit activities followed a period of post-investment of invested companies. Specifically, the post-investment management means a venture capital firms participates in the decision-making or governance of the start-up company to a certain extent and provides necessary value-added services that often involve providing professional experience in management to support the start-up companies' decision-making, internal governance, capital structure optimisation and human resources arrangement, etc. Exit refers to a venture capital firm exits its investment from an investee company through equity transfer at an appropriate time for getting value-added returns on equity value (Cumming, Grilli and Murtinu, 2017). We illustrate the generic investment process of a venture capital firm in Figure 7-1.

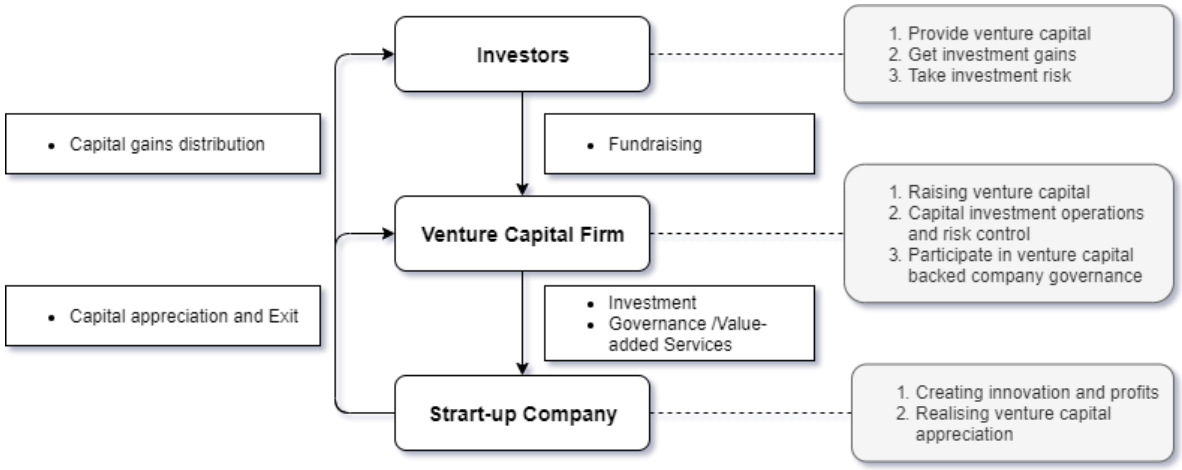


Figure 7-1 The investment process of venture capital firm

By understanding the investment process of venture capital firm, we find that the actual meaning of investment in venture capital industry is much broader than what we think. Especially, venture capital investment involves not only investment activities but also management activities for its invested companies.

Further, we learn about the operational process of investment with more details from the interview. It could be helpful to our succedent performance management system design.

More specifically, in a venture capital firm, a venture capital investment project often involves people from many different teams/departments, such as investment team, project risk control team, fund investment sales team, management support team, etc. Often, the venture capital firm's partners, top management and investment managers will all participate in an investment project then to form an investment project team. In the procedure of and investment project, the newly formed investment project team will lead the project, and other teams/departments collaborate and provide support. We summarise the detailed operational processes of venture capital investment from the interview in Figure 7-2. The operational process of venture capital investment involves three stages:

Pre-deal stage: Project information collection, project data selection, preliminary due diligence of the project.

Deal stage: Project evaluation and decision-making phase, project establishment, professional due diligence, roadshow, contract signing, negotiation, etc.

Post-Deal stage: venture capital-backed company management, providing value-added service and exit.

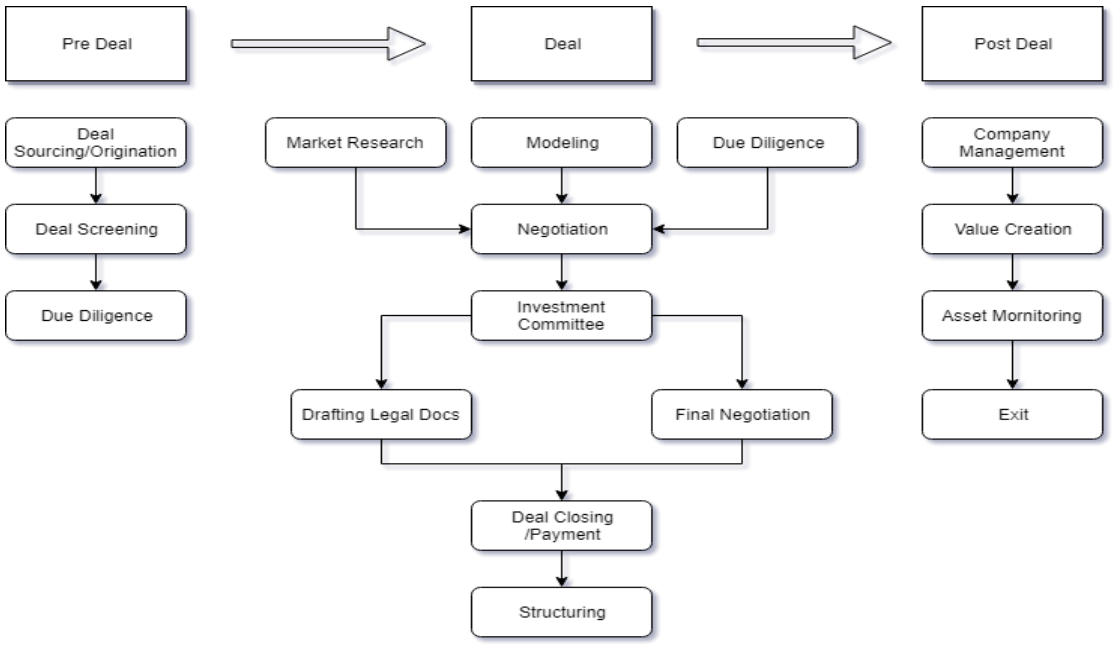


Figure 7-2 The investment operational process of venture capital firm

Moreover, the primary and common objective of venture capital firms is to maximise financial return with portfolio companies exiting via being acquired or going IPO (Zhong *et al.*, 2018). Similarly, the 11 venture capital firms we visited have a key common goal, that is to realise expected investment returns. By the interview, we find that the primary income of venture capital firms includes fund management fees, income distribution of project exits, investment consultant income, fund supervision fees and others. Fund management fees and project exit income are the primary sources of a firm's profit. Venture capital firms generally collect fund management fees in accordance with 2-3% of the funds under management, yet when the amount of capital management is relatively large, the charging ratio will be reduced accordingly. In addition, gaining capital equity and gaining investment income is its most important and significant source of profit. The achievement of the financial objective of a venture capital firm depends to a great extent on the profits-making via the exit process. Often, a venture capital firm obtains economic profits via transferring the equity of the invested enterprise, such as share transfer of the invested enterprise after listing, industry mergers and acquisitions, management acquisitions, etc.

7.2.3 Current performance management practice of the 11 venture capital firms

In the interview, we ask the managers of 11 venture capital firms with questions about how they carry out performance management in general. In general, the 11 venture capital firms interviewed all believe that managing performance is important for achieving organisational objectives and strategies. However, very few venture capital firms, often state-owned, establish a comprehensive performance management system. Most of them only use some of performance management/evaluation approaches, such as MBO, performance appraisal by KPIs, daily work monitoring, skill training, etc. The common point is that performance evaluation and financial incentives for individuals or project teams are very popular in almost every venture capital firm's performance management practice. As reflected in the interview, each of the 11 venture capital firms wishes to know and learn how other firms in the industry carry out performance management.

The 11 venture capital firms have a key common objective, namely financial benefits, as we discussed in the above sections. To achieve the financial objective, the 11 venture capital firms set up a series of financial performance indicators, such as the amount of capital raised, the amount of money invested, the number of investment projects, financial services revenue, investment incomes, etc. Actually, the financial performance indicators simplify the contents of organisational objectives and strategies. Process factors and other non-financial factors are also very critical for achieving organisational objectives. Only focusing on financial performance indicators could reduce the effectiveness of performance management. This view is supported through interviews, as we find that most venture capital firms are not satisfied with the effectiveness of the performance management methods they currently use. They tell us the reason for neglecting the process performance indicators is that they experience the detailed investment process is very much flexible. The venture capital firms expressed the expectation of increasing the proportion of process management or other critical non-financial factors management for enhancing organisational performance. However, they find that the most popular performance management frameworks, such as the BSC model, the EFQM excellence model, are not suitable for the venture capital industry. The main reason is that they believe a heavy performance management system will not work well in their firms from their experiences, which is often ideal for labour-intensive industries. Hence, a tailored and flexible performance management system is what the venture capital industry prefers.

Based on the above analysis, we gain more specific ideas about our work in this case study. We will not need to design a comprehensive performance management system for the 11

venture capital firms. One reason is that almost all 11 venture capital firms have no demands to update their entire performance management system, as their current ones work well to some extent for achieving the overall operational objectives. Despite this, we still find we can design a performance management improvement system for them to enhance their most important financial objective. Hence, our goal of this case study is to design a performance management sub-system which can deal with other critical factors, which are mainly human capital and social capital factors and can enhance financial objective and are applicable to all these 11 venture capital firms.

Moreover, we summarise some detailed performance management issues in these 11 venture capital firms, which are frequently mentioned in the interview.

1) Lack of performance coaching

The existing performance management of venture capital enterprises is basically performance evaluation only, and its role is mainly reflected in the distribution of performance wages, adjustment of promotion and other aspects. This method fails to give full play to the important role of performance management in improving business operations and driving performance growth. Specifically, it is challenging to find deficiencies and problems in the investment operation process and propose feasible improvement approaches, so that performance management can be an effective tool for diagnosing business and operations conditions, strengthening team and talent development, and enhancing the performance form all level.

2) Over-focus on outcome indicators

The existing performance evaluation indicators in the practice of various venture capital firms have a common feature, that is, the performance indicators are closely related to the results, but relatively fewer indicators are involved in the investment operation process or other factors. In fact, through interviews, managers show their actual demands to strengthen process management. They believe that strengthening control over the investment process is important to improve the firm's overall performance. At the same time, they also realise that the investment business should pursue a balance between short- and medium-long-term benefits. Over-emphasis on the results can easily lead to short-term behaviours, such as weakening reputation, which is not conducive to the sustainable development of the firms. However, these management needs are not fully reflected in the actual performance management practice. Performance indicators are relatively fewer in terms of process and capability indicators such

as customer development, financial product development and innovation, team building, and talent training.

3) Lack of guidance for talent introduction and training

Through interviews, most managers realised the importance of core business staff introducing, training and investment teams building. They often struggle on whether to introducing external talents or cultivating their internal employees. Moreover, although the company inspected the employees' innate qualities, intelligence quotient, education attainment, responsiveness, communication skills, and adaptability when recruiting, it is rare to provide them with a good vision plan and vocational training program to make these employees further develop their abilities and career. A good vocational training program can not only achieve a win-win situation for both firm and employees in the process but also enable the firm to get the full support of employees in times of crisis, due to the long-term mutual benefit system.

The issues we summarised need to be considered and dealt with in our sub-performance management system design.

7.3 Design sub-performance management system for the 11 venture capital firms

7.3.1 Develop a management structure

We will adopt the operation process perspective to develop a management structure for performance management that aims to achieve the financial objective. However, each venture capital firm has a specific operation process mode to achieve its financial objective. In this sense, it is difficult for us to develop a management structure with the real operation process. Hence, we use a common and agreed operation/venture capital investment process as the underlying process/ structure for performance management. In other words, a virtual structure will be used in the sub-performance management system design.

For the convenience of our case study, we summarise the processes of venture capital investment discussed in the previous sections into a three-stage performance, namely fund-raising performance, investment performance and post-investment performance and exit performance. The summarise of three-stage performance is based on venture capital firms'

operation process with the support of interview and literature (Ramsinghani, 2014; Cumming, Grilli and Murtinu, 2017). It will be a management structure. i.e. performance tree in our sub-performance management system design (see Figure 7-3). The details of the three-stage performance are described below.

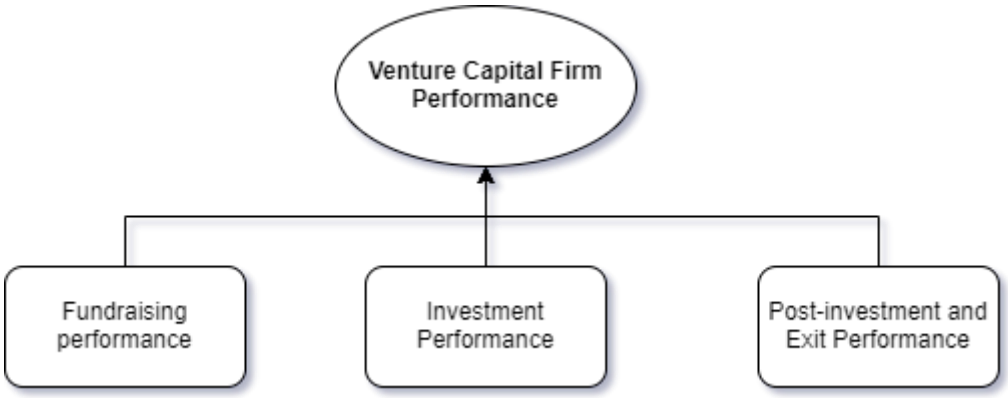


Figure 7-3 Venture Capital Firm management structure

1) Fund-raising performance.

In China, the capital in venture capital firms often comes from wealthy individuals, state funds, pension funds, insurance companies, foundations, and other pools of cash. The owners of these capitals, that is, investors, are looking for higher returns than they can get from usual investment channels, e.g. stock market, but want to minimise risk at the same time. To raise funds, the venture capital firm has to convince investors to participate. The fund-raising person often caries out tasks such a creating a private placement memorandum, putting together a pitch deck, writing up an executive summary, and pitching over and over to potential investors. Fund-raising is often a hard job for new staffs as it needs the person has sufficient social resources and an excellent reputation in the industry. In addition, it can often take a long period to collect enough money to close a fund or start an investment project. The amount of capital raised is the outcome of the fund-raising performance. In fund-raising performance management, not only venture capital internal factors, such as staff abilities, experience and social resources but also the economic situation, capital market, the degree of matching between investor preferences and venture capital characteristics will all become important factors affecting performance outcome. Although some external factors are difficult to control,

this requires fundraisers to make full use of their experience, persuasive ability, and guanxi to obtain funds from target investors. For performance management, this will involve personnel recruitment and training to improve the firm's ability to obtain capitals.

2) Investment performance

Venture capital investment processes mainly involve screening and valuing their investment targets, undertaking due diligence, writing complex contracts, making the investment deal.

The common aims of the investment process performance outcome are funding efficiency, accessing to innovative projects with value-added potential, reducing the investment risks. The outcome of investment performance is not only related to the internal operating factors of the investment teams, but more importantly, is directly affected by the actual performance of the invested companies. Meanwhile, in addition to the efficiency of capital and the management and financial service fees can be achieved in the short term, the realisation of other expected performance outcomes often takes a long time. This brings difficulties to the setting up performance objectives and the selection of performance management approaches in the investment stage.

3) Post-investment performance and exit performance

After the investment process, taking part in the management and monitoring the performance of the company invested are very important operation to a venture capital firm. They are key factors to achieve the success of an investment project and reduce investment risks. First, the venture capital firm needs to determine the level of involvement they will have with the company post-investment. This includes how frequently the firm will receive financial updates and of what type from the invested company. Then, the firm needs to decide whether they will have a board seat or other official role in the invested company. Even without a board seat, the firm needs to maintain a close relationship (formal or informal) with the invested company to provide advice, value-added services. In the post-investment stage, staying involved with the invested company and monitoring its progress can effectively influence the level of success of the venture capital investment.

Investment exit is the last and most critical step in the venture capital investment. Exit process mainly involves two key factors: exit at the appropriate time and using the best exit strategy. The time to the exit should be planned to match the market dynamics as they change over the life of the investment. Exit modes include Mergers and acquisitions, IPO, management buyout,

etc. In China, IPO is often the best option to gain maximised profits of venture capital investment.

Often, the outcome of post-investment performance and exit performance is financial profits. To manage the post-investment performance and exit performance, the decision-making process, exit operation and the quality of value-added services often are the key factors.

7.3.2 Design a sub-performance management system

Through the discussion of the previous sections, we have determined a management structure of three-stage performance from the perspective of the venture capital investment processes for the purpose of financial objective. In this phase, we need to design how to achieve and enhance the financial objective by global coordination.

However, our interviews found that, unlike the performance management in traditional industries, venture capital firms have not taken strict control of employee's specific activities in the venture capital investment process to improve individual and organisational performance. This finding means that the ideal performance management approaches could be non-behaviour based in the venture capital industry. In the interview, most of the investment managers often mention the importance of the non-behaviour factors, for example, various guanxi (i.g. investors, government, R&D, stock market), political resources, etc. (will be discussed in detail later), in the generation of venture capital firm’s financial performance.

From the perspective of the performance tree management theory, this means that non-behavioural factors could lead us to find critical and practical global coordination approaches. However, it is not to say that in the venture capital industry, behavioural factors do not need to be emphasised in performance management, but they may be too flexible to be specified, at least at the general level of organisational performance management.

In addition to the information gathered from the interview, we go for literature review and find a large number of studies both in China and in other countries show that social capital and human capital are the main factors to the venture capital firm’ financial performance (Nielsen, 2015; Shane and Stuart, 2002; Dai, Wei and Yu, 2012; Pan, Zhao and Wójcik, 2016; Cao *et al.*, 2018; Milosevic, 2018). From the interview, many of the venture capital firms indicate that although they have realised the importance of human and social capital for the firm's financial performance, they have not an effective and comprehensive way to deal with the development

and improvement of human and social capital that could cover the entire organisation and all the staffs in their existing performance management systems. In another word, the reality is, the majority of the venture capital firms developing their competitiveness of human and social capital are heavily reliant on the personal characteristics, resources and abilities of the few top executives, e.g. General Partners (Managing Partners, Partners, Venture Partners), Investment Principles. The 11 venture capital firms understand it is necessary to enhance their human and social capital from the overall level besides the executive's level. Therefore, they support our idea of developing a sub-performance management system to improve their overall level of human and social capital for financial objective achievement.

1) Humane capital in venture capital firms

Human capital is a broad concept, yet the core contents often are skills and knowledge gained through formal education and professional experience(Becker, 1964; Wright, Smart and McMahan, 1995). In many performance management studies, human capital is considered as one of the key factors for achieving organisational performance (Felício, Couto and Caiado, 2014). The importance of skills for achieving and enhancing individual and organisational performance development has been amply documented.

More specifically, human capital is believed to be critical for various aspects of many firms' development and success, such as opportunity recognition (Gruber, MacMillan and Thompson, 2012; Marvel, 2013), radical innovativeness (Marvel and Lumpkin, 2007), access to external financial resources (Beckman, Burton and O'Reilly, 2007), exploiting risky opportunities (Dencker and Gruber, 2015), etc. The importance of the human capital for achieving firm success is realised not only on the individual level (Dencker and Gruber, 2015) but also the team level (Schjoedt and Kraus, 2009). For example, the previous experience of investment managers in venture capital firm is found to be an important determinant of their industry investment selections (Knockaert, Clarysse and Lockett, 2010) and the level of involvement in developing their portfolio companies (Knockaert *et al.*, 2006). Just as the individual level of human capital, better and higher human quality of venture capital investment teams could induce better performance at all stages of the venture capital investment, especially in the post-investment management phrase (Dimov and Shepherd, 2005). It is even suggested that the performance of the venture capital firm is strongly dependent on the human capital of their teams (Gruber, MacMillan and Thompson, 2012).

Although human capital seems very important to achieve organisational objectives and performance, Davidsson and Honig (2003) indicated that human capital alone is not enough to ensure success. They believe that, only when applied in the context of a relevant social structure, the contribution of human capital factors can be fully realised to achieve successful results.

2) Social capital in venture capital firms

Social capital refers to the stock of social resources embedded in social relationships (Min, Kim and Chen, 2008; Nahapiet and Ghoshal, 2009) and the shared norms, values and understandings that facilitate cooperation within or among groups (Harper, 2002). The social relationship could facilitate the exchange/combination of valuable resources from social units, such as information, trust, influence and solidarity (Bourdieu, 1986; Burt, 1992; Nahapiet and Ghoshal, 2009). Social capital is also believed can enrich other forms of capital, such as human capital or intellectual capital (Cao *et al.*, 2018). To some extent, the acquisition of social capital seems to be strategic behaviour (Gulati, 1999).

Social networks represent nodes of people and/or organisations, tie to each other on the basis of their social relationships, such as interpersonal and organisational networks, which are also believed as a key factor for realising their objectives (Wasserman and Faust, 1994). In a venture capital firm, the social networks of top managers and investment managers are essential to the firm's development. For example, well maintained social relationships could enable the firm to access venture capital funding (Beckman, Burton and O'Reilly, 2007) and benefit from higher valuations (Hsu, 2004), which are believed to be a core determinant of the middle-to-long term performance of venture capital firms (Shane and Cable, 2002).

Based on the above literature review and discussion with some of the 11 venture capital firms' managers, we decide to set up global coordination approaches of human capital and social capital development.

After the development of management structure and selection of global coordination approaches, we design a sub-performance management system for the 11 venture capital firms to achieve and enhance their financial objective (see Figure 7-4).

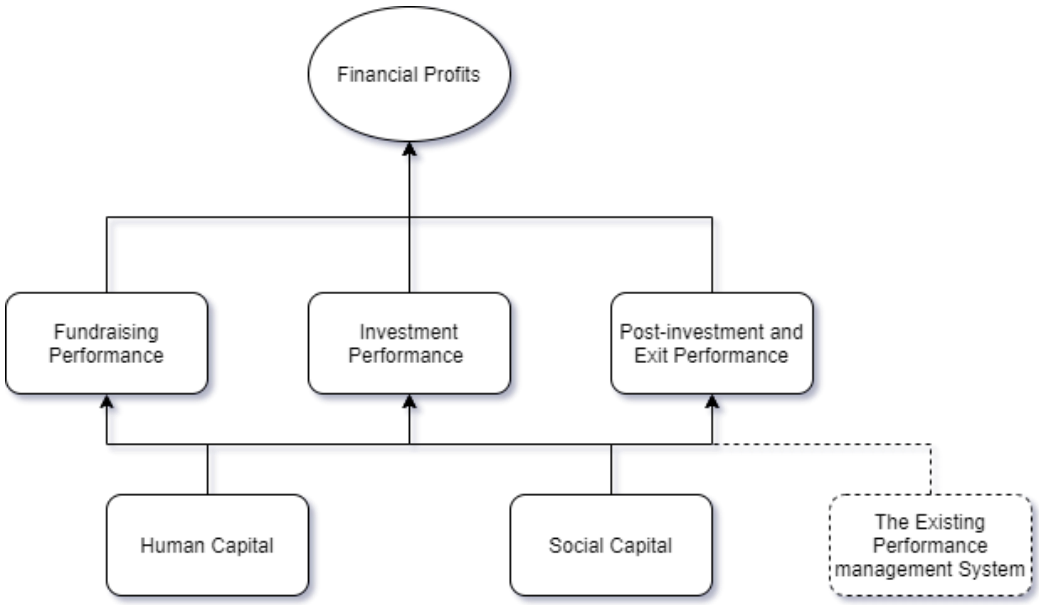


Figure 7-4 The designed sub-performance management system for the 11 venture capital firms

This designed sub-performance management system implies the new Performance Tree Management Framework. In this system, the three stage-performance are virtual performance units, and their processive relationship provides a management structure for performance tree management. The human capital and social capital represent two categories of global coordination approaches that are selected to manage the virtual performance units. This virtual performance tree management system reflects and meets the demands of the 11 venture capital firms. In the one hand, this sub-performance management system is designed on the basis of the investment process, which meets the firms' demands on strengthening investment process management. On the other hand, it meets their requirement of an accessible and flexible performance management system as the sub-performance management system only involves two key areas to carry out performance management.

7.3.3 Enrich the designed sub-performance management system

The above sub-performance management system we designed is in a very much abstract level. In the next step, we will enrich the contents of this system, in particular, the global coordination approaches. Therefore, we will find out what kind of human capital and social capital are desirable in the venture capital industry, what corresponding key factors are critical for achieving and enhancing the financial objective, and how to achieve them. Hence, we will find

out some key factors in human capital and social capital categories through literature and interview, and then develop corresponding key processes to achieve them.

To enrich the sub-performance management system, we need to clarify more detailed management contents and corresponding tasks for performance management practice in the respects of human capital and social capital. We understand that the practical management contents for the 11 venture capital firms in their performance management could be rich and complex. As a performance management improvement project, we intend to first propose some focal points (will be discussed in detail in the following sections) in a generic level, i.e. key factors, that can subsequently help us develop corresponding performance management tasks for guiding the venture capital firms to implement their sub-performance management systems effectively. Hence, we first summarise some key factors, which are often mentioned to be important for the venture capital firms' financial performance by the managers in the interview and have been clarified in the relevant literature. Then, the corresponding management tasks are identified for the sub-performance management system implementation.

It should be noted that the enriched sub-performance management system will still be very generic. In practice, the venture capital firms have to solidify the specific global coordination approaches according to their own business context. Nevertheless, the enriched sub-performance management system could help them to carry out implementation more conveniently.

7.3.3.1 The key factors of human capital and social capital in venture capital investment

1) Key factors for achieving fund-raising performance

- Reputation

The reputation of venture capital firms is one of the important considerations of investors and capitalists when they are asked for raising funding (Nahata, 2008). Business reputation is a perceptual representation of a firm's actions and results that crystallises the firm's potentialities to deliver valued results to its stakeholders (Fombrun, Gardberg and Barnett, 2000). A great number of researches show that reputation is a success factor in venture capital fund-raising. People widely consider that venture capital fund-raising is predominantly determined by the individual venture capital firm's track record and reputation (Balboa and Martí, 2007; Barnes and Menzies, 2005; Gompers *et al.*, 1998; Kaplan and Schoar, 2005). the venture capital firms with a good reputation often have better opportunities to get funding in the fund-raising stage. There could be several important measures of reputation, such as the venture capital firm's age

and the capital value under management. Early-established and larger-scale venture capital investment organisations often have more excellent reputations. In this way, these venture capital firms may, therefore, easier to receive larger capitals' interests and commitments than similar younger firms.

In the interview, managers of different venture capital firms all express that they pay more attention to building the firms' reputation rather than pursuing financial benefit only. The reason is that, in China, how good the venture capital firm appears to be, often lead to the success of fund-raising even shelter the influence of the firm's actual performance.

- Social network/Guanxi

Some studies have shown that sometimes access to capital is not driven by the firm's operational performance, but rather by organisational and personal networks of venture capital firms and their managers. Evidence shows how powerful professional social networks can facilitate fund-raising (Beckman, Burton and O'Reilly, 2007; Milosevic, 2018). In this sense, some researchers believe that venture capital industry is a networked industry (Echols and Tsai, 2005), and venture capital syndicates are an important mechanism to access network resources (Gargiulo and Benassi, 2000).

In China, researchers have pointed out that to build up and cultivate social networks, which is often called as guanxi, as finding venture capital needs frequent personal and organisational level interactions (Zhang, 2011; Batjargal, 2007; Kambil, 2006). In social science literature, the meaning of Guanxi network is similar to the concept of social network (Wang and Hsung, 2016). In a more rigorous definition in Chinese cultural context, Guanxi refers to not only a static relationship in English term, but also a dynamic process of ongoing manufactured relationship with reciprocal obligation and indebtedness (Yang, 1994; Guthrie, 1998; Bian and Zhang, 2014). The Guanxi network not only takes time to build up but also needs resources and strategies to regularly maintain over time (Gold, Guthrie and Wank, 2002).

In addition to the social capital factors, some researches propose a few human capital factors for achieving fund-raising performance. For example, some studies find communication is another crucial factor, especially in small fund-raising for a small investment. The fundraiser should explain why the investment project is important or different from other projects in the market and why prospective investors should get behind it. The communication could build interaction between venture capital firm and investors with comments and updates through the

social media platform. More specifically, showing a potential investor that the ideas are well structured, and the technical characteristics of the product are in detail also could increase the probabilities of successful fund-raising (Moutinho and Leite, 2013). Moreover, the degree of openness of the venture capital firm during the due diligence and the offered terms and conditions all can influence the venture capital firm get a better fund-raising outcome (Kollmann, Kuckertz and Middelberg, 2014).

However, by interview, although venture capital firms' mangers admit the importance of the human capital factors, they often do not consider they are determining factors in the fund-raising stage.

2) Key factors for achieving investment performance

- Industry-specific capabilities

Hellmann (2000) proposed that the investment performance of venture capital firms is highly dependent on their teams and their ability to select portfolio firms and arrangements in an optimal manner. A comparison case study shows that US venture capital firms often have sharper screening abilities than their European counterparts, which leads to a higher degree of translating initial investments and funding frequency into success (Hege, Palomino and Schwienbacher, 2003). Specifically, the investment projects for a certain number of start-up companies are usually far from a public offering and often have no revenues or marketable products when venture capitals become interested in them. Hence, the essential requirement of a good venture capital firm is to have the ability for addressing the screen and sorting problem, i.e., separating the best entrepreneurial firms from marginal ones (Sahlman, 1990).

In addition, the ability for recognising and exploiting opportunity (Gruber, MacMillan and Thompson, 2012; Marvel, 2013), identifying risks (Dencker and Gruber, 2015), radical innovativeness (Marvel and Lumpkin, 2007), and across occupations abilities (Gathmann and Schönberg, 2010) are often the other types of critical factors for achieving and enhancing investment performance. Moreover, other studies suggest the construction and characteristics of entire teams are the important factors for firm success (Amason, Shrader and Tompson, 2006; Gruber, MacMillan and Thompson, 2012).

- Experience

Experience crossing occupations is extremely important to the success of the selection of portfolio ventures in venture capital firms (Gathmann and Schönberg, 2010; Zarutskie, 2010;

Milosevic, 2018). This accumulated experience is often linked to the tasks performed on the job rather than to the firm or the industry (Gibbons and Waldman, 2004).

There are higher uncertainty and complexity in venture capital firm selection the portfolio firms' decision-making processes. These uncertain and complexity factors could bring significant risks to venture capital investment outcomes. Therefore, how to make good investment decisions to avoid risk is the most important step in the whole investment process. In reality, the partners or top managers of a venture capital firm must have rich investment and fund management experience, which can have a positive influence to reduce venture capital investment lose and use to optimise the investment return (Lauterbach, Welpe and Fertig, 2007).

- Co-investment network

Another important factor for achieving the desired investment performance is establishing and involving in investment networks. Over the past two decades, many venture capital firms have leveraged their prominence to build co-investment networks (Dai, Jo and Kassicieh, 2012; Jääskeläinen and Maula, 2014). By taking advantage of these networks, these firms gain access to higher investment returns and broader diversification opportunities in venture capital investment. Rosiello, Avnimelech and Teubal (2011) suggested that co-investment by different venture capital firms not only helps to develop the venture capital firms but also increases the rate of success of their projects. In China, cooperation through co-investment network has become an important success factor of investment in the venture capital industry. A venture capital co-investment network is formed out of a pattern of social capital exchange between venture capital firms and projects. By taking advantage of this network, Chinese venture capital firms diversify risk, share resources, further to enhance investment performance (Cao *et al.*, 2018).

3) Key factors for achieving post-investment and exit performance

- Industry-specific management abilities and experience

In addition to providing funding, venture capital firms need to provide value-added services to enhance the firms and venture capital-backed enterprises' performance and reduce the risk of an investment. Most of the venture capital firms believe that the value-added service is as important as the capital infused (Gompers, 1995). The active contribution of venture capital firms to the value creation process, through value-added service, is an important theme in the theoretical venture capital literature (Casamatta, 2002; Cornelli and Yosha, 2003). The more

management abilities and specialised experience a venture capital firm has, the firm can gain more advantage over others (Cao *et al.*, 2018). Therefore, industry-specific management abilities and experience are critical for the venture capital firms in the post-investment stage. Specifically, venture capital firms use their industry-specific management abilities and experience to help the venture capital-backed enterprise in strategic and operational planning, personnel and supplier selection, marketing, financing, monitoring, and even assuming managerial roles where necessary (Gorman and Sahlman, 1989; Macmillan, Kulow and Khoylian, 1989; Barry *et al.*, 1990). The venture capital-backed enterprises who have limited managerial and business skills could benefit from the strategic guidance and other managerial inputs provided by venture capital firms (Rock, 1987).

Therefore, the value-added service based on the venture capital firms' strong management abilities and rich experience, can further accelerate the growth and performance of those venture capital-backed enterprises. A comparison study indicates that the US venture capital firms are more sophisticated on management abilities to support their investment strategy than their European counterparts and this difference in sophistication explains why the US venture capital firms' performance are often better than the European counterparts' (Hege, Palomino and Schwienbacher, 2003).

- Social relationship

One of the venture capital investments' aims is generating a return through "exit", which often makes the major contribution to its overall performance. There are mainly three ways of the venture capital existing process. One is the venture-backed company selling shares to the public for the first time in an initial public offering (IPO), then the venture capital exits. Another is doing a merger and acquisition, often be called trade sale, by other company. The third way is the venture capital firm selling its rights in the private equity secondary market.

In China, IPO is a major and favourite way for venture capital firms to exit from their investments (Pan, Zhao and Wójcik, 2016). Social networks or Guanxi is believed as extremely important in venture capital investment activities, especial in IPO process (Batjargal, 2007; Zhang, 2011; Kambil, 2006).

In China, not the stock exchanges, but the Chinese Securities Regulatory Commission (CSRC) is the authorised organisation for reviewing IPO applications and approval. Moreover, the local and central government agencies are often engaged in a different stage of the IPO process. In

short, domestic IPOs are highly regulated and effected by governments of different levels (Pan, Zhao and Wójcik, 2016). In this sense, people believe that political ties, political social network or guanxi are extremely important in IPO applications (Güçbilmez, 2014; Tan, Huang and Lu, 2013; Jiang *et al.*, 2014). Venture capital firms with better access to key resources via political connections or having better social networks/Guanxi are more likely to get their invested companies approved and listed quickly (Anderson, Chi and Wang, 2015).

In addition, a well-maintained social relationship could help venture capital firms improving their post-investment management. For example, a newly established venture capital may have insufficient specialise knowledge and abilities to add value to its investee company. Nevertheless, by establishing a close social relationship with other cooperation partners, the venture capital firm could rely on its partners' expertise to add value to the investee company and to learn from its peers (Al-Laham, Amburgey and Bates, 2008).

- Geographical proximity

In China, people believe that the geographical proximity of venture capital firms' location might be another important factor in venture capital investment and management practices. As it has been documented that venture capital activities are highly agglomerated in selected regions of a country, the geographical proximity could, therefore, make the frequent personal interactions and social capital or guanxi building and cultivating convenient, further, to promote the performance of a venture capital investment (Batjargal, 2007; Zhang, 2011; Kambil, 2006).

A study on China finds that venture capital activities are highly concentrated in Beijing, Shanghai and Shenzhen (Zhang, 2011). In detail, Beijing, Shanghai and Shenzhen are the top three cities with the largest number of venture capital firms. About 67% of the total number of investment deals and about 70.1% of their value made by venture capital firms are mostly from these three cities. The study also shows that key resources related to domestic IPOs are located in Beijing and Shenzhen.

Similarly, geographical proximity is an important factor for venture capital firms in other countries. For example, the venture capital firms and investment activities are extremely concentrated in San Jose-San Francisco, New York and Boston in the US (Lerner, 2010; Sorenson and Stuart, 2001), while in the Greater London and South East England in the UK (Mason and Harrison, 2002; Martin *et al.*, 2005).

By the above analysis and discussion, we enrich the sub-performance management system designed previously with more details (see Figure 7-5).

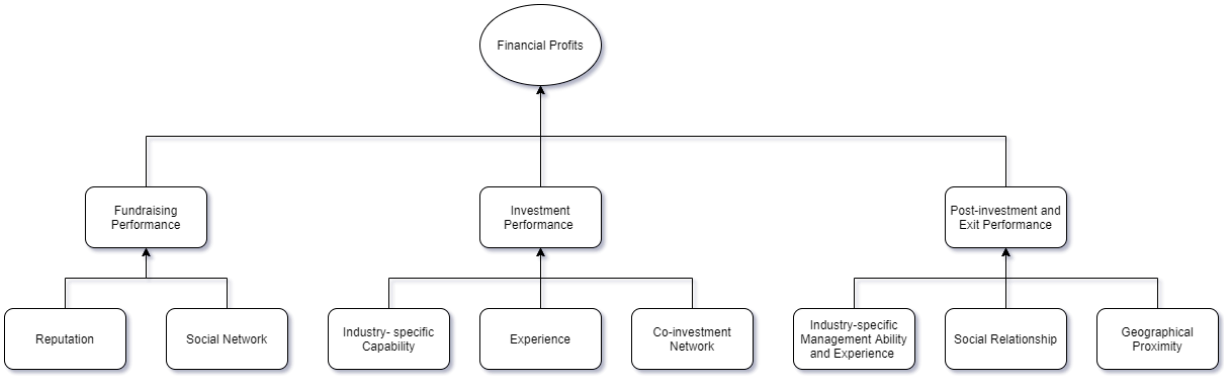


Figure 7-5 The enriched sub-performance management system for the 11 venture capital firms

7.3.3.2 Select the key processes and KPIs for the implementation of the new framework

In this stage, we propose some key processes for attaining the desired human capital and social capital results, respecting to the key factors summarised above, based on the interview and some literature. From the perspective of the Performance Tree Management Framework, all these key processes are the specialised global coordination approaches for achieving the desired financial performance in the 11 venture capital firms. Further, corresponding KPIs are developed by the 3E methodology (Liu *et al.*, 2010) as a guide for the 11 venture capital firms to monitor their performance management. These key processes and KPIs are supported by most of the mangers in the 11 venture capital firms.

1) Building reputation

Building a reputation is a hard thing to do, yet it is something critical for venture capital firms. The industry experts believe that venture capital reputations are often built on one or two good investments (Zider, 2000). Hence, we suggest that venture capital firms need to strengthen the selection and approval process for quality projects that have long-term values, rather than have short-term profit only. In the interview, many successful firms emphasise the importance of the selection of investment projects for building a good reputation.

Further, we suggested venture capital firms use a variety of strategies and activities for attracting stakeholders' attention and creating positive perceptions about their firms. We recommend venture capital firms using symbolic activities (Petkova and Rindova, 2008) for

building their reputation-building. The primary purpose of the symbolic activities is to attracting stakeholders' attention to the success of firms invested startups and, to cultivate stakeholders' positive expectations for the firms. These type of reputation-building activities often include: syndicating with more experienced venture capitalists; attending trading/industry shows and investment summits; presenting self or participating forum at relevant industrial conferences; being positively reported in the news, TV programs, social media, industry journal and newsletters; hiring a professional public relations agency in the early stage of the firm development; communicating to stakeholders the firm's vision and achievement; placing advertisements, distributing brochures and handouts that illustrate the firm's investment team's skills and capabilities, etc.

Key process:

- Select and approve investment projects through comprehensive evaluation and analysis
- Organise and participate in various reputation-building activities

2) Improving fundraising via social networks

Social networking can help venture capital firm build a professional investment network and relieve a few of the challenges of classic funding. Researches indicate that social network actions and the capability to acquire financing are positively associated (Jin, Wu and Hitt, 2017).

What venture capital firms need to do is plan how they can continue to expand their social circle and how they can use these social relationships to get funding. For this reason, the traditional approach is to participate in various corporate events or investment project promotion meetings, and to meet more professionals who are resourceful and from different backgrounds. In the internet age, venture capital firms can select some correct social network stations for promoting themselves and then could gain the most followers or possible for followers. In this sense, venture capital firms should recruit professionals with social network platform promotion experience, or outsource this work to professional companies.

Key processes:

- Participate in various corporate events or investment project promotion meetings
- Recruit professionals with social network platform promotion experience

3) Improving industry-specific capability

The industry-specific capability often includes the ability of portfolio firms selection and arrangements, the ability of investment project screening, the ability for recognising and exploiting opportunity, the ability of investment risks identification, etc.

We suggest three ways to improve this capability for venture capital firms. First, venture capital firm can introduce high-capacity LPs and professional executives. Second, venture capital firm can enhance its staffs' professional competencies in the individual level through training. Third, the venture capital firms also can strengthen the comprehensive capabilities from the investment team level. There are various methods for capability enhancement, such as master with apprentice mode, regular training, skill-building and investment project seminars, etc.

Key processes:

- Introduce high-capacity LPs and professional executives
- Enhance its staffs' professional competencies in the individual level through training

4) Experience

Venture funds are often classified as generalist or specialised. From the early days of venture investing until relatively recently, venture capital firms have increasingly inclined to invest in specific areas. In fact, the 11 visited venture capital firms all have their dedicated and specific investment areas, such as smart home industry, health industry, biomedical industry, artificial intelligence, etc. Therefore, the investors and investment project teams of venture capital firm should be very familiar with the own firm's key investment areas and understand the latest technological developments and trends in the corresponding industry.

We recommend two approaches to promote venture capital firm's investment experience and industry experience via recruitment. First, recruiting professionals with abundant investment or cross-industries experience will be very much helpful. Furthermore, when recruiting new entrants, those with a bachelor's degree in science or engineering and a graduate degree in finance are more desirable. Meanwhile, people with non-financial majors yet have a certificate such as Chartered Financial Analyst (CFA) or financial risk manager (FRM) are also the key recruitment targets.

Key processes:

- Recruit professionals with abundant investment or cross-industries experience
- Recrute inter-disciplinary talents

5) Developing co-investment-network

To establishing or joining a co-investment-network can increase the venture capital firms' investment opportunities, reduce investment risks, and improve investment success rates. A large investment firm usually leads such a network, and other small firms follow. The success of a co-investment-network depends heavily on trust between members. In fact, co-investing with unfamiliar institutions (or without co-investment before) could bring higher risk to the venture capital firm.

Therefore, the establishment or joining of co-investment-network should pay attention to the following some key points: (1) Priority should be given to familiar venture capital firms (co-investment many times) as its partner; (2) Cooperation with new venture capital firms is best done with acquaintance referrals; (3) High-status venture capital firms or mature venture capital firms are desirable partners.

Key processes:

- Join professional or well-known co-investment networks
- Establish linkages with high-status venture capital firms or mature venture capital firms

6) Industry-specific management abilities and experience

The Industry-specific management abilities and experience refer to the management capabilities and experiences of the industry in which the invested company is located. These capabilities and experiences can enable venture capital firm to provide management advice and assistance to its investee companies, or provide advanced management approaches that can further improve the performance of investee companies. Therefore, venture capital firm often needs to have a post-investment management team of a large size, and many people in the team should have rich practical industrial operation and management experience. From the perspective of organisational structure, high-performance venture capital firm often has an upside-down pyramidal structure (Wasserman, 2005), that is, the number of general partners or investment managers in the company greatly exceeds junior employees. This phenomenon exists because the venture capital firm is a knowledge-intensive organisation whose business involves more esoteric expertise than standard knowledge. Mostly, industry-specific management abilities and experience often gained vis recruitment of professional management personnel with practical skills.

Key process:

- Recruit of professional management personnel with practical skills

7) Social relationship

The social relationship here mainly refers to the relationship between the venture capital firm and the relevant authorities, such as governments, the Chinese Securities Regulatory Commission (CSRC), etc., when the IPO activities are carried out in the exit stage of investment. Specifically, a better-quality relationship with CSRC official could positively influence the IPO approval decisions as we fund in the previous discussion.

We recommend that venture capital firms need to establish good political connections with governments at all levels and the CSRC. For example, venture capital companies can approach political resources and build political relationships in various ways, such as hiring former government officials, becoming representatives of the People's Congress, or members of the People's Political Consultative Conference, etc.

Key processes:

- Regular visits CSRC and relevant government departments
- Establish linkages with (former) senior officials

8) Geographical proximity

Geographical factors have a significant positive effect on the IPO pass rate of investee companies, that is, companies in regions with higher political energy, or in areas where venture capital firms are gathered, have greater IPO pass rates.

Specifically, when setting up venture capital enterprises, they should consider positioning them in Beijing, Shanghai, Shenzhen and other cities as much as possible. For venture capital companies not in the above cities, if the economic conditions are good, liaison offices can be set up in the above cities. If the economy is not allowed, they can regularly visit relevant government agencies or peer units in the above cities to strengthen Communication with regulatory authorities and timely grasp of policy direction and industry development trends.

Key processes:

- Set up liaison offices in core cities if necessary
- Regularly visit relevant government agencies or peer units

Then, we propose the corresponding KPIs according to the 3E methodology (Liu *et al.*, 2010) for the 11 venture capital firms to monitoring their performance management (see Table 7-1). It should be noted, the identified key processes are, to some extent, different from traditional operational processes. Hence, it could be a challenge for the venture capital firms and us to set up precise and effective KPIs. The KPIs we presented in the table below could be seen as references and recommendations for the venture capital firms to implement the designed system conveniently.

Table 7-1 Key processes and KPIs of the designed sub-performance management system

	Key Factors	**Key Processes**	**KPIs**
Fundraising Performance	Reputation	Select and Approve Investment Projects	The number of successful projects
		Organise and Participate in Reputation-building Activities	Customers satisfaction
	Social Network	Participate in Promotion Meetings and Events	The number of participated meetings and events
		Recruit Social Network Specialists	Recruitment satisfaction
Investment Performance	Industry-specific Capability	Recruit Senior Executives	Recruitment satisfaction
		Training staffs	Training plan completion rate
	Experience	Recruit Cross-industries Professionals	Recruitment satisfaction
		Recruit Inter-disciplinary Talents	Recruitment satisfaction
	Co-investment Network	Join Professional or Well-known Co-investment Networks	The number of co-investment partners
		Establish Link with High-status Venture Capital Firms	Visibility in the industry
Post-investment and Exit Performance	Industry-specific Management Ability and Experience	Recruit of professional management talents	Recruitment satisfaction
	Social Relationship	Regular visits CSRC and relevant government departments	The number of visits
		Establish linkages with (former) senior officials	Visibility by the governments
	Geographical Proximity	Set up liaison offices in core cities if necessary	The coverage of liaison sites in the core cities
		Regularly visit relevant government agencies or peer units	The number of visits

At the end of this case study, our designed sub-performance management system is reviewed by some of the 11 venture capital firms. Their overall evaluation of this design is that the designed performance management system conforms to the fundamental characteristics of the venture capital industry, integrates the best practices in the industry for achieving investment financial objective, and can help each firm effectively establish or improve its own performance management system.

In sum, through this case study, we design a cross-organisations performance management system based on the Performance Tree Management Framework. This designed performance management system could be effectively used in the 11 venture capital firms, even for the venture capital industry. The result of this case study shows that the Performance Tree Management Framework can be used to design a performance management system not only for a single company but also for a group of organisations with common objectives and operations. Moreover, we find the global coordination has more extensive application prospect, that is application across-organisations.

Chapter 8 Conclusions and Future Research

8.1 Conclusions

This thesis begins with a systematic review of the existing literature on organisational performance management, which covers performance and performance management definitions, performance management frameworks, and pressing issues in the current performance management research and practice.

It is noticed that modern businesses, especially those in the emerging industries, have a compelling need for effective and flexible performance management frameworks to help them improve performance management. The main reason for this call for attention is because the traditional performance management frameworks, although had countless successful applications, still are unable to reflect the new managerial demands in the fast-developing environment in the new era. Based on the above understanding, the overall aim of this study is to develop a new performance management framework that can help and facilitate modern organisations to carry out more successful performance management.

This study started with a literature review on performance and performance management frameworks. A comprehensive typological literature review is carried out to analyse the characteristics and features of the contents of performance in management, the existing performance and performance management definitions, and performance management approaches and frameworks. The traditional performance definitions are mostly described as actions/processes, results, or their combination. In reality, the performance in management practice embodies various contents which are far beyond only action and results. Scholars and practitioners have different understandings of what performance is from different perspectives. The imperfection of the performance definition highlighted a gap in the current performance management study.

The review of the literature also revealed two main issues in the traditional performance management frameworks. One of the issues is that the traditional performance management frameworks often overemphasise on managing the designed actions or processes according to organisational objectives and strategies, which causes the overlooking of the possible key non-

behavioural factors in performance management. Another issue is that this action/process-oriented performance management logic is unsuitable for the vast growing knowledge-intensive industries, because it is difficult to predetermine desired actions/processes when there are a lot of uncertainties in the business environment. Based on the literature review of the existing performance and performance management frameworks, this study argues that the underlying cause of the above-mentioned issues is that the imperfection of existing performance definitions which could have restricted the broader development in the performance management framework both in practice and research.

To give a satisfying definition of performance, this study tried to summarise all-encompassing contents of performance and its managerial characteristics. Based on the discussion of the literature, as well as mentioned by a number of performance management researches who implicitly indicated the performance often involves expected business results and their causes, the concept of causality hence was explicitly introduced into performance definition. Following the understanding of the causality, the new definition of performance is generated by using the CR paradigm. Performance is selected desirable outcomes and their causes that are projected on causal factors and causal mechanisms. Depending on what level of cognition, the new definition of performance can be very abstract or specific. The new definition of performance could explain and unify most of the existing performance definitions in management research and business practice. Based on the newly defined performance, organisational performance and performance management were redefined.

After redefining performance, organisational performance, and performance management, this study further investigated the detailed performance management tasks from the theoretical perspective. At this stage, some related theoretical concepts were proposed, such as performance network, performance unit (actual or virtual), performance set, performance map. Then, two fundamental concepts, i.e. global coordination and performance tree, are introduced for establishing a performance management framework. Specifically, this study argues the importance of the overarching level coordination of each management branches in organisational performance management if all the local management is running perfectly. Therefore, this type of coordination is posited as global coordination, which is believed to be a key causal mechanism throughout the entire performance management system. Another new concept we proposed is the performance tree, which is a part of performance network that can be ethically and economically managed by organisations.

Following the redefinition process and theoretical conceptualisation, a new performance management framework is introduced, named as Performance Tree Management Framework. This framework intends to enhance organisations' performance by developing performance tree with key causal factors, interacting with organisational objectives and strategies, and then managing the performance tree by using global coordination.

Table 8-1 lists all the redefined performance, organisational performance, performance management, and newly proposed a series of performance tree management related concepts, such as performance network, performance tree and performance units, etc.

Table 8-1 List of newly developed definitions and concepts

Concepts in Performance management (Some of them are newly proposed in this research)	**Definitions and Interpretations**
Performance	Performance is selected desirable outcomes and their causes that are projected on causal factors and causal mechanisms.
Causality Network in Performance	A multi-layer causality network in performance is constructed with different layers of causal factors and causal mechanisms, where the causal factors are nodes, and causal mechanisms are the logic links.
Organisational Performance	Organisational performance is selected desirable outcomes from organisational objectives and strategies, and their causal factors and causal mechanisms that can be ethnically and economically understood and managed.
Performance Management	Performance management in an organisation is to develop desirable outcomes and corresponding causal factors and causal mechanisms both in line with organisational objectives and strategies, and further to achieve or enhance these outcomes by managing causal factors and causal mechanisms (by either adjusting or pursuing them).
Performance Network	Performance network is a causality network constructed with selected desirable outcome itself and its cognisable, specific and achievable causal factors and corresponding causal mechanisms.
Performance Tree	Performance tree is a performance network only contains key causal factors and causal mechanisms that people can ethically and economically manage.

Performance Units	People often only select some groups of limited causal factors cognised and convenient for management, to form the performance generation units to manage, to be called performance units.
Actual Performance Unit	A performance unit that is coincided with an existing organisational unit refers to an actual performance unit.
Virtual Performance Unit	A performance unit that is created differently from existing departments or actual units in a real organisation refers to virtual performance unit.
Performance Set	Performance set in a performance unit refers to a series of objectives and corresponding metrics, which are utilised to convey the organisational and unit level objectives and the corresponding metrics for measuring the unit's performance.
Performance Map	A graph mode of representing the performance and its structure which is used above refers to a performance map.
Performance Tree Management Framework	Performance Tree Management Framework is to enhance organisations' performance by developing performance tree, interacting with its objectives and strategies, and then managing the performance tree by using global coordination.
Specialisation (in performance tree management)	Specialisation mainly means grouping expected causal factors and causal mechanisms into different performance units. It is confined by people's cognition and anticipation (point of view).
Global Coordination	Global coordination means coordinating performance from more than one performance units/organisation departments to enhance overall organisational performance.

Compared with the existing performance management frameworks, the networking view of Performance Tree Management Framework provides a more holistic perspective for performance management research and practice, which is more focused on the process of performance generation. Analysing, designing and managing the performance tree could give utmost paths to enhance organisational performance.

This study further discussed on how to develop and manage performance tree using specialisation and global coordination by cross-referencing literature. A set of six global coordination approaches were proposed: 1) Global coordination for accomplishment; 2) Global coordination by rules and culture establishment; 3) Global coordination by standardisation; 4) Global coordination by global mutual adjustment; 5) Global coordination by KPIs/OKRs and performance planning; 6) Global coordination by feedback.

Through profound discussions on the development of Performance Tree Management Framework, the combinations of different performance tree format and global coordination approaches can lead to various existing performance management frameworks. The Performance Tree Management Framework can be used as a template for illustrating existing performance management frameworks and, can also help academics and practitioners to develop innovative and flexible performance management. In order to make Performance Tree Management Framework applicable in practice, different implementation scenarios were discussed.

Finally, two case studies were carried out in China. The results of the first case study showed that the Performance Tree Management Framework was feasible in practice, especially for organisations that find traditional performance management frameworks are not suitable. This framework is also suitable to help organisations build a tailored performance management system to achieve their mid-and-long term objectives. The second case study found that the Performance Tree Management Framework can be used to design a performance management system not only for a single company but also for a group of organisations with common objectives and operations. Moreover, new global coordination approaches were discovered through two case studies. The scope of global coordination approaches was extended from internal organisation to external organisations, from a single organisation to a group of organisations. Through these two case studies, the Performance Tree Management Framework was well applied, and the theory of performance tree-based performance management was solidified and improved.

In sum, through the rigorous theoretical construction and case applications, the newly developed Performance Tree Management Framework is flexible and comprehensive. Performance tree management theory has contributed to the existing body of knowledge in performance management. However, the current framework is not perfect and requires further theoretical and practical improvements. From a practical aspect, we find that the application of the Performance Tree Management Framework is not as easy as the popular BSC model. Specifically, when an organisation utilises the Performance Tree Management Framework to design its tailored performance management (improvement) system, there are at least three main steps. First, the organisation and the project team need to diagnose the organisation's existing performance management system as accurately as possible and to identify the management issues. Second, practical performance improvement objectives need to be determined by the managers and the project team, which may involve long-term planning and

internal conflicts. Third, to find out which global coordination approaches are appropriate for performance management (improvement) system is also challenging. All in all, the design and implementation of performance tree management could involve intensive management and industry-specific knowledge and experience, and they are time-consuming. In addition, not all types of organisations are suitable for performance tree management. Using traditional performance management methods could be more straightforward and effective for some labour-intensive enterprises. For example, the action-oriented performance management framework could be more suitable for managing front-line employee performance.

8.2 Contributions

This study has three main contributions. First, this research theoretically clarifies the concepts of performance and performance management in organisation management that will have notable implications for advancing performance management research and practice. Specifically, the new proposed performance and performance management definitions overcome the limitations of traditional action/process-oriented performance studies and performance management practice. These new definitions use a causality perspective to describe the generation of performance, which extended and deepened the understanding of performance and performance management in a more comprehensive and holistic way.

Second, an innovative performance management framework, namely, Performance Tree Management Framework, is developed based on the new definitions. The framework proposes two critical elements of performance management, namely management structure and global coordination that explain organisational performance generation and management processes. The universal of the Performance Tree Management Framework could be used to explain and exam the existing performance management frameworks and, to help researchers and practitioner to develop new performance management frameworks wherever needed. Different from the most existing performance management frameworks that often depend on the existing organisational chart and focus on operational actions and process design, the Performance Tree Management Framework is better to guide the implementation of performance management for a wide range of organisations for its flexibility and effectiveness.

The Performance Tree Management Framework can be used to design tailored performance management systems for organisations with different characteristics and managerial needs, especially those emerging industries, such as high-tech firms, R&D units and knowledge-intensive institutes. Overall, this performance management tree management framework provides a necessary skeletal structure to enable academia to extend their existing knowledge in the performance management field for future research.

Third, the findings of the two case studies contribute to consolidating the performance tree management theory by developing and testing the implementation of performance tree-based performance management in reality. The two case studies highlight two aspects of practical contributions of the Performance Tree Management Framework. The findings of the first case study contribute to practices by emphasising on how to use non-behavioural factors as global coordination approaches, such as regulation establishment, public relations management, to relieves the dilemma of performant management in innovation and R&D institutes. The contribution of the second case study is to confirm the innovativeness and extensiveness of the Performance Tree Management Framework by developing an intra-organisational performance management improvement system for a group of firms. Meanwhile, the proposed performance management tasks in the second case, such as building reputations, developing social network and co-investment network, achieving geographical proximity, could provide practical guidance for venture capital firms in China to enhance their performance.

8.3 Research limitations

The research is based on the philosophical and methodological principles of Critical Realism (CR). Although the reasons to use the CR paradigm are justified in Chapter One, CR does have some inherent weaknesses that limit the potential of this research. The epistemological assertion of CR indicates that all knowledge is provisional and relative (Mingers, 2006). The provisional feature of knowledge means that all theories or beliefs are not always universally valid, as critical realists believe acquired knowledge cannot be proved to be true all the time. Therefore, in the CR paradigm, preferring one theory over another (e.g. in terms of the comprehensiveness, explanatory power) is believed rationale. In other words, any CR explanation can only hope to be the best explanation until a more valid explanation is presented (Mingers, 2006). Again, the adopted abductive approach lacks the interests on the certainty or

justification of the newly developed performance tree theory. Hence, the research and its outcomes under the CR paradigm greatly depend on the researcher's knowledge and experience. In this sense, due to the limitation of the data access and resources, the performance tree management theory still has room for improvement.

The research is also limited methodologically by its use of a qualitative methodology, namely, case studies. The nature of the qualitative case study method could be criticised for being somewhat unscientific. In this sense, using the qualitative data in abductive approach, there is not always a clear path between the results of the empirical and the mechanisms proposed. There should be some better methods for approaching a CR research project. For instance, a qualitative and quantitative mixed methodology could be beneficial to CR researches (Ackroyd and Karlsson, 2014). The quantitative approaches could help developing researchers' understanding to discover and postulate mechanisms from empirical data, although they are not necessarily able to uncover how the event occurs.

Furthermore, as the case studies of the research focus on two types of knowledge-intensive organisations in China. Therefore, the feasibility of the Performance Tree Management Framework in other industries or in other countries could be further studied and discussed. Moreover, the limited number of case studies cannot really reflect the true effectiveness of the implementation of the performance tree management theory. With the limitation of the case selection as well as the industries involved, the findings may not be sufficient to support the refinement of performance tree design and global coordination approaches. The content of performance tree management framework, the management structure (performance tree and its units) and global coordination as key mechanisms in organisational performance management may go beyond its current scope as other alternative mechanisms, such as an adaptive system can also be considered for future research.

8.4 Future Research

To advance this study, there are some potential directions and topics for consideration for future research. First, over almost a century, various performance management processes have evolved from a relatively simple question of how to manage and measure the organisational or employee behaviours and results for achieving organisational objectives. The current

performance management practices have involved a vast array of multifaceted behavioural and non-behavioural factors that drive performance outcomes, such as political, social, motivational, environmental, practical factors. The "causality in performance and performance management" is a fundamental theoretical innovation in the performance management area. The causality perspective is promising in improving some pressing theoretical and practical issues caused by traditional performance angles and could provide a theoretical skeleton for advancing performance management theories and practices. Therefore, future researches could go further to probe the causality view of performance.

Second, more theoretical and empirical studies could be carried out to refine and consolidate the contents of performance tree theory and develop new performance management models. For example, other possible approaches for managing performance tree could be developed other than the global coordination mechanism. The concepts of actual and virtual performance units in Performance Tree Management Framework could be used to adjust and improve the organisational structure and chart. The different types of performance units that were briefly discussed in Chapter Four could be further studied for designing new performance tree management system. Moreover, to further fulfil the advantage of the flexible nature of Performance Tree Management Framework, innovative performance management model could be developed considering the managerial and operational characteristics of Small and Medium-sized Enterprises (SMEs), which normally have to cope with their fast-changing objectives, strategies and organisation charts.

Third, more specific applicable approaches, especially the global coordination approaches, could be derived from the original Performance Tree Management Framework to help organisations to carry out performance management according to their specific management contexts and demands. In this thesis, two sets of global coordination approaches are developed for knowledge-intensive organisations that cannot represent a large number of emerging businesses. Hence, future research may consider investigating the effectiveness of global coordination's in other types of enterprises. In addition, the need of other industries to improve their performance management system also calls for more research attention, such as performance management for collaborative enterprises (Busi and Bititci, 2006), complex supply chain (Dolci, Maçada and Paiva, 2017), virtual teams (Tan *et al.*, 2019), etc.

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