THE DETERMINANTS TOWARD FOSTERING INNOVATION MANAGEMENT EFFECTIVENESS IN THAI PUBLIC SERVICES : EMPIRICAL STUDIES OF AWARDED ORGANIZATIONS

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A Dissertation Submitted in Partial
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ABSTRACT

Title of Dissertation	THE DETERMINANTS TOWARD FOSTERING INNOVATION MANAGEMENT EFFECTIVENESS IN THAI PUBLIC SERVICES : EMPIRICAL STUDIES OF AWARDED ORGANIZATIONS
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The research studies the determinants toward fostering innovation management effectiveness in Thai public services using and empirical study of awarded organization. The main objectives are 1) to study and examine the characteristics of awarded organizations in public service innovation; 2) to analyze the determinants fostering innovation effectiveness in public service in the awarded organization; 3) to provide policy recommendations in the aspects of the determinants fostering public service innovation for enhancing Thai public service innovation performance.

This research employed a mixed-methods study in order to obtain the quantitative data from 393 employees from three departments: The Department of Fisheries, The Department of Land Transport, and The Department of Medical Science. The quantitative data were analyzed using descriptive statistics, Pearson correlation coefficient, and Structural Equation Modeling (SEM). The qualitative data were collected from in-depth interviews with the head of the division or unit and working-level officers in the front office who directly contacted people and officers that worked in the back office as front office support.

The research found that the following. One, the characteristics of awarded organizations in public service innovation are that the organization has the ability to drive innovation management, the employees have potential innovation management, and public service has been continuously developed. Two, the following factors, innovation strategy, organizational culture, organizational structure, human resource management, and organizational system, were correlated in innovation management

effectiveness with a statistical significance of .05. However, innovative leadership was seen to have an indirect effect on innovation management effectiveness through innovation strategy and organizational culture with a statistical significance of .05. Three, policy recommendations were seen to promote more cooperation in innovation work among the organizations, either among the public sector, private sectors, or universities. Furthermore, the Office of the Public Sector Development Commission (OPDC) should have a system to exchange knowledge through knowledge management between best practices organizations and other organizations that need successful innovation development in order to exchange ideas and experiences from the awarded organization to other organizations. Finally, the government should consider complex legal amendments processes or still pending approval to be implemented successfully, to develop innovation.

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Every organization's present and future are increasingly complicated in terms of management due to rapid economic, social, and technological changes. These changes are related to innovation characterized by increasing knowledge, complexity, and turbulence (Huber, 1984; Ottaviano, 2004). Therefore, the organization possesses innovation capabilities to develop products, services, and processes in order to achieve higher performance levels and sustain competitive advantage (Hurley, Hult, & Knight, 2005). The concept of innovation is an important strategy that organizations use to create new things and new methods for developing a successful new system. Innovation is a process of transforming new ideas and new knowledge into new products and services. Innovation also helps an organization to solve problems related to costs and resources, to create values, and to sustain long-term prosperity (Cohn, 2013).

Innovation in the public sector has been one of the most relevant innovation issues in recent years. Innovation is a matter for the public sector to maintain high levels of welfare services to help address the economic and societal challenges that public sector face (Borins, 2001). It is particularly relevant in a context where budgetary constraints in many parts of the world reduce the public sector's size and increase efficiency and effectiveness. Moreover, the public sector has been challenged by the new public management concepts of reducing the cost of inputs, increasing productivity, and increasing the value of outputs for a better organization (Potts & Kastelle, 2010). Therefore, innovation is necessary to provide better and more efficient services to deal with challenges in the public sector. With the growing attention and awareness of public sector innovation, there is a potential for expanding the public sector’s role in applying innovation to various missions, such as policy

innovation, service innovation, administrative innovation, and systematic innovation (Koch & Hauknes, 2005) . In particular, service innovation in the public sector is significant because public service plays a vital role as demonstrators and setters of standards that need contributions to innovation in order to introduce new service products or improvements in existing service products (Carter Bloch & Bugge, 2013)

Innovation can be the solution for promoting more efficient public services and increasing the quality of performance at the same time. The innovation concept can be applied to public service in order to improve public service quality and to enhance government dealing with societal challenges (Damanpour, 2009). Public service innovation is linkage to public improvements, such as new public management (NPM) (Pollitt & Bouckaert, 2011) and new public service (NPS) (Denhardt & Denhardt, 2000), and the transformation from the government to the governance concept (Rhodes, 1996). Public services have often been considered among the low and inactive productivity growth activities and personal services and certain professional services (Maroto & Rubalcaba, 2008). However, public service performance shows variations among diverse public service activities, such as health, education, or public administration. A significant reason behind the low productivity in services is related to the lack of innovation and the difficulties of integrating technological innovation in services (Baumol, 2004), public services in particular. (Abrahamson, 1901)

In Thailand, globalization and the new management concept have pushed bureaucratic reform, which focuses on achieving the management process, is result-oriented, and increases government officers' potential. Public service improvement has also been employed as the public sector's primary mission to meet citizens' needs to live comfortably and safely. However, ten years after the bureaucratic reform, although the public sector is trying to improve public services, the rapidly changing economic and social conditions have become an obstacle to development. The citizens still do not receive fast and convenient services in all public services (Office of the Public Sector Development Commission, 2018). Further, not every government agency has been performing well in providing public services due to administration problems within the organization, such as rules and regulations. The concept of service development is still obsolete and lacks skills in developing service innovation.

The criticism from the citizens shows that the public service from government agencies do not comply with their needs for various reasons: the operation process is complicated and unclear; the citizens have to contact many agencies, where it is inconvenient to receive the service; services take a long time and commitment to service delivery is lacking; and there is difficult tracking status and lack of corruption risk protection (Khampee, 2018). Therefore, innovation is applied in Thai public service in order to enhance the public service's capacity to be more comfortable, faster, cheaper, and wiser. Furthermore, public service innovation must be associated with providing up-to-date services, upgraded technology, adopting the right strategies, and having quick and easy access (Valand, 2016).

Innovation in public service is one mechanism to push Thailand's 4.0 policy to unlock the country from several challenges. Moreover, General Prayut Chan-o-cha has declared public service development in national strategies on public rebalancing and development as part of Thailand’s 20-Year National Strategy (B.E.2561-2580) (Office of the National Economic and Social Development Council, 2019). This strategy shows that government agencies need to upgrade public service and facilitation in order to achieve excellent levels to meet service recipients' needs. Thus, Thailand has set goals for Thai public service innovation: upgrading innovation capabilities in the public sector and state enterprises; increasing opportunities for new product development; creating new value in public services; establishing new standards for providing public and social services; and promoting HR development to access innovation development both within and outside the organization (National Innovation Agency, 2017).

The Office of the Public Sector Development Commission (OPDC) has responsibility for supporting the public sector development and public sector duties that focus on the structure of bureaucracy, the personnel system, the government officer’s moral virtue, and ethical standards to be carried out under the aspiration of the National Government Organization Act (5^{th} Revision) A.D. 2002 and the royal decree A.D. 2003 on the principle and practice of good governance (Office of the Public Sector Development Commission, 2007). One of the missions in public sector development is to provide “Public Sector Excellence Awards” to government agencies that achieve the criteria for public administration success. This award is

given annually, and the award criteria are revised to reflect the changing contexts. The award has three categories: public service categories, public sector management categories, and participatory governance categories. This research focuses on a public service award, the service innovation award, given to government agencies that deliver valuable services to citizens by bringing innovation and new initiatives to develop better services and new products and to provide convenient service. The service innovation award was first introduced in 2006, which is considered a significant turning point in developing government services that focus on helping the citizens while organizing the system and managing public resources for maximum benefits (Office of the National Economic and Social Development Council, 2019). Many government agencies compete for this award every year. As a result, some public sectors have received public service innovation awards continuously. It is interesting how those government agencies successfully foster and develop innovation in the organization. In addition, learning from the best practice will inspire other government agencies to improve their service quality.

1.2 Statement of the Problem

There is a great deal of literature about the public sector and the drivers and policy strategies that are necessary to promote and implement innovations (for example, (Hartley, 2013; Bloch, 2013; Claver, 1998; Demircioglu, 2017). On the other hand, most service innovation research has focused on the private sector (Albury, 2005; Bloch, 2010; Gallouj & Weinstein, 1997; Hamel, 2004). Røste (2005) points out that in the institutional context, legal conditions, norms, and culture are essential incentives or restrictions on innovation in public service, which explains the limited applicability of business innovation models in the public sector (Røste, 2005). Even if it is known that innovation is thriving, an accessible environment that fosters creative thinking and action is necessary (Tidd & Bessant, 2018). Unfortunately, this is not always the case in the public sector, a context sharply defined by the existence of regulations that inhibit innovative actions.

The study about service innovation in the public sector has received attention recently, and most of the studies focus on conceptual and normative overviews

(Alves, 2013; Chen, Walker, & Sawhney, 2020; De Vries, Bekkers, & Tummers, 2016; Demircioglu & Audretsch, 2017; Vickers, Lyon, Sepulveda, & McMullin, 2017). The question can be raised about how much we currently know about public service innovation's underlying processes. The study of public service innovation is critical because innovation is not only generated internally. Therefore, the public sector needs to navigate through factors that affect innovation management's success by seeking inspiration by learning from best-practice organizations in innovation and from technological and innovation management (Albury, 2005). More extended analysis is still needed in order to understand public service innovation and its application better.

Unlike previous research in public services innovation, this research provides a comprehensive analysis of the determinants fostering public service innovation in the best practice organizations that have received the award from the OPDC. The quality of public service innovation does not happen overnight. It is vital to have the best practice of public service innovation in order to apply methods to improve service quality to respond to shifts in the environment and the citizens' requirements.

1.3 Objectives of the study

1) To study and examine the characteristics of awarded organizations in public service innovation.

2) To analyze the determinants affecting the fostering of innovation effectiveness in public service in the awarded organization.

3) To provide policy recommendations in the aspects of the determinants fostering public service innovation for enhancing Thai public service innovation performance.

1.4 Research Questions

1) What are the characteristics of awarded organizations in public service innovation?

2)What determinants significantly affect the fostering of innovation effectiveness in public service in the awarded organization?

3) What are the policy recommendations regarding the determinants fostering public service innovation for enhancing Thai public service innovation performance?

1.5 Expected Benefits of the Study

1) In the academic aspect, this research expects that the outcomes can be utilized as guidelines for the study of service innovation in other public sector, helping to broaden knowledge regarding innovation concepts in public service.

2) In terms of management benefits, this study's findings will provide valuable guidelines for leaders and even officers responsible for service innovation in government agencies. The study will help them to obtain and grasp the whole picture of service innovation in developing and improving service innovation to achieve OPDC standards.

1.6 Scope of the Study

The study focuses on the determinants fostering public service innovation effectiveness in the awarded organization. Because there are many awarded organizations, 36 departments in 10 ministries, and the time and resource constraints, the study of public service innovation cannot be analyzed in every organization. Thus, the scope of this study is as follows:

1) This study focuses on the departmental level in public sector that won an award

from the Public Sector Excellence Awards in the public service innovation category from the OPDC during 2003-2020.

2) In terms of content, this research aims to study the determinants fostering public service innovation in the awarded organization, namely, innovative leadership, organizational structure, human resource management, the organizational system, innovation strategy, organizational culture, and innovation management effectiveness.

3) This study is uses mixed-methods containing quantitative and qualitative

research. In the quantitative method study of the determinants fostering public service innovation effectiveness in the awarded organization, the target population was the officers at the department level in public sector that won an award in the Public Sector Excellence Awards. Regarding the qualitative study, it was carried out using structured, in-depth interviews. The key informants were: the head of the office, bureau, division, or section and working-level officers in the front office that directly contact people and officers that work in the back office as front office support.

1.7 Definition of Key Terms

1) Public Service Innovation is a new idea related to developing services innovation and equipment invention that result from technology or systematic steps to provide better services that are consistent with current situations and people's needs.

2) An Awarded Organization is the government agencies that have won the public sector excellence award in service innovation from the office of the public sector development commission.

3) Innovative Leadership is the leader that fosters innovation in organizations in terms of decision making, setting strategic directions, leading the innovation team, and facilitating the essential resources.

4) Organizational Structure is the organization's structure created to support the organization's functions, processes, and structure, and also provides directions for the organization.

5) Human Resource Management manages people in organizations in terms of competency, recruitment, selection, training and development, job design, performance appraisal, and reward system.

6) The Organizational System is the organization's processes that reveal the daily activities and how decisions are made to accomplish the overall goal.

7) Innovation Strategy is the plan and direction that an organization designs to develop the innovation capability to accomplish innovation goals.

8) Organizational Culture is the fundamental shared set of norms, values, and beliefs of employees, and the way of action and behaviors that are common elements for an organization.

9) Innovation Management Effectiveness is the success in managing innovation to meet the organization's goals.

1.8 Organization of the Study

The research is organized into five chapters as follows.

1) The first chapter introduces the significance of the study, provides a statement of the problem, the objectives, the research questions, the benefits of the study, its scope, and the definition of key terms.

2) Chapter two is the literature review which discusses the definition of institutional theory, contingency theory, the concept of innovation and public service innovation, the factors contributing to the public service innovation management effectiveness, and the conceptual framework and hypotheses.

3) Chapter three discusses the research methodology, including the research design, the unit of analysis, the population and sampling, the operational of variables and measurement, data collection, data analysis, and the measurement of reliability and validity.

4) Chapter four provides the data analysis and the results of the study.

5) Chapter five provides the conclusion, a discussion, and recommendations for further studies.

CHAPTER 2

LITERATURE REVIEW

2.1 Organization theory

2.1.1 Contingency theory

Contingency scholars propose that organizations need to adapt to the environment for survival due to an unstable and unpredictable environment. As a result, the situation will increase risks related to the organization's operations (Burns & Stalker, 1994; Fiedler, 1964; Lawrence & Lorsch, 1968). Contingency theory shows no one best way to organize collaboration or make decisions because the action is controlled by adapting to fit the context and situation (Waldman & Jensen, 2016). Moreover, the fit concept has positive implications for organizational performance (Donaldson, 2001). However, active organizations have the right “fit” with the environment and among its subsystems because the requirements of an organization are better satisfied when they are appropriately designed. The management style is appropriate for the uncertain environment and each workgroup's character in the organization (Fineman, Gabriel, & Sims, 2009). It can be said that organizations should achieve both external and internal fit in order to reach superior performance.

The significance of contingency theory is how to react to various situations or conditions by developing the most suitable management approach (Liang & Lu, 2013). Pfeffer (1981) stated that uncertainty is the key reason why organizations develop strategies across changes in both internal and external process relationships (Pfeffer, 1981). Organizational change research illustrates that environmental uncertainty can be a forecaster of the organization’ s structure because environmental difficulty rises; thus, the organization needs to change the structure to be decentralized and flexible in order to become successful organizations (Lawrence & Lorsch, 1967). The concept of contingency, used to describe innovation, is the organization's innovation process influenced by external and internal factors. The management level should consider contingency related to innovative capability when the organization is challenged by its environment. Most scholars have mentioned that

innovation capabilities rely on contingency theory. For example, Ottaviano (2004) indicated that an understanding of the environmental condition is necessary for organizational success because organizations are forced by dynamic and complex environments where innovation becomes essential (Ottaviano, 2004). The innovative organization requires flexible management and an organic structure in order to deal with uncertain environments (Benner & Tushman, 2003; Burns & Stalker, 1994; McKevitt & Wrigley, 1998). Francis (2000) suggested that several contingency factors may affect innovation capabilities, such as technology, strategy, innovation type, and organization size (Francis, 2000). Damanpour (1991) also found four contingency variables for developing innovation: the type of the organization, the type of innovation, the stage of adoption, and the scope of innovation (Damanpour, 1991). In summary, management practice with the contingency model should be compatible with the organization's mission, the internal and external environment, and other contingency variables.

2.1.2 Institutional theory

Nowadays, many organizations do not operate in a closed system because they must deal with many external influences, such as technological challenges, cultural diversity, and economic instability. That is the reason why many organizations have homogeneity of design practices and characteristics (DiMaggio & Powell, 1983; Zucker, 1987). Isomorphism is a term that explains homogenization, and it refers to a "constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions" (DiMaggio & Powell, 1983). They also pointed out that the environment forces organizations to be isomorphic because organizational characteristics are modified to increase compatibility with the environment. Thus, it seems to be expected that the bureaucracy makes them more similar in order to control their environment (DiMaggio & Powell, 1983; Oliver, 1991).

Institutional theory presents how organizations relate to the organizational environment and react to institutional processes (Oliver, 1991). This theory focuses on the pressures and constraints of the institutional environment. Scott (1987) defined the institution as regulatory structures, governmental agencies, laws, courts, and

professionals (Scott, 1987). Further, institutional theory aims to survive with the external environment. Therefore, it concerns accepting the environmental and, social system (DiMaggio & Powell, 1983). Hence, the organization mimics others in order to achieve “organization legitimacy” and survival (DiMaggio & Powell, 1983; Oliver, 1991). Avgerou (2001) states that the social context influences organizations in terms of organizational structures, organization goals, and organizational activities (Avgerou, 2001). Hence, under this theory, the primary concern is acceptance from the social system. DiMaggio and Powell (1983) have classified three social mechanisms of legitimacy. The first mechanism is coercive, which impacts the organization's formal and informal pressure by powerful entities such as the state and expectations of the cultural environment. The second mechanism is mimetic, which is the organization's aspiration to mimic effective organizations to survive in an unstable environment. The third mechanism is normative pressures, which is considered a factor is influencing norms and the sense of responsibility because normative pressures affect socially compliant behaviors and actions (Latif, Mahmood, Tze San, Mohd Said, & Bakhsh, 2020). These three mechanisms influence organizations to adapt to change by making them similar to others to ensure sustainability.

Institution theory describes innovation in normative beliefs that may force innovation management to adapt to change (Lorsuwannarat, 2013; Strang & Meyer, 1993). Institutional scholars focus on innovation in organizations and use three social mechanisms of legitimacy to describe the acquisition and distribution of innovation (Hargrave & Van de Ven, 2006; Hinings & Greenwood, 1988; Lounsbury & Crumley, 2007; Ruttan & Hayami, 1984).Organizations adopt and accept technical characteristics and imitate behavioral insight into the mechanism of innovation diffusion (Abrahamson, 1901; DiMaggio & Powell, 1983). Coercive pressure shows that organizations result from the pressure to adjust their behavior and compliance with standards in the organization’s environmental innovation. Meanwhile, organizations’ pressure can promote environmental innovation from organizations’ members (Liao, 2018). Mimetic pressure is the pressure from the surrounding organizations that are frequently change due to internal and external factors. Therefore, organizations should imitate the successful behavior of other members in their network in order to achieve “the best practice” (Liao, 2018; Liu, Ke, Wei, Gu, &

Chen, 2010). Normative pressure comes from each organization's behavior regulated by standards and norms from the external environment (Cavusoglu, Cavusoglu, Son, & Benbasat, 2015). Organizations must follow their survival setting rules, so organizations must manage environmental innovation under the constraints from external environmental institutions (Liao, 2018). Furthermore, the organization adopts new technology and practices that are often affected by its environmental innovation.

The institutional perspective of innovation shows that organizations need to innovate themselves in both behavior and processes in order to improve competitive advantage and survive in the external environment. Organizational survival occurs in compliance with standards, rules, and norms. Therefore, institution theory leads to a reactive organization that mimics innovation (Choua, Changb, Chengc, & Tsaib, 2003).

2.2 Management Effectiveness

2.2.1 Definition of innovation

It is believed that Schumpeter was the first scholar to define the concept of innovation (Sousa, Ferreira, Najberg, & Medeiros, 2015) . Schumpeter pointed out that innovation is new in terms of process, product, or organization, including new quality of goods, a new production technique, a new market, and a new source of supply of raw materials (Schumpeter, 1934). Jacobs and Snijders (2008) also described innovation as “something new being realized with added value” (Jacobs & Snijders, 2008). Bloch (2010) supported this view by defining innovation as “implementation of a substantial change in the way an organization manages of in products provided” (Bloch, 2010). Other scholars support this idea by conceptualizing innovation as implementing change to bring the new technique to an organization, solve problems, and respond to the environment (Damanpour & Wischnevsky, 2006; Ernst & Young, 2017). The OECD (2018) has also illustrated innovation as “the implementation of a new or significantly improved product or service, or process, or a new organizational method in an organization” (Organisation for Economic Co-operation and Development, 2018). Lawson and Samson (2002) argue that innovations do not implement something new in the organization only, but innovation

can also change knowledge continuously (Lawson & Samson, 2001). This knowledge, such as systems, new products, and processes, will support the competitive advantage. Yuan and Woodman (2010) support this view by defining innovation as "the results of a creative process relating different actors from one or more organizations, which leads to quality operation in the organization" (Yuan & Woodman, 2010). Some scholars have tried to differentiate between innovations that involve technologies, services, products, and the organization's management such as polices and organizational structure (Louise, 2002)

Table 2.1 Summary of the Definition of Innovation

Authors	Definition
Schumpeter (1982)	innovation refers to something new in terms of product service and processes that operate in the organization.
Van De Ven (2008)	innovation refers to the invention, development, and implementation of new ideas
OECD (2018) –The Oslo Manual	innovation is defined as a developed product process or a new organizational method in the organization's practices.
Lawson and Samson (2002)	innovation is defined as an organization's capability to transform knowledge into the system continuously, and products, services, and processes for the organization's advantage.
Earl (2002)	innovation is defined as organizational change and technological development.
Damanpour & Wischnevsky (2006)	innovation refers to the application of a change to bring innovation to the firms.
Jacobs and Snijders (2008)	innovation is something new with added value.
Yuan and Woodman (2010)	innovations are the consequences of a productive process concerning distinctive actor organizations that lead to the organization's quality operation.

In summary, according to the above definitions and discussions, innovation can be defined as creating new ideas to solve complex problems, implementing new results, services to increase organizational performance through enhancements in quality, efficiency productivity, and organizational competitiveness.

2.2.2 The key aspects of innovation management

Innovation management is a way to handle all of the activities needed to introduce something new, which means coming up with ideas, developing, prioritizing, and implementing them, and putting them into practice (Nieminen, 2018), for example, by launching new products or by introducing new internal processes. Innovation management is the systematic promotion of innovations in organizations and includes planning, organization, management, and control (Al-Ali, 2003). It also concerns the actual execution of innovation projects, such as the development of a new product. The management of such projects concerns making decisions, for example, members on the project team dealing with unexpected events and other challenges surrounding the project. Innovation management emerged as a discipline in the 1890s with Edison's innovation factory. Edison changed the image of the sole by converting innovation into a process with recognized steps practiced by a team of inventors working together-laying the foundations for the basic design of the R&D department (Limmanont, 2010). Innovation management thus corresponds to the development of new products, processes, and services. In cases where the organization does not make or offer products (goods or services), innovation improves how jobs are done to meet its mission. Scholars have specified innovation management aspects that include the following factors (Al-Ali, 2003; Hamel & Getz, 2004; Jesse, 2018; Rogers & Christiansen, 2001).

1) Vision and Strategy: the vision will determine the direction of organizational development and its role in the future. The organization that will develop into an innovative organization will need to focus on innovation at all levels of the organization. Strategy is the plan that the organization has for achieving long-term success. The key for success in innovation activities is that they be aligned with

organizational strategy. The organization needs to provide enough freedom to innovate and consider certain practical constraints, such as strategic focus, available resources, and capabilities. Partnerships can be a valuable strategy to promote innovation. Furthermore, the strategy should not be restricted to the same set of top-level decision-makers. Therefore, the strategy appears in the performance criteria for anyone below the level of senior executive.

2) The Competence Management System: the organization must have a competence management system that will be made aware of its capabilities within the organization to support current or future organizational goals or performances. The capability aspect revolves primarily around people; it refers to the organization's people's abilities, know-how, and practical skills. However, it also covers areas such as information capital and the tacit knowledge of the organization and other resources and available financial capital, all of which might be required to create innovation.

3) Goals: the goal of innovation must be communicated at all levels, and goals must be interrelated. Reasonable goals should be set based on comparisons with past performance and from the organization's vision.

4) Suitable structures can work as a force multiplier allowing the organization to operate and innovate much more effectively. The organization’s structure has various effects on organizational innovation capabilities, such as employee productivity, employee focus, and organizational communication. A teamwork project is more suitable for innovative work; thus, the organization should support forming the right team for the innovation project's purposes. Teams working on innovation need to move fast and adapt to their environment and make decisions independent of the organization's traditional ways of doing things.

5) Culture: the culture enables the organization to acquire people's capabilities. An appropriate innovation culture encourages the right kind of behavior and discourages the wrong kind. Culture can make a tremendous difference in an organization's innovativeness in terms of values, speed, learning, and experiments; and the organization can consider failure as just a normal part of creating anything new and providing enough freedom and responsibility for improving job performance.

Organizations capable of innovating need to be committed to innovation. The organization must have an organizational culture that empowers employees and

encourages them to submit their ideas. Management should adopt an appropriate innovation strategy to lead the innovation process. Furthermore, a suitable structure is important to consider in order to apply innovative projects.

2.2.3 Organizational innovation

Organizational innovation is an organization's ability to develop or improve services or products by renovating ideas and knowledge into new services and products in order to respond to environmental changes and to gain a competitive advantage. It has attracted several scholars attention (e.g., Dundon, 2002; Gary & Nancy, 2015; Lawson & Samson, 2002; Martins & Terblanche, 2003; Robin, 2002; Sherwood, 2001) to organizational innovation by categorizing the characteristics that favor innovative organizations as shown in table 2.2.

Table 2.2 Elements of Organizational Innovation

Scholars	Elements of organizational innovation
Sherwood (2001)	1) organizations set challenging visions and goals for the employee to achieve. 2) transform the organization structure from a “tall” organization to “flat” organization and create a flexible culture. 3) training and development the innovative skills for employees. 4) the organization generates an environment in knowledge sharing, innovation culture, and teamwork that fosters creativity and innovation. 5) the leader has a style, ideas, and behavior that promote innovation.
Lawson and Samson (2002)	1) vision and strategy focus on new ways to increase organizational awareness related to innovation strategy. 2) harnessing competence is the organizational capability to manage and allocate suitably for innovative products.

Scholars	Elements of organizational innovation
	3) organizational intelligence is the ability to process, access, and interpret information to increase the potential to respond and adapt to the environment. 4) creative and idea management by allowing all possible views to enhance success in implementing innovation exploitation.
Robin (2002)	1) shared values focus on each innovative organization's expression and build them into the organizational culture, and employees follow those values. 2) welcome the individual by recognizing a common understanding of values so that employees can bring them to that organization and combine elements of their individual lives in the professional setting. 3) inspire openness aiming to be designed for an open culture to support meetings and interaction in the organization. 4) successes are celebrated for employees, and organizations should have a regular schedule. 5) communication focuses on the story of each organization so that teaching or telling stories related to their shared histories is the most significant way to improve effective communication. 6) maintain customer focus to increase customer satisfaction by arranging meetings to know about problems and ideas to build innovative products or services. 7) focus on trends that aim to catch up with new trends in the organization. 8) cross-functional teams: creating a cross-functional teams can support innovative ideas for employees.

Scholars	Elements of organizational innovation
Dundon (2002)	1) welcome new concepts and new methods from employees. 2) inspire all employees to play an active role in innovation. 3) improve the rules for competitors. 4) give attention to future client's needs. 5) decentralize the information to clienteles in the purchasing process. 6) adopt new technology to create a competitive advantage. 7) use internal processes that support innovation. 8) allocation resources to support the application of new ideas. 9) reward system for innovative efforts. 10) adapt to change quickly.
Martins and Terblanche (2003)	1) the strategy is a strategy that fosters the improvement of new products. 2) the structure aims to stress the values that, impact the promotion or limitation of innovation and creativity in an organization. The flexibility, autonomy, teamwork, and flat organization will stimulate creativity. 3) support mechanism: the supporting system, including resources, technology, and reward and recognition support, is necessary for creativity and innovation. 4) behavior and encourages innovation focus on values and norms that the organization created to support innovation in the organization by handling mistakes generated new ideas, continuous learning culture, risk-taking, competitiveness, support for change, and conflict handling. 5) open-door communication policy is necessary to create innovation in the organization, including open communication between employees and the management

Scholars	Elements of organizational innovation
	level.
Gary and Nancy (2015)	1) Employees have been taught to think like innovators: innovation comes from an innovative mind. 2) A shared definition of innovation is that employees' act to understand the meaning of innovation and the organization's innovation process. 3) Comprehensive innovation by measuring innovative performance in eight ways: inputs, throughputs, outputs, leadership, competence, climate, efficiency, balance. 4) Responsible and proficient leaders in innovation are vital because they are critical in fostering innovation. 5) Innovation-friendly management processes are a way to re-engineer the management process that significantly impacts mindset, investment, and incentive.

According to table 2.2, most scholars categorize an innovative organization's characteristics as comprising six elements. First, the leader has an essential role in promoting innovation. The features of innovative leaders include flexibility, adaption to using innovative instruments, and avoiding pre-judgment when adopting new tools for the organization. Second, the organizational culture shows individuals' acts to share value, knowledge, and understanding of the innovation and innovation process. Third, strategy promotes the association among various groups, clarifies the organization’s purposes, and “pulls” in the same direction. Innovation comes from strategic plans, which are focused on solving customers’ problems and projects. Fourth, the organizational structure has an impact on creating an innovative environment. The organic structure is suitable for a creative innovation environment because it is very flexible, autonomous, and capable of adapting well to change. Fifth, the organizational system consists of a support mechanism from management, and an open communication system that allocates sufficient resources and technical support. Finally, human resource management has been called a “key ingredient to organizational success and failure,” including innovation performance in

organizations (N. J. Foss & Laursen, 2012). The human resource management factors that influence innovation consist of organizational training and development, reward and recognition, and performance measurements.

2.2.3.1 Innovation types

The studied literature on innovation revealed that differentiating kinds of innovation is vital for accepting innovative organizations because different organizations have distinctive features (Walker, 2006). Moreover, scholars classify several innovation typologies because of innovation typologies and innovation that shift from classical to complex structure system classifications (Kotsemir, Abroskin, & Meissner, 2013; Tellis, Prabhu, & Chandy, 2009). Scholars review the innovation typology documents (Bessant, 2015; Bloch, 2013;Tellis, 2009; Damanpour, 2009; Jørgensen, 2007;Kotsemir, 2013). The researches results show that innovation can be into six types.

First, product or service innovation relates to implementing new services/products or the development of current services/products that add benefits to the customer. Second, process innovation refers to adopting or improving new production processes (e.g., equipment, workflow mechanisms, and task specifications) in order to achieve a competitive advantage. Third, administrative and organizational innovation includes presenting new organizational values by upgrading new methods, structures, strategies, and administrative processes to improve service production. Fourth, marketing innovation is a way to manage new or different marketing techniques, including changes in pricing, product design, product placement, and market promotion in order to serve the demands of the target market. Fifth, policy innovation is a policy that affects innovation. It is a new item for leaders or policymakers to formulate new policy concepts and changes in policy. Sixth, conceptual innovation refers to improving new strategies and ideas to serve innovative organizations so that they can improve products, processes, services, and the organizational structure.

Table 2.3 Public Sector Innovation Types Applied

Innovation type	Focus	References
Product or service innovation	The implementation of the latest service or improvements in current service	Damanpour and Schneider (2009), Jørgensen and Bozeman (2007)
Process innovation	The improvement in internal and external processes	Bloch and Bugge (2013) Walker (2014)
Administrative and organizational innovation	Introducing new organizational values for improving the creation and delivery of services and products	Walker (2014) OECD (2018)
Marketing innovation	The implementation of a new practices of marketing, including products	Kotsemir et al. (2013) Walker (2014)
Marketing innovation	The implementation of a new practices of marketing, including product design, pricing, product placement, and market promotion	Kotsemir et al. (2013) Walker (2014) OECD (2018)
Policy innovation	The introduction of a new policy for leaders or policymakers to formulate new policy concepts and policy changes	Bessant, Bessant, & Tidd (2011) Bloch and Bugge (2013)
Conceptual innovation	The improvement of new strategies to serve the innovative organization	Steijn et al. (2011) Bloch and Bugge (2013)

2.2.3.2 Innovation process

The innovation process refers to developing and selecting innovation concepts (Jacobs & Snijders, 2008). Understanding the innovation process is the first step in dealing with innovation successfully. It is followed by empirical studies on effective organizations related the process with which leaders organize innovation (Andrew, Sirkin, Haanaes, & Michael, 2007 & Michael, 2007; Røste, 2005; Rothwell, 1994; Van de Ven & Poole, 1990). Furthermore, understanding the innovation

process's effect helps the organization to construct a best practice model (Bessant, 2015; Garud, Tuertscher, & Van de Ven, 2013). Organizations can apply this information in practice to support the management process, increase efficiency and quality, and decrease the chance of failure. There are five steps in the innovation process (Brian, 2017; Garud et al., 2013; Sherwood, 2001) as illustrated in figure 2.1.

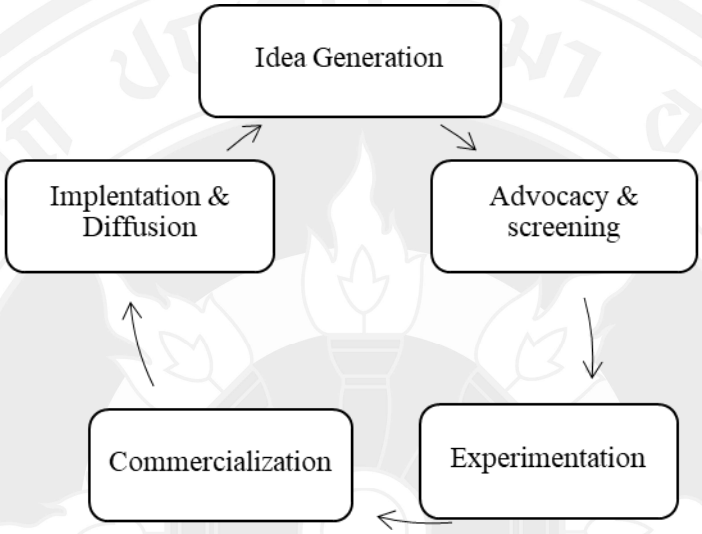

Figure 2.1 The Innovation Process
Source: Adapted from Brian, 2017; Garud et al., 2013; Sherwood, 2001.

1) Idea generation: idea generation is welcoming creative ideas from individuals who can share them. As Feldman and Pentland (2003) have stated, that “the emergence of novelty can ever be routinized” (Feldman & Pentland, 2003). Thus, management seems to have an essential role in supporting idea generation from employees. They have to pay attention to integrating ideas and material in terms of different knowledge and practice (Van de Ven & Grazman, 1999). Moreover, they should support a communication channel to motivate information flow in several ways, such as email, group discussion, and web-boards. Besides this, management has the responsibility to communicate the reason to the employee if the idea does not match the organization’s strategy or the organization lacks money to support it (Luecke, 2003)

2) Advocacy and screening: the process of discovering prospective advantages and trouble by evaluating the potential chance for ideas and screening for

other problems within the organization's specific context (Garud et al., 2013). Employees need to evaluate every idea that has been proposed because not all ideas are fit for development. However, the organization plays a leading role in building an influential culture in advocacy and screening by understanding the complications related to evaluating innovative ideas and supporting the right areas to receive feedback and advocacy.

3) Experimentation: experimentation is a repetitive process of development that will be re-evaluated by screening tests in order to test the feasibility of the chosen solution and the sustainability of ideas for the organization (Garud et al., 2013). Experimentation can bring about new ideas while gathering information from the results and the original idea's overall possibility, even though sometimes employees fail to find significant results. Failure means an excellent opportunity for the analysis of new and better ideas. At this stage, time is necessary because individuals that join the process must have sufficient time to run and reflect on the experiments (Brian, 2017). The result from experimentation is data, mock-ups, and possibility study for management to evaluate good innovation ideas for commercialization.

4) Commercialization: this stage of the innovation process switches the emphasis from development to convincing the audience. This step focuses on the potential of the ideas that impact the market. This step's crucial work is to convince the target audiences that the product is suitable for them. A significant part of the commercialization step is to explain how to use this innovation and to show the benefit of innovation when using this product by providing information that can engage the audience in relation to the idea (Brian, 2017).

5) Diffusion and implementation: diffusion and implementation are "two sides of the same coin" (Desouza et al., 2009). Diffusion is the primary system driving extensive implementation (Garud, 2013). Implementation is the process of setting up all of the elements (e.g., structure, resources) needed to exploit and develop the innovative ideas. This stage is essential because employees will receive feedback from clients to create and stimulate the future innovation process.

2.3 Public Service

The term public service is associated with the government and public sector that certain services should be available to all people. Spicker (2009) defined public service as government officials' mission to serve the public by providing products or services to individuals and communities (Spicker, 2009). Mckevitt (1999) recognized public services as the products or services are identical and apply to the public sector's mission (McKevitt & Wrigley, 1998). Public service is typically used for government activities in the public domain, e.g., public health, education, and social services. Public service is a service or activity created by the government to benefit or meet the public's needs. It is an activity that is controlled by the government that intends to meet the public's needs. It is a way to improve people's quality of life and to create the social development of the nation. Public services are generally monopolistic. Therefore, most services are essential services that the government organizes and provides for citizens to serve the public's interest and are mainly supplied for free. Public service is generally classified by the government's fundamental proposal-compulsory and voluntary services (Raksuwan, 2013). Compulsory services are assigned by-laws and prepared on a large scale. The government's laws aim to control public order and make citizens safe. Voluntary services are additional services offered to the citizens – they can decide whether or not to use these services.

Scholars have divided public service into seven categories (Raksuwan, 2013; Spicker, 2009; West & Wallace, 1991), as discussed below.

1) Service related to state sovereignty, which is the exclusive state responsibility and provided under the public laws. It empowers the public sector to implement. These services include identification cards, licenses, and permits.

2) Service related to security and social safety, including public accommodation, communication, and travel. Police or armed forces provide these services to prevent controversies in society or the country.

3) Service related to justice, including justice in terms of conflicts between citizens, private sector and citizens, the public sector and citizens, and the public and private sectors.

4) Service related to investment and the economy is interested in promoting and supporting its trade and expenditure. Moreover, it concerns achieving a competitive advantage in the economy that affects a country's financial health.

5) Service related to social affairs includes education, health, and social services. This service aims to improve the quality of life of the citizens.

6) Service related to infrastructure concerns public transportation, electricity, water supply, and post and telecommunications. Most of the infrastructure services are carried out by state enterprises.

7) Service related to government revenue includes all kinds of taxes, such as excise duties, customs duties, income tax, and value-added tax.

Public services are the end products of the government's services to its citizens and should be available to citizens as long as they are citizens. In addition, public services are services for the public at large, not specifically for a particular individual in the public domain. Some services are delivered for free, such as security and social safety services, but others can be commercial activities such as medical care, transportation, and water supply.

2.3.1 Public Service Innovation

Innovation in public service is increasingly realized as a primary factor in supporting public services for citizens. Service innovation is a natural way that the organization applies innovation experienced by people or partners for a particular benefit (Jørgensen & Bozeman, 2007). In government, service innovation is a new service experience or the finding of new solutions to deliver services to citizens quickly and easily so that they can access and understand them. Public service can innovate by providing new services for new users that can facilitate the mandate represented by the organization's mission and policy (Walker, 2006). Public service innovation (PSI) is defined as new ideas related to developing valuable ideas and innovation (Damanpour & Aravind, 2012; Piening, 2011). Miles (2011) stresses that PSI is the products, services, or service processes resulting from technology or systematic steps to provide better services (Miles, 2011). The output of service innovation is creating added value by using fewer resources by collaborating as a network. The ultimate goal is to create added value.

Innovation in public service is aimed at an essential activity designed to increase the services' ability to respond to the public's needs. Many scholars state that an organization discovers public service innovation through an experimental approach by determining the mechanisms to create public service innovation (Potts & Kastelle, 2010; Stoker, 2010). Matthijs et al. (2012) present why the government should promote service innovation (Mathis, Jackson, Valentine, & Meglich, 2017). First, market failure in public service can occur because of the market power that most of the controlled service sectors are concentrated on, such as energy, health, infrastructure, and telecommunications. Second, system failure in public service is limited in terms of knowledge, expertise, and the way in which innovation is accessed, resulting in the organization being unable to innovate. Moreover, citizens are not ready to pay for service innovation, and the government lacks a public service innovation model.

The classification of PSI has been developed through diverse disciplines, leading to different PSI dimensions. Borins (2011) proposed that public service innovation includes five characteristics: the system approach, information technology, process improvement, the involvement of the private or voluntary sector, and the empowerment of communities, citizens, or staff (Borins, 2001). In contrast, den Hertog et al. (2010) identified four critical dimensions of PSI: the service concept, the client interface, the service delivery system, and technological options (Den Hertog, Van der Aa, & De Jong, 2010). Service innovation can also be classified into three types— physical services, human services, and information services (Maglio et al., 2019). Physical services involve physical transformation by adopting new technologies such as RFID (radio-frequency identification transportation) in transportation. Human services are improvements in data management in public services, such as modified IT systems in medical services. Information services are significant characteristics of innovation in IT, such as online banking. Chen et al. (2020) proposed types of public service innovation (Chen et al., 2020)

1) Mission innovation begins by developing values internally by engaging in mission innovation. The mission innovation can lead to public service innovation in the mandated purpose politicians, and senior managers envision for an organization.

2) Policy innovation where organizations combine strategy into practice in policy innovation. Policy innovation shows new benefits to the citizens and other organizations that address social problems (De Vries et al., 2016).

3) Management innovation is developing or improving its capability by creating new management practices and technologies to achieve organizational goals. Two dimensions reflect the nature of management innovation. First, the technological dimension shows the new management of information systems to further the operating system effectively. Second, the administrative dimension applies new management systems and processes to provide services more effectively (Borins, 2014; Damanpour & Aravind, 2012).

4) Partner innovation is the initiation of new partnerships to improve the organization's ability to advance organizational goals by collaborating with other organizations that already have the competencies that the organizations need (Hartley, Sørensen, & Torfing, 2013).

5) Service innovation is the existing way in which the organization applies all other innovations. Service innovation promotes new services in order to achieve organizational goals and to represent its mission and policies (Walker, 2014).

6) Citizen innovation is a new program to help citizens by collaborating between citizen and public sector managers in order to promote public sector activities designed by government officers and managers to encourage citizen co-creation. This service changes the passive recipient's role to an active co-creator service (Simmons & Brennan, 2017).

Public service innovation consists of the crucial characteristic of dealing with stakeholders, formal and informal, and problem management between public organizations or public organizations and citizens. Improving services by developing, improving, changing, or designing the operational processes and public services to improve the public processes or services is faster, making them more friendly and easily accessible by using innovation or technology.

2.4 Thailand's Public Sector Excellence Awards

The Bureaucracy Reform in B.E. 2545 has resulted in significant administration process changes and the substantial restructuring of government sectors, ministries, ministerial bureaus, and departments. The National Government Organization Act (5th Revision) A.D. 2002 and Reorganization of Ministry, Sub-ministry, and Department Act, A.D. 2002. The panel code Section 3/1 of the National Government Organization Act (5th Revision) A.D.2002 specifies the public administration is required to effectively manage the people's well-being and accomplish public sector missions. The Office of the Public Sector Development Commission (OPDC) is the leading organization for public administration development. The OPDC is responsible for supporting the public sector development by providing recommendations and suggestions to the minister cabinet responsible for bureaucracy development and other public sector duties. It includes bureaucracy structure, the budgeting system, the personnel system, moral virtue, ethical standards, compensation, and other public sector practices to be carried out following the aspiration of the National Government Organization Act (5th Revision) A.D.2002 and royal decree A.D.2003 on the principles and practice of good governance.

The OPDC has pushed the public sector's reform through the implementation Thai Public Sector Development Strategic Plan B.E. 2546-2550 (A.D. 2003-2007) and B.E. 2551-2555 (A.D. 2008-2012) by requiring changes in processes and work methods in order to improve the capacity and standards of public sector so that they are equivalent to international standards. Thai public sector reform is based on The Royal Decree on Criteria and Procedures for Good Governance A.D.2003 to achieve essential government missions and to reduce unnecessary procedures. As a result, it is convenient for citizens to receive public services. Therefore, the OPDC established criteria for evaluating public sector by using guidelines that can be compared to international standards and that are recognized a criteria that can effectively assess the strengths and opportunities for improving work processes and organizational performance.

2.4.1 Public Sector Excellence Awards (PSEA)

PSEA are awarded to agencies committed to civil service success with three types of awards: public services, public sector management quality, and participatory Governance (Office of the Public Sector Development Commission, 2018). In terms of public service awards, they are given to government agencies that have improved public service with quality that is fast, convenient, transparent, fair, and satisfactory. In addition, the public service awards has five honorable mentions:

1) Service Standard: the award is based on implementing the service standard to expand public services. The award's goal is to recognize the agencies with the commitment to provide excellent public services with complete access to services.

2) Service Innovation: the award is based on government agencies' performance with service innovations or equipment inventions to serve the public. The public sector excellence awards' objective is to recognize a new service model consistent with the current situations and the people's needs.

3) Service Development: the award is based on the results of the public services with continuous improvement. The award's objective is to recognize the development of services with excellence to meet the people's needs to provide better services to the people.

4) Excellent Service: this award is based on the overall performance of the government agencies to integrate national policies to meet the awards' criteria

The evaluation criteria are classified into three groups:

1) Group 1, the requirements for evaluation service standards, service innovation, and service development

2) Group 2, the requirements for the assessment of excellent service

3) Group 3, the criteria for the evaluation of continuous development for service quality

The requirements for group 1 center on problem analysis, problem-solving, implementation, and the project's output and sustainability. The criteria for group 2 focuses on the system management of services, e.g., the proposal of the projects, the excellent processes, problems, good management, levels of outputs with high impacts leading to solutions, and successes in primary national strategy and policy and the sustainability of the project with Sustainable Development Goals (SDGs). The criteria

for group 3 consider the government agencies' performance, the results from the development of service quality, and concrete evidence of better public services. The Public Sector Excellence Awards reflect the public sectors' success in being committed to civil service success and having excellence among all public sectors. The PSEA transforms the public sector that may have become obsolete in the past to become a public administration under the policy of Thailand 4.0 that must be fast and able to apply innovations. Besides, it is also a support for the government to develop the government administration system, including central, provincial, and local governments following The Royal Decree on Criteria and Procedures for Good Governance A.D. 2003 (The Secretariat of the House of Representatives, 2017). The government agencies that received PSEA can enhance the government agencies' management and quality of services that benefit the citizens directly and indirectly. Moreover, it also helps create morale in action and motivates government agencies to be more committed to performing their duties. The PSEA also guarantees the success of public services, public sector management quality, and participatory governance that functions efficiently. The award will be a role model for other government agencies to be used as a guideline to improve their agencies' work systems.

2.5 Innovative Leadership

2.5.1 The role of leadership in innovation

Leadership is well considered in terms of the characteristics and competence in handling various organizational situations, especially regarding innovation management. The organization requires a leader to control and drive changes in the culture, structure, the organizational system, and leadership in order to transform an organization into the innovative one. The leader's role in enabling innovation in organizations regarding decision-making gives the direction, vision, and mission to create a competitive advantage. Leaders also play an essential role in encouraging new idea generation by providing individuals with the freedom to try new things and challenging work. Furthermore, the leader inspires intrinsic motivation, facilitates problem-solving, promotes a positive team climate, and creates and supports high-quality work relationships with team members (Avolio, Bass, & Jung, 1999; Tierney,

Farmer, & Graen, 1999). Moreover, leaders have to engage the whole innovation process by invite and encourage employees to participate in the creation and innovation process. A leader is also responsible for stimulating employees to produce creative knowledge and solutions. Organizations need innovative and effective leadership to manage the strategy's implementation and to encourage innovation (Agbor, 2008; Jabbar & Hussein, 2017). In this sense, “creativity is the seed of innovation that requires watering by leaders” (Lin & McDonough III, 2011). Therefore, one of the most critical roles of a leader to build innovation in the organization is developing a culture that promotes innovation. Most leaders realize that innovation is the primary driver of their organization’s ability to grow and survive in a competitive environment. However, innovation enabling is not created by chance. It results from organizational strategy, a supportive culture, and influential leaders who learn from failure (Horth & Vehar, 2012). Therefore, leaders of organizations need to establish a clear vision, mission, and strategic objectives. These should be well communicated throughout all levels in the organization to achieve in the innovation process (Soken & Barnes, 2014). Leaders should be skillful in driving innovation change inside the organization. However, there is no formula for innovation leadership connected with several leadership theories with different roles, activities, and behaviors (Lazarova, 2014). Sultana and Rahman (2012) suggests the character of a leader who can drive innovation in the organization that the leader should be innovative, and he also defined the term innovative leadership as follows: “Innovative leadership is a process of fostering innovation through developing innovation-friendly culture and setting the strategic direction that guides and builds trust among the employees to innovate” (Sultana & Rahman, 2012). Leadership in innovation leads by generating creative ideas and approaches for finding solutions, creating new products and services, and leading others by leading the innovation team and facilitating the essential resources. Generally, the top management level needs to recognize the individual environmental determinants that benefit innovation and that shape culture and strategy and communicate innovation goals. However, senior leaders that use hierarchy to control the work, decisions, information, and resource allocation will cause employees to be less creative and productive (Hornstein & De Guerre, 2006). Innovative leadership is not limited to the top management but should

present at all levels of the organization. The role of innovative leadership at other levels includes picking the right teams for innovative activities, using the right facilitators, and distributing ideas throughout the organization for future use. Functional leaders are responsible for developing an innovation strategy and for controlling the innovation process and new products. In contrast, middle managers act as a connector to support innovative teams and to facilitate cooperation between groups (Horth & Vehar, 2012). No organization can transform itself unless the leaders support the process and sustain it. Therefore, innovation in the organization depends on how leaders design the environment and allow creativity to develop. Moreover, it also depends on the encourage and to manage diversity to make organizations innovative.

2.5.2 Innovative Leadership and Organizational culture

The linkage between the leader and organizational culture shows that a leader is a crucial person that influences the organizational culture because every organization has its own culture. The culture of the organization creates values and norms as the fundamental principle in the organization. Different organizational cultures result from distinctive leader styles (Kavanagh & Ashkanasy, 2006; Schein, 2010). Further, a leader has a role in managing culture to develop and sustain organizational capacity because its success is the primary responsibility of the management level. In many circumstances, leadership characteristics are required to change the culture to commit to achieving results. An innovative organization needs a leader that is capable of developing an innovative culture, and leaders develop an innovation culture by encouraging employees initiate and share new ideas and accept different opinions. Furthermore, leaders can build an influential organizational culture by influencing innovative behavior and contributing to the innovative organization (Elenkov & Manev, 2005). Leaders that delegate also foster innovation by creating a sharing culture that facilitates interaction and information among individuals (Damanpour, 1991) This interaction and information sharing are essential because they show how effective knowledge transfer and opinions are. The dimensions of the innovative culture framework have been proposed by Maher (2014), where it is shown that the leader has a vital role in a strong innovative culture, and the leader will take part in

every step in supporting it (Maher, 2014). First, is the creating of, a risk-taking culture to discover new things, but taking risks can lead to failure, so the leader can learn from failure rather than punishing. Moreover, leaders should accept mistakes that are part of success in the innovation process because mistake tolerance is one of the aspects of a culture that demonstrates leadership qualities.

When the employee finds an error in the working process, the leader should give him or her suggestions and feedback and make him/her feel confident. Second, the innovation process should be supported by allocating necessary resources such as time, authority, and financial resources. When employees know that there is sufficient support while developing innovative ideas, they will be motivated and encouraged to work. Third, knowledge transfer should be supported from inside and outside the organization because knowledge is the primary source of innovation. Knowledge must be widely, efficiently, and quickly accessed communicated. Fourth, the leader must have a clear goal for the innovation: innovation is highly beneficial by setting specific innovative objectives, ambitious goals, and initiating motivated teams to find ways to implement the innovation process. Fifth, employees should be motivated by giving rewards and recognition when performance is aligned with the organizational goal. Rewards and recognition will reinforce the innovation behavior of the employee, which will benefit the organization's development of innovation. Sixth, leaders must consider encouraging skills development, especially in implementing ideas and cultivating creative thinking by using practical tools such as facilitating flexibility and training to achieve high innovation performance. Finally, the dimension of relationships refers to the organization's interaction to share innovative ideas and to foster collaborative teamwork. Therefore, the leader has a vital role in building a collaborative environment, respecting diversity, respecting different viewpoints, and thinking by honoring everyone to create a capable work team. This role is an excellent basis for growing a culture of creativity and innovation.

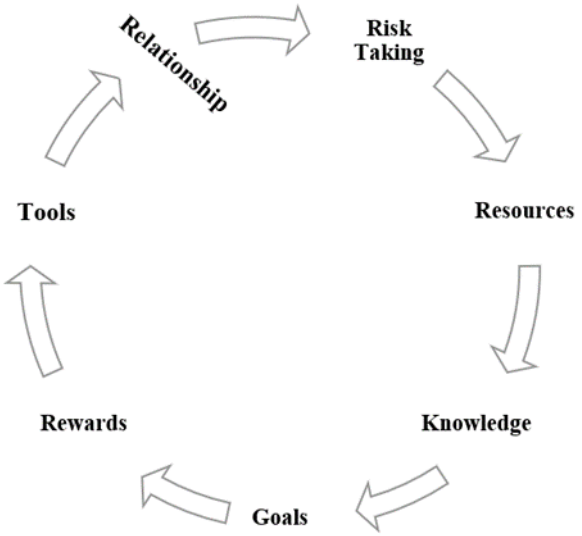

Figure 2.2 Dimensions of an Innovative Culture
Source: Maher (2014)

From all of the ideas mentioned above concerning the role of leadership and organizational culture, it shows that the organizational culture is the responsibility of leaders and that is evolves. The most innovative organization is led by innovative leadership, managing all changes and being a change agent. Leaders have an essential role in creating an innovative climate, dealing with diversity and conflict, supporting team-building activities, developing knowledge skills, facilitating knowledge sharing, taking risks and having tolerance of risks, allocating significant resources, and supporting creative thinking. Leaders are, therefore, fundamental in approaching an organization's innovation culture.

2.5.2 Innovative leadership and innovation strategy

Leadership also helps align the organization's strategic visions, goals, and execution towards innovation (Denti & Hemlin, 2012). Several scholars identify leadership behaviors as the most influential factor to drive innovation (Camelo-Ordaz, Fernández-Alles, & Valle-Cabrera, 2008; Katz, Preez, & Schutte, 2010; Lawton, 2001; Soken & Barnes, 2014). Camelo-Ordaz et al. (2008) found a positive relationship between the leader's strategic vision and how employees affect

innovative performance (Camelo-Ordaz, Fernández-Alles, & Valle-Cabrera, 2008). Moreover, Wu et al. (2011) found that innovation strategy cannot be applied without innovative leadership and culture (Wu & Lin, 2011). Therefore, leadership is one of the essential factors for integrating innovation strategy into organizational strategy. According to Su et al. (2003), leaders that support the direction of innovative by formulating a suitable innovation strategy have a significant effect on the organization's performance (Su, Li, & Su, 2003). Strong innovation leadership can achieve innovation capabilities by aligning innovation strategy with organizational strategy (Katz, Du Preez, & Schutte, 2010). According to Soken and Barnes (2014), leaders' innovative practice behavior correlates with innovative performance (Soken & Barnes, 2014). Additionally, Bel (2010) pointed out that behaviors such as being skillful, having effective communication regarding strategies, being a motivator, and support can promote innovation (Bel, 2010). However, different leadership levels require the development of different behaviors according to the level of the position; leaders need more advice, inspiration, and formulation strategies. In particular, strategic skills will help a high-level leader have a clear vision and mission to formulate short- and long-term organizational strategies. Innovation capability is not created by chance, and it results in organizational strategies and effective leadership. Most leaders perceive that innovation is the critical factor in adapting to a fast-changing environment in order to have a competitive advantage. Leaders in innovative organizations have some behaviors and skills for integrating the appropriate strategies in their environment.

2.6 Innovation Strategy

A strategy is the direction of decisions or plans to achieve visions and missions (Mintzberg, 2000). According to Pisano (2015), a strategy is the commitment to a set of reasonable plans, policies, or behaviors to accomplish a particular competitive goal (Pisano, 2015). The strategy is a crucial contributing factor in driving a competitive advantage (Elenkov & Manev, 2005). Organizations adapt their strategy to respond to the environment in order to survive and grow. The strategy is to link goals, plans,

policies and decisions, actions, and resource allocation. It requires organizations to make decisions about which work and functions should be carried out.

The linkage between innovation and strategy is essential for effective innovation management. A strategy determines the shape of resources, products, processes, and systems to foster a successful innovation. Without a strategy for innovation, innovation performance and innovative achievement are impossible (Lawson & Samson, 2001). Lendel and Varmus (2011) describe innovation strategy as follows: innovation strategy is the innovative direction of an organization's perspective on the option of objectives, techniques, and procedures to develop innovative capability (Lendel & Varmus, 2011). Katz et al. defined innovation strategy as a plan that will help the organization accomplish innovative goals (Katz et al., 2010). In addition, innovation strategy is how the organization uses innovation to accomplish organizational strategy and improves organizational performance (Lendel & Varmus, 2011). Organizations use innovation strategy to determine the specific type of innovation that best matches organizations' goals (Dodgson, Gann, & Salter, 2008). It is necessary to create innovative strategy that align with the overall organization's strategies in order to achieve it goals and objectives.

The roles of an innovation strategy are closely linked to the roles of innovative in the organization. Innovation plays two significant roles in the success of an innovative organization (Silverstein, Samuel, & DeCarlo, 2013). First, innovation strategy plays a role in achieving an organization's current objectives by enabling it to launch innovative products, find innovative ways to enter new markets, or improve internal efficiencies. Secondly, innovation can change the organization's direction when required. Thus, it is a mechanism for changing an organization's directions and objectives. Furthermore, the organization can use an innovation strategy for continuous improvement and innovation to do things better and doing things differently. Furthermore, organizations may improve their performance from the contingency perspective by applying effective strategies (Donaldson, 2001). Applying innovation strategies in an organization can ensure successful innovations by decreasing critical internal and external contingencies (Lyytinen & Damsgaard, 2001). For instance, in an increasingly competitive environment and with constantly

changing customer needs, managers will strategize and allocate resources appropriately in order to improve the firm's innovation performance.

It must be emphasized that the most critical perspective on strategy in most of the literature is the study of the relationship between strategy and organizational performance (Igartua, Garrigós, & Hervas-Oliver, 2010 2010; Keupp, Beckenbauer, & Gassmann, 2010 2010; Shisia, Sang, Matoke, & Omwario, 2014 & Omwario, 2014; Teddy, 2012). Hornsby et al. (2002) found that for an innovation strategy to serve its purpose of improving the level of innovation in an organization, it should include the vision, organizational design, management systems, and the compensation system (Hornsby, Kuratko, & Zahra, 2002). According to Wu and Lin (2012), innovation strategy positively impacts innovation performance and influences innovation quality (Wu & Lin, 2011). Zhou (2006) found that an innovation strategy suitable for an uncertain environment, rapid technological change, and a highly competitive environment because it increases organizational performance (Zhou, 2006). Innovation strategy is needed for the organization because if the organization lacks an innovation strategy, it will lack a clear direction in innovation improvement. It is crucial to select an appropriate innovation model that successfully supports the innovation process and that can be used to implement innovation strategy.

Innovation has a slight chance of success without integrating it with a strategy. Innovation strategies help organizations to have directions to develop their innovation potential. Furthermore, innovation strategy helps the organization guide resource-allocation decisions to meet innovation objectives and to create a competitive advantage (Dodgson et al., 2008). It confirms that the adoption of strategies is crucial in managing innovation and in making innovation happen.

2.7 Organizational Culture

Ouchi and Wikins (1985) illustrate that organizational culture symbolizes an employee's understanding of organizational values (Ouchi & Wilkins, 1985). Schein and Schein (2016) state that a given group develops culture to solve the problem to adjust to the environment (Schein, 2010). Scholars have also found that employees' norms, values, actions, and behaviors are common elements for in every organization.

Therefore, employees must understand culture as a fundamental principle for all organizations. Organizations that need to be innovative have to change their organizational culture and create a creative character. Loewe and Dominiquini (2006) mentioned that a culture grounded on rigid control is not beneficial to innovation or creativity because it blocks employees' creativity, productivity, and leads to slow decision-making (Loewe & Dominiquini, 2006). They also found that organizational cultures and values significantly influence innovation effectiveness. Organizational cultures and values focus on being an open culture and incentives that challenge the status quo, fostering the participation of teamwork in the innovation process, and controlling the behavior of an employee in order to encourage activity and initiative employees (Loewe & Dominiquini, 2006), as seen in figure 2.3.

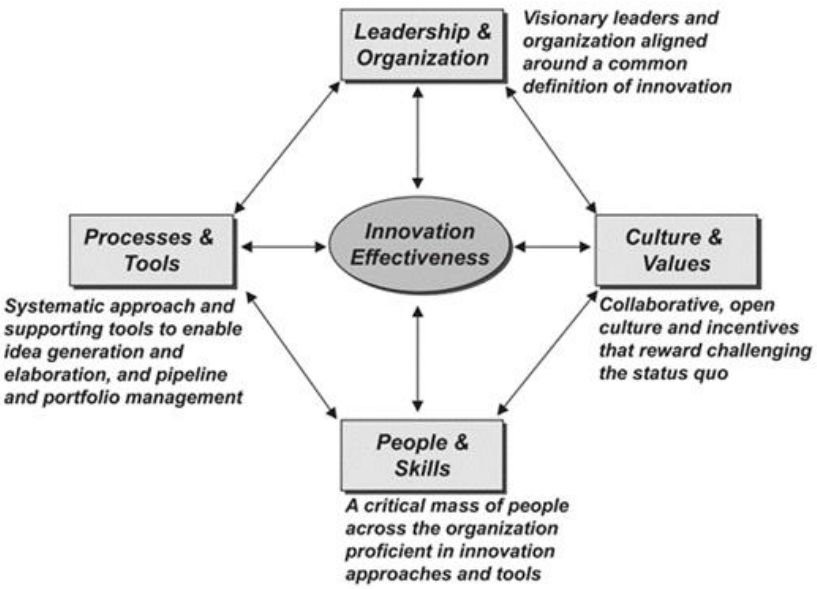

Figure 2.3 Key Areas of Systematic Innovation Capability
Source: Loewe, Dominiquini (2006)

An organization with an innovative culture can influence employees' actual behavior regarding values, norms, and beliefs. Further, an innovation culture can be determined as a multi-dimensional context that involves the intention to be innovative, the infrastructure to maintain innovation, and the operational-level behaviors necessary to influence the environment to implement innovation (Dobni, 2008). The active organization can absorb innovation into the organization's

organizational culture and management processes (Glisson, 2015). Kaasa and Vadi (2008) stated that culture affects innovation because it shapes the models dealing with the novelty, individual initiatives, collective actions, understandings, and behaviors regarding risks and opportunities (Kaasa & Vadi, 2008). Supporting and encouraging employees are essential to promoting innovation in an organization. Moreover, Claver et al. (1998) pointed out that be an innovative culture requires a leader that can take opportunities and risks, encourage creativity, and create an innovation-oriented culture, allowing employees to develop their interests and employ their unique talents (Claver, Llopis, Garcia, & Molina, 1998). Furthermore, the leader can develop the organization's mission, which the employees will identify with, providing employees with a sense that their work is meaningful and positively impacts the achievement of objectives (Hazem & Zehou, 2019). Creating an environment is also necessary for innovative organizations because a healthier environment reflects more significant outcomes. The environment that is appropriate for creating an innovative organization is one that has transparent rewards and incentive systems, allowing active involvement in the innovation process and accepting the mistakes and risks related to the innovation process.

2.7.1 Organizational Culture and Organizational Structure

Martins and Terblanche (2003) created a framework that illustrates organizational culture, showing that organizational culture influences structure (Martins & Terblanche, 2003). An organizational culture impacts organizational structure through its design and implementation. Further, an organizational culture realizes its impact on the organizational design by forming the top management's interpretative schemes, selecting the organizational structure model (Ostroff, Kinicki, & Muhammad, 2013). The culture creates a frame of reference in which the organization management's considerations and reasoning circulate in decision-making concerning the organizational structure model, which must follow dominant cultural assumptions, values, and norms (Janićijević, 2013). A culture that supports innovation is processes values such as freedom, work teams, and flexibility. It will promote innovation, whereas specialization, control, formalization, rigidity, standardization, and centralization will inhibit innovation (Damanpour & Schneider,

2009 1997; Martins & Terblanche, 2003). Every organizational structure affects the behavior of employees in their everyday work. It influences the employees' methods of conducting tasks, their interactions with others, and their decisions (Janićijević, 2013). Martins and Terblanche (2003) also pointed out that employees should be rewarded for risk-taking and develop new ideas to reinforce the desired behavior (Martins & Terblanche, 2003). Organizational culture also supports the strategic vision mission and purposefulness. An innovative organization's vision and mission are customer-oriented (Adams, Bessant, & Phelps, 2006). The values associate with visions will lead to practical organizational commitment. Moreover, visions can connect employees during change and demonstrate the potential of innovation. Shared values are a crucial aspect of culture that affects innovation strategy because they connect organizational employees through common goals in the future and motivate the whole organization with the hope of being successful (Taly, Naama, & Boas, 2004). Purposefulness refers to the goals and objectives which influence innovation. Organizational goals and objectives present the values of an organization that promotes innovation. When a leader sets precise goals for innovation, it will lead employees to focus on the right priorities and increase innovation activity.

2.8 Human Resource Management

Human resource management can be defined broadly in terms of all management activities impacting the relationships between the organization and its employees (Mathis et al., 2017) or more concretely as a system of operational functions such as staffing, selection, job design, training, career development, performance appraisal, and compensation (e.g., Pfeffer, 1998). An empirical study supports the contention that HRM influences mechanisms such as development and exploitation of intellectual capital (Wright, Dunford, & Snell, 2001), knowledge creation, and new product development (Collins & Smith, 2006), and organizational learning, in turn, facilitates innovation. Some scholars have studied the relationship between HRM and innovation (Chen & Huang, 2009; De Leede & Looise, 2005; Laursen & Foss, 2003; Y. Li, Zhao, & Liu, 2006; Robin, 2002; Tan & Nasurdin, 2011). The results showed that HRM practices influence innovation capacity directly.

Roberts (2007) presented, for example, four dimensions of staffing, structure, strategy, and system support that were central to successful innovation and ensured that the organization had the right kind of effective management as acritical staffing issue (Roberts, 2007). Furthermore, De Leede and Looise found that the role of HRM can align with innovation. When an organization has an appropriate organizational structure, it supports innovative organizational staffing, promotes individual development and teamwork, opens extensive communication and participation, and builds a creative culture (De Leede & Looise, 2005). On the other hand, some scholars have studied the relationship between HR practices and organizational outcomes regarding innovation achievement (Chen & Huang, 2009; Foss, & Laursen, K, 2020; Laursen & Foss, 2003; Tan & Nasurdin, 2011). It can be seen that HRM practices play an essential role in activating organizational innovation by increasing employee creativity (Chen & Huang, 2009; Yang & Lin, 2009).

Human resource management practice

Human resource management practice includes recruitment, selection, and employee retention with behaviors that can foster innovation (V. V. Anand et al., 2018; Jennie, 2013; Jiang, Wang, & Zhao, 2012 2012).

Recruitment and Selection

Recruitment and selection aim to find appropriate performance, attitudes, and skills to join the organization that will enable the organization to combine these characteristics to stimulate innovation (Jennie, 2013). Since employee creativity is a form of human capital, staffing can be considered a critical approach to improving employee creativity (Jimenez-Jimenez & Sanz-Valle, 2008). Subramaniam and Youndt (2005) demonstrate that organizational innovation depends on its knowledge base, which recruits talented people to the organization (Subramaniam & Youndt, 2005). Furthermore, Jing, Wang, and Zhao (2012) proposed that recruitment and selection positively affect management and technology innovation (Jiang et al., 2012). Previous studies have shown that the recruitment and selection process impacts organizational performance in terms of innovation (V. V. Anand et al., 2018). The careful recruitment and selection of talented people may play a key role in creating the conditions needed for innovation. As a result, it is not surprising that successful

organizations establish recruiting networks to systematically seek new talent to build a pool of creative employees for the organization (Jiang et al., 2012). Organizations can focus on screening before selecting employees regarding their task expertise, intrinsic motivation, and cognitive skills necessary for creativity. A comprehensive selection and hiring procedure using more recruiting sources, rigorous interviews, and screening tests will increase the amount of information gathered about each applicant before making a hiring decision (Olian & Rynes, 1984). Thus, it was found that in every organization, recruitment and selection play a vital role in supporting innovation when management level and HR can find the right employee that has the skills or attitude to match the organization's vision.

Job Design

Different studies have found that job design impacts innovative work behavior (De Spiegelaere, Van Gyes, & Hootegem, 2012 2018; Jiang et al., 2012; Masrek, Noordin, Yusof, & Shuhidan, 2017 & Shuhidan, 2017; Weilinghoff, 2016). Job design that focuses on empowerment and increases freedom influences the drive to be creative and impacts innovation (Jiang et al., 2012). Four job design practices, namely job complexity, job rotation, reflection time, and employee interaction, have been found to have a relationship with creativity-driven innovation (Weilinghoff, 2016). Job complexity refers to job responsibility tasks that are complex and difficult to accomplish (Morgeson & Humphrey, 2006). The complex functions require high-level skills to promote creativity because complex tasks will motivate employees' attention. Employees will be more influenced to be creative to reach high performance (Masrek et al., 2017) Further research also found that job rotation is related to innovation capability (Holman et al., 2012; Jiang et al., 2012; Martins & Terblanche, 2003). Job rotation is a method by which employees can change the unit or department to expand their work experience. Previous research found that job rotation positively impacts organizational innovation (Ho, Chang, Shih, & Liang, 2009 & Liang, 2009; Jiang et al., 2012; Weilinghoff, 2016), and it increases flexibility in job responsibility and fosters creativity (Martins & Terblanche, 2003). However, the leader should consider the schedule of the job rotation based on the right time because frequent changes can lead to an adverse effect on the employee (Ho et al.,

2009). Reflection time is critical for job design because when an HR design challenges a job, it will increase professional jobs' motivation and stress (Amabile, 2002; Elsbach & Hargadon, 2006). Having a tight schedule in routine work can cause brainpower loss in terms of thinking about and designing other creative jobs (Weilinghoff, 2016). On the other hand, free time in a schedule can reduce work pressure and promote reflective thinking and energy, leading to the development of creativity (Gelter, 2003). Moreover, when employees have regular free time, they can develop creative and innovative ideas (Elsbach & Hargadon, 2006).

Finally, employee interaction includes direct and indirect interactions in routine work and free time (Weilinghoff, 2016). Employee interaction is an essential factor supporting job design because communicating and exchanging information with co-workers are necessary to achieve the assignments and to arrive at creative ideas (Mumford, Scott, Gaddis, & Strange, 2002). Liu (2013) also pointed out that exchanging ideas between employees and their companions can support innovative organizations (Liu, 2013). Many scholars have studied the relationship between employee interaction and the creativity of employees. The results showed a positive relationship between these variables when employees exchange information, share ideas, learn from each other, and improve the individual's creativity (Lebuda, Galewska-Kustra, & Glaveanu, 2016 2017; Liu, 2013; Parjanen, 2012). An open-door policy is an approach that supports employee interaction for the exchange of ideas, discussions, and comments, which can generate innovative ideas (Martins & Terblanche, 2003).

In conclusion, the job design, which includes autonomy, job challenges, job rotation, flexible time for a professional job, and the regular support of interaction, can enable the employee to achieve creative and innovative competence.

Training and Development

Training also positively affects employees' creativity and innovation for the support of organizations (Li et al., 2006). Moreover, other researchers have found that training designed to increase creativity positively impacts idea generation (Scott, Leritz, & Mumford, 2004). Beugelsdijk (2008) also found that training is significant in terms of generating incremental innovations (Beugelsdijk, 2008). Training

increases employees' knowledge and skills so that they can have new ideas and apply them in their professional job. Moreover, continuous training guarantees access to knowledge, which increases employees' skills in innovation because talent is necessary for innovation (Bauernschuster, Falck, & Heblich, 2009 2010). Training and development benefit from creating innovative organizations. When training employees about innovative concepts and resources, organizations empower them to learn new ways of thinking and utilize new skills. Additionally, training in innovation encourages the employee to feel more engaged with the organization and leader because he or she will feel that he/she is essential enough to contribute his/her ideas to foster innovation (Anthony, 2014). Leaders can be associated with both training and innovation achievement. Previous studies have shown that investment in workplace training positively impacts innovation performance (Mariz-Pérez, Teijeiro-Álvarez, & García-Álvarez, 2012 2012). Dostie (2018) also found that both leader support in the classroom and on-the-job training positively affect the promotion of innovation (Dostie, 2018). Training and development play an essential role in improving competitive advantage and creating knowledge because of innovation's rapid change. Thus, employees need to upgrade their skills in order to adapt to changes in demand for continuous innovation development.

Performance Appraisal

Performance appraisal is the process that organizations use to measure and evaluate the employee's performance every year (Sharma & Sharma, 2018). Performance appraisal aims to analyze the performance of employees, identify developments need, and align the HRM measurements with the organization’s mission and strategies (Jończyk34 & Buchelt35, 2015). Performance appraisal is a strategic instrument that can improve organizational performance because it will highlight the individuals' advantages and disadvantages. Thus, employees can use this result to develop and carry out their responsibility better. In an organization with innovative goals in its individuals' development plans, the leader can give feedback and discuss needs for further development related to innovation (Jennie, 2013). Performance appraisal is essential for the organization to be innovative because it, directly and indirectly, affects the organization (Tan & Nasurdin, 2011). Previous

studies have found a positive relationship between performance appraisal and employee innovation performance. For example, Boswell and Boudreau (2000) proposed that performance appraisal encourages employees in terms of efforts, satisfaction, and aspiration relevant to innovative behavior (Boswell & Boudreau, 2000). Further, Tan and Nasurdin (2015) also found the impact of performance appraisals on knowledge management innovations as a mediator (Tan & Nasurdin, 2011). Different kinds of assessments were studied by Jiang et al. (2012). They found that when performance appraisal is relevant to the level of payment, it will affect the intrinsic motivation of employee innovation behavior (Jiang et al., 2012). The use of appraisal and feedback based on accompanying rewards will successfully promote creative work (Mumford, 2002). Jiménez-Jiménez and Sanz-Valle (2008) also pointed out that performance-based pay should be linked to performance appraisal, and a reward system should motivate knowledge creation and innovative behavior (Jimenez-Jimenez & Sanz-Valle, 2008). In conclusion, performance appraisal is an essential tool to increase the organization's effectiveness through driving employee performance. Moreover, performance appraisal is a crucial mechanism that supports the organization to highlight employee behavior and skills, fostering innovative performance.

Rewards and Recognition

Reward systems motivate employees to increase their participation and generate ideas for fostering innovation. The reward system provides financial and recognition to support employees when developing or producing successful products or ideas (Sharma & Sharma, 2018). Scholars have found a positive relationship between rewards and employee behavior when the organization presents a suitable reward condition (Reilly & Sheehan, 2017). An organization needs an approach to rewards and recognition of employees in order to drive innovation in products and services (Leavitt, 2009). Jiang et al. (2012) found that rewards were affected by the ability of and the inspiration for innovative employees (Jiang et al., 2012). Further, Jennie (2013) illustrated that the reward system is associated with creativity and innovation development initiatives (Jennie, 2013). Organizations drive innovation through rewards will link innovation as the goal and core values (Leavitt, 2009).

However, Lau and Ngo (2004) mentioned that organizations should be concerned about the difference between individual pay that may have a negative effect on the willingness of employees to participate in innovative projects (Lau & Ngo, 2004). Thus, scholars have suggested that team innovation and rewards should be based on a group-based system (Beugelsdijk, 2008; Lau & Ngo, 2004). Sharma and Sharma (2018) supported this view; they showed that group-based systems tend to be more positive in motivating them to participate in organizational improvements and innovation than individual-based systems (Sharma & Sharma, 2018). A reward system is essential to managing successful organizational innovation because rewards stimulate employees to pursue innovative and productive ideas. Reward practice should concern both intrinsic and extrinsic motivation. Furthermore, a reward system reflects the organization's engagement in innovation because it can motivate and reinforce employee behavior.

In conclusion, HRM practice is the process of participating in different activities that are connected to innovative processes. HRM practices benefit innovation development by attracting and selecting the right employees, training them to develop innovative ideas, applying performance appraisals to motivate innovative behavior, providing rewards and recognition to successful contributors, and designing jobs suitable for promoting innovation. It shows that HRM practices are a critical factor that drives innovation in the organization if leaders support and employees cooperate in HR activities.

2.9 Organizational Structure

2.9.1 Concept of Organizational Structure

Organizational structure is defined as work divided into separate tasks that can coordinate individuals and work with teams to meet the organization's goals and objectives (Mintzberg, 1983; Stacey, 2011). Furthermore, the organization's structure is created to make the functions and processes of the organization flow fluently, and structure also provides direction for the organization. Organizational structure is considered an internal factor that noticeably impacts its ability to innovate and to create a competitive advantage. The structure also shows individual design strategy

duties and encourages activity and implementation (Hunt, Lambe, & Wittmann, 2002 2003; Spanos, Zaralis, & Lioukas, 2004 2004).

According to the literature, there are three core components of the organizational structure (Andrews & Kacmar, 2001; Bodewes, 2002; Marín-Idárraga & Cuartas, 2016; Mintzberg, 1983; Pugh, Hickson, Hinings, & Turner, 2006). These dimensions will impact innovation performance with different results (Dekoulou & Trivellas, 2017; Lee, Min, & Lee, 2016; Marín-Idárraga & Cuartas, 2016). First, formalization refers to the extent to which rules, procedures, instructions are written (Pugh, Hickson, Hinings, & Turner, 1968). Formalization illustrates coordination between organization control and the work process and behavior through official documentation (M. C. Andrews & Kacmar, 2001). The formalized organization has a policy and procedure manual, assesses the number and specificity of its regulations, and reviews job descriptions to determine the extent of work (Bodewes, 2002). Organizations get benefits from formalization by regulating employee's behavior. Second, centralization refers to the area in which decision-making is concentrated at a single point in the organization by asking, "Who is the last person whose approval must be obtained before legitimate action is taken even if others have subsequently to confirm the decision?" (Pugh et al., 1968). It shows the level in the hierarchy where administrative work can be authorized. A high concentration indicates high centralization, whereas a low concentration indicates low centralization, called decentralization. Decentralization refers to the delegated authority from top to bottom in planning, implementation, management, and resource allocation (Darvishmotevali, 2019; Kralewski, 2012; Mosley, Mosley, & Pietri, 2010). Third, specialization refers to the organization's tasks being divided into separate jobs where each step is completed by different persons (Lloria, 2007). When an organization provides the number of specialization areas, this indicates that the organization expects the employee to be expert his or her responsibility. High specialization benefits the organization because it allows individuals to become specialized in their responsibilities so that they can increase efficiency and productivity as a result (Schilling, Vidal, Ployhart, & Marangoni, 2003).

2.9.2 Types of Organizational Structure

Several scholars propose different types of organizational structure, e.g., Burns and Stalker (1961); Mintzberg (1983); Lawrence & Lorch (1967); Zalman, Duncan, and Holbek (1973). Burns and Stalker (1961) were the first to illustrate organizational structure types to determine the relationship between management and organizational structure associated with the organization's changing environment. They developed two different types of organizational structures were organic and mechanistic. Different organizational structures might be helpful in different situations (Burns & Stalker, 1994). Organic and mechanistic structures are defined by three general elements: specialization, formalization, and centralization. The organic structure is flexible and quickly responds to change (Burns & Stalker, 1994). The organic structure characteristics present decentralization, open different opinions, few rules and procedures, quick communication, is non-hierarchical, employs teamwork, and knowledge is located anywhere. The organic organization's characteristics are suitable for dynamic environments because they can change employee activities in the organization efficiently.

Furthermore, previous research found that organic structure has a positive impact on innovation performance. Lawson and Samson (2002), for example, pointed out that the organization’s organic structure is an appropriate environment to initiate innovative ideas and to implement them (Lawson & Samson, 2002). Technology has a strong correlation with structure, so that the organization needs to adapt to organic structure (Fagundes et al., 2010). However, Colarelli O’Connor (2008) claims that only organic structure is not enough to generate innovation; teamwork or groups should develop their competencies and processes relevant to their operation (O'Connor, 2008). According to the contingency theory, organizations are open systems that need to respond and adapt to the environment to be organic structures when the organization needs to implement innovation successfully (Oshita, Pavão, & Borges, 2017).

However, Burn and Stalker (1994) studied the impacts of external factors on the organization. They found that a mechanistic structure is more effective when the external environment is stable (Burns & Stalker, 1994). It is easy to maintain needs

and predictability when the organization operates in stable environments. The mechanistic structure is defined as the organization that uses hierarchical management with central control functions. The characteristics of a mechanistic structure reflect high formalization in rules and procedures, focusing on specialization and vertical communication channels. In general, the mechanistic structure has a more rigid structure than the organic structure and is always found in a stable environment (Burns & Stalker, 1994). The mechanistic structure is perceived as having both a positive and negative effect on organizational innovation performance. The mechanistic structure facilitates some innovation depending upon the organizational goals and environmental conditions. A mechanistic structure promotes incremental innovation and administrative innovation because formalization, top-down management, and centralized authority are needed when the organization needs to change policies, objectives, structure, and human resource management (Damanpour & Gopalakrishnan, 1998; Gatignon, Tushman, Smith, & Anderson, 2002). Although mechanical structure provides efficiency and predictability, it is insufficient to promote innovation because it inhibits creativity and innovation (Rådesjö & Sandström, 2013). Decentralized can increases participation and collaboration on the part of employees so that organic structure promotes innovation rather than mechanical structure (Boukis, 2016). According to Burns and Stalker (1994), organic systems facilitate innovation processes and creativity rather than mechanistic structures (Burns & Stalker, 1994). Previous studies have shown that mechanistic structure does not support innovation when compared with organic structure because mechanistic structure hinders the dynamic capabilities underlying creativity and the innovation process (Aiken & Hage, 1971; Bucic & Gudergan, 2004; Jimenez-Jimenez & Sanz-Valle, 2008; Lawson & Samson, 2001; Oshita et al., 2017; Rådesjö & Sandström, 2013)

However, Lawrence and Lorsch (1967) pointed out that both mechanical and organic structures can coordinate to reflect the developing hybrid of the organizational structure called “ambidextrous organizations” (Lawrence & Lorsch, 1967). Burns and Stalker (1994) explained that the relationship between innovation and mechanical and organic structure in figure 2.4. It shows that each organizational

structure is suitable for the innovation process in a different situation. The organization applies two types of structure. At the idea generation stage, organizations need more organic structure to open new and creative ideas. However, at the implementation stage, the organization should become more mechanistic in order to control behavior and management.

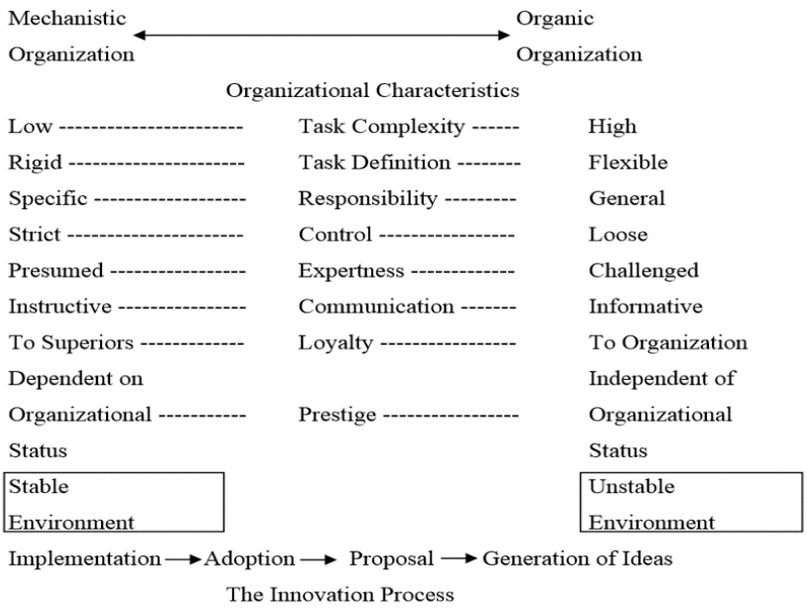

Figure 2.4 Organizational Characteristics
Source: Burns and Stalker (1994)

The study from Alice (2004) supports this view by showing that innovation is supported by a combination of mechanical and organic structures (Lam, 2011). It could be said that the suitable organizational structure for innovation might be both mechanistic and organic structure—it depends on the type of innovation that the organization adopted and the stage of the innovation process.

2.9.3 Organizational Structure and Innovation

Organizational structure has been presented as one of the organization's components that can foster its innovative capacity (Andrews, 2010; Maijoor & Witteloostuijn, 1996). Organizational structure shows the division of work, cooperation, the hierarchy of authority, the span of control, and internal

communication that impacts information flow and idea exchange. These impacts can hinder successful innovation processes, e.g., idea generation and experimentation. Previous research shows the connection between organizational structure and innovation but found different results and directions of the impacts (Chang & Hughes, 2012; Jansen, Bosch, & Volberda, 2006; Zhang, 2012).

From the perspective of innovation, organizational structure can influence resource allocation, support internal and external communication, and support organizational capacity to respond to the environment (Chen, Damanpour, & Reilly, 2010). Organizational structure is one of the organizational resources that can reinforce its ability to innovate (Andrews, 2010; Maijoor & Witteloostuijn, 1996). How organizational work is divided, delegated, and coordinated affects cooperation and internal communication, impacting the free flow of information and exchanging ideas and favors, or hinders experimentation, generation, and the dissemination of new knowledge (Dekoulou & Trivellas, 2014). An organization that follows standards, rules, and procedures can reduce its creativity and innovative thinking. Because of the staff's ideas, behavior, and ability are not allowed to create new ideas or develop innovatively (Hartline, Maxham III, & McKee, 2000). Burns and Stalker (1994) illustrated that the organic structure that focused on flat structure, decentralized, and flexible can catalyst innovation (Burns & Stalker, 1994). On the other hand, other researchers have argued that structural formalization fosters the generation of ideas and suggestions, favoring the enhancement of organizational routines (Zollo & Winter, 2002).

Mintzberg's typology shows the most commonly used structural dimensions in empirical research: formalization, centralization, and specialization (Meirovich, Brender-Ilan, & Meirovich, 2007; Olson, Slater, & Hult, 2005). Previous study found the positive and negative effects of formalization, centralization and specialization, and innovation performance.

A central assumption concerning formalization shows the advantages and disadvantages (Bodewes, 2002; Mattes, 2014; Prajogo & Mcdermott, 2014; Song, Im, Van Der Bij, & Song, 2011). The advantages of formalization help organizations to promote the consensus of rules and regulations and clarify strategic orientation, which affects the organizational process (Abdallah & Langley, 2014; Song, Im, Bij, & Song,

2011). Formalization can strengthen idea generation in the innovation process because it can improve daily routine work to achieve standardization (Zollo & Winter, 2003). Further, formalization importantly promotes the knowledge creation that arises when an organization receives new knowledge (Cowan & Jonard, 2004). This knowledge can influence the transformation into an innovative and competitive advantage (Dekoulou & Trivellas, 2017). However, many scholars have found the negative effect of formalization on innovation (Bodewes, 2002; Burns & Stalker, 1994; Damanpour, 1991; Fréchet & Goy, 2017; Mattes, 2014; Mintzberg, 1983). A meta-analysis of Damanpour (1991) for example showed a non-association between innovation and formation (Damanpour, 1991). Other researchers also have found that formalization affects novelty and causes conflicts regarding strict rules, regulations, policies, and methods (Avadikyan, Llerena, Matt, Rozan, & Wolff, 2001; Mattes, 2014). Mattes (2014) found that employees concurrently facilitate flexibility in daily work (Mattes, 2014). The characteristics of a flexible organizational structure provide informal coordination and encourage the novelty and sharing of knowledge. Moreover, placing importance on flexibility shows that informal communication using face-to-face contact and day-to-day interaction shows the distribution power of trust between actors (Mattes, 2014). A flexible organizational structure facilitates exploration and enables operating mechanisms rather than formalization that hamper innovation (Balconi, Brusoni, & Orsenigo, 2010). Centralization has a positive relationship with innovation performance regarding information flow from bottom to top management through a hierarchical organizational structure. Empirical studies have shown that centralization can promote innovation (Ahuja & Morris Lampert, 2001; Duncan, 1976; Mintzberg, 2000; Zhang, Linderman, & Schroeder, 2012). Duncan (1976) found that centralization promotes innovation at the implementation stage (Duncan, 1976). According to Mintzberg (1989), the mechanistic organization focuses on control orientation with high centralization for controlling a quick response to environment change (Mintzberg, Waters, David, & Bowman, 1989). A mechanical structure usually uses a top-down process so that high centralization in decision-making is needed to bring about innovation. Moreover, centralization can facilitate knowledge sharing that improves innovation performance (Zhou & Li, 2012). Centralization improves innovation output by reducing communication and

coordination costs because it reduces time-consuming coordination and solves disagreements (Argyres & Silverman, 2004; Cardinal, 2001).

Furthermore, a centralized organization is beneficial for innovation because there is better coordination of information between functional areas. However, decentralization shows the right to decide to facilitate rapid responses to new information and provide more detailed input into a decision due to the decisions made lower down in the hierarchy (Martínez-León & Martínez-García, 2011). On the other hand, decentralization is essential for encouraging participation, initiating creative ideas and innovation, and creating a flexible environment for the employee to decide and implement to build a competitive advantage. Moreover, decentralization will benefit top management in terms of decreasing workload and enabling management to focus on core issues. Previous studies have shown that decentralization is positively associated with innovation (Darvishmotevali, 2019; Lee et al., 2016; Lin & Chen, 2013; Madanoglu, Altinay, & Wang, 2016; Popa, Soto-Acosta, & Martinez-Conesa, 2017; Puranam, Singh, & Zollo, 2006).

A decentralized structure facilitates the development and initiation of novel products and services and pioneering organizational practices (Cosh, Fu, & Hughes, 2012; Damanpour, 1991). Decentralization provides empowerment and participation to respond to the environment in order to improve one's ability and to apply knowledge and experience to better innovate performance. Additionally, participatory work increases employee involvement and engagement and reduces employee resistance to change (Damanpour, 1991). The leader supports autonomy and resources to increase innovative work behavior that will lead the organization to successfully implemented innovation (Yuan & Woodman, 2010). Darvishmotevali (2019) supports this view by illustrating that creative ideas are derived from trust and respect because employees feel that their work is profoundly meaningful and vital (Darvishmotevali, 2019). According to Robin et al. (2003), the organization that follows innovation must be organic because it requires greater decentralization, flexibility, and deep specialization (Robbins & Judge, 2010).

Specialization can support more difficult innovation because it requires more specialists to search for new solutions with individual specialization (Baldridge & Burnham, 2006; Damanpour & Gopalakrishnan, 1998). Boschma and Weterings

(2005) also found that organizations are more productive in innovation when they have specialists in the department (Boschma & Weterings, 2005). For example, radical and technical innovation favors specialists' concentration and in-depth understanding and analyzing organization knowledge that promotes innovation (Damanpour, 1991; Dewar & Dutton, 1986). Mechanistic organizations always use a robust specialized hierarchy because they manage under stable conditions (Burns & Stalker, 1994). The differentiation in the structural units in a mechanistic organization creates more specialists that can handle specialized tasks to find new solutions and initiate new systems to achieve goals and to promote innovation (Baldridge & Burnham, 2006).

On the other hand, low specialization can benefit the organization as it allows for more flexibility in a broader array of tasks that employees can perform (Lloria, 2007). Burns and Stalker (1994) pointed out that high specialization increases the costs of cooperation and decreases the organization's flexibility to react to the internal and external environment (Burns & Stalker, 1994). Empirical studies have shown that specialization restricts the flow of creative idea and hampers innovation because the higher the specialization, the lower is the ability to develop innovation (Andersson, Quigley, & Wilhelmsson, 2005; Baldridge & Burnham, 2006; Jaakkola & Hallin, 2018)). According to Baldridge and Burnham (2006), low specialization is needed when the organization applies organic structure because fast-changing products, services, and technology require a bottom-up process to run in order to achieve the innovation (Baldridge & Burnham, 2006). Feldman (1999) has pointed out that specialization does not foster innovation output, regarding technological knowledge (Feldman, 1999). For example, initiative innovation requires knowledge diversity and inclusion in order to generate more creative ideas. Andersson et al. (2005) supported this idea by demonstrated that specialization does not need to be used in some types of innovation, but diversity is required to manage innovation successfully (Andersson et al., 2005).

In conclusion, formalization, centralization, and specialization impact innovation in both positive and negative ways; it depends on the type of innovation that an organization has designed, the stage of the innovation, and the environmental conditions. Formalization performs idea generation in order to achieve organizational

standards. However, new ideas can arise informally so that a flexible organizational structure can encourage creative ideas and facilitate exploration in different contexts. A centralized organization improves efficiency in terms of controlling from top to bottom, especially in decision-making during the implementation phase of the innovation process. On the other hand, centralization restricts the initiation of new ideas and participation in the innovation process. Specialization is required when organizations need specialists in particular tasks to initiate new services and products. Nevertheless, specialization does not support some innovation that is needed in a fast-changing environment, so the diversity of knowledge is necessary.

2.10 Organizational system

Systems are the processes of the organization, which reveal the daily activities and how decisions are made. Systems are the organization's area that determines how the mission is done, and it should be the primary focus for leaders during organizational change (Ravanfar, 2015). The organization system that the researcher focuses on in this research is the communication system, resource management, knowledge, and information management. The literature review shows that communication systems, resource management systems, and knowledge management are the most relevant for promoting innovation in the organization (Damanpour, 1991; Hewitt-Dundas, 2006; Klingebiel & Rammer, 2011; Louise, 2002; Martins & Terblanche, 2003; Mast, Huck, & Zerfass, 2005; Wilson, 2007).

2.10.1 Communication

Communication shows the interaction between people for exchanging information (Zulkepli, Hasnan, & Mohtar, 2015). Communication between employees in the organization is vital for sharing experiences and knowledge-related tasks. Communication can be divided into internal communication and external communication (Zulkepli et al., 2015). The internal communication that exists within organizations among employees emphasizes effective communication. Internal communication creates awareness regarding innovation matters (Mast et al., 2005), motivates staff and, creates an innovation culture (Benner & Tushman, 2003) .

On the other hand, external communication focuses on stakeholders from outside the organization. External communication is essential for creating an organization's image and recognition because people can perceive organizational activities through communication. Organizations with excellent external communication demonstrate the organizations' innovative characteristics because they can convey their image as active and influential. Moreover, it helps to encourage all stakeholders to deal with new products and services (Mast et al., 2005).

The purpose of this research is to focus on the internal communication in innovation projects among team members in terms of problem-solving issues, administrative issues, and performance feedback. Internal communication can increase productivity, improve product and service quality, create new products, reduce costs, and generate high-quality ideas for innovation (Conduit & Mavondo, 2001). There are many channels by which an organization can use internal communication, such as face-to-face communication, email, and group meetings. Communication is effective when individuals receive feedback on their initiatives from leaders. Empirical studies show that fluency in internal communication correlates with generating new ideas and commitment to the task performance among employees' successes (Damanpour, 1991; Monge, Cozzens, & Contractor, 1992; Ruppel & Harrington, 2000). Damanpour (1991) found that internal communication positively affects organizations' innovation process because ideas are shared and integrated between meetings or face-to-face contact in the innovation process using two-way communication (Damanpour, 1991). Two-way communication is needed for participation and collaboration in the innovation process because individuals obtain benefits when they receive feedback for improvement (Bonsón, Torres, Royo, & Flores, 2012).

Further, effective internal communication, especially in face-to-face and close contact, leads to success in experimentation and implementation (Kivimäki et al., 2000). Internal communication may include two kinds of interaction: formal and informal (Kraut, Fish, Root, & Chalfonte, 2002). The communication system in both formal and informal communication positively influences the organizational processes and development. Formal communication is an official message sent by the organization (e.g., meetings, reports, and other types of information flow). This type

of communication is necessary for the innovation process (Kivimäki et al., 2000). It can help with the fixation of responsibility and maintain the authority relationships in the work process.

On the other hand, informal communication occurs when people talk about their work and share information, vision, and resources with peers. A previous study found a relationship between formal and informal communication in relation to the innovation process (Luoma-aho & Halonen, 2010; Watanavisit, 2017) , for example, Katarina and Monika (2015) found that formal and informal communication can support innovation (Katarína & Monika, 2015). Furthermore, Watanavisit (2017) found that informal communication in innovation was positively correlated with innovation, especially in the open innovation climate of an R&D organization (Watanavisit, 2017). Organizations need to consider effective communication for sharing the knowledge and information used in the organizational context. Communication of innovation can be systematically planned to create understanding and trust between members of the organization. A high level of communication contributes to all stages of the innovation process, especially during the development process.

2.10.2 Resource management

Organizations need to utilize resources for their achievement. Resources can be defined as tangible and intangible assets essential to the organization controlled by an organization in order to develop and set strategies to increase productivity (Barney, 2001; Maijoor & Witteloostuijn, 1996). Tangible assets involve people, tools, equipment, money, technology, and products, whereas intangible assets cover knowledge and organizational information, and employee skills (Hunt et al., 2002). Organizations that provide quality and sufficient resources dedicated to a task will lead to a successful organization in its innovative activities. On the other hand, organizations that allocate insufficient resources do not support strong performance (Klingebiel & Rammer, 2011). The empirical research shows that higher resource allocation can increase innovative performance and novelty of innovation output (Ding & Eliashberg, 2002; Klingebiel & Rammer, 2011). Moreover, resource management can be correlated with service innovation as resources are exchanged in

collaboration in order to create organizational performance (de Vries, 2006; Kandampully, 2002; Lawson & Samson, 2002; Leiponen, 2006; Lievens & Moenaert, 2000). When an organization combines resources with unique manners such as the organizational culture, management skills, knowledge, and information, resources deliver strategic opportunities (J. B. Barney, 2001). It is usual to combine all of the needed resources more than a single resource because a single resource is rarely the organization's main success factor. The organization integrates resources in order to stimulate innovation successfully. If resources are abundant, policies or programs should become more relaxed and can adapt to innovation projects. This means that potential innovative programs are more likely to be accepted (Suwannathat, Decharin, & Somboonsavatdee, 2015). Klingebiel and Rammer (2012) also have pointed out that the amount and quality of resources dedicated to the task demonstrate what an innovative organization is (Klingebiel & Rammer, 2012). A study of Lawson and Samson (2002) found that resource management links with organization strategy because strategy determines the arrangement of resources that organizations adopt in order to deal with environmental uncertainty (Lawson & Samson, 2002). Therefore, Lawson and Samson (2002) provided a model of organizational capability; they found that valuable resource allocation is one of the critical success factors for this capability (Lawson & Samson, 2002). They also proposed that organizations should have the competence to manage and allocate resources appropriately by developing three critical aspects of organizational capability: encouraging risk-taking, stimulating innovation potential, and creating new innovative practices fundamental to ensure creative output.

The resource-based view (RBV) shows that when organizations have complex resources to imitate and create value, they can produce a competitive advantage (Barney, 2001; Collins & Smith, 2006). RBV suggests that the combination of skills and unique resources can maintain and increase differentiation. According to previous studies, different organizational resources positively affect the innovation process and its capability to innovate (Kamasak, 2015; Kostopoulos, Spanos, & Prastacos, 2002). Barney (1991) classified resources according to the following three categories in order to formulate strategies to improve the organization's overall performance (Barney, 1991).

First, the empirical research shows that physical resources (e.g., financial, IT systems, and equipment) have a positive effect on innovation because they can the innovative output (Kostopoulos et al., 2002; Mitchell & Zmud, 1999). Financial resources can develop the organization's capacity to support innovation activities (Hewitt-Dundas, 2006). Organizations with supporting funds in R&D and innovation processes are more successful in innovative projects (Kostopoulos et al., 2002). Moreover, technology also affects the innovation process because it enables the development of new technologies in services, processes, and products to facilitate innovation and fosters continuous process improvement. Physical resources are located in an organizational system and work routines, and individual people (Miranda & Figueiredo, 2010). Each level of organization may use different physical resources depending on the production and organizational processes.

Second, human resources include skills, experience, training, and education. Human resources in RBV refers to the human capital pool in terms of skills, knowledge, expertise, and willingness to achieve a sustainable competitive advantage (Nyberg, Moliterno, Hale Jr, & Lepak, 2014; Wright et al., 2001). Human resources are an essential resource in creating and managing employee knowledge, skills, and experience, which are organization-specific resources that are difficult to obtain and difficult to imitate (Kim, Song, & Triche, 2015).

Developing employee skills and providing ways to optimize their performance through training or learning are procedures through which human resources can contribute to its innovation process.

Third, organizational capital resources are the set of intangible assets that are used to develop organization activities and output quality, which reflects higher performance (Martín-de-Castro, Navas-López, López-Sáez, & Alama-Salazar, 2006). These include norms, rule planning, coordinating systems, and the organizational culture to develop organizational competence. Organizational capital resource supports the development of physical and human resources; without this resource, the development cannot unfold (Bueno et al., 2011). Moreover, if the organization cannot manage properly, it will not allow for the unfolding of all resources. Previous literature on RBV has highlighted that organizational capital is assumed to support any other intangible resources or intellectual capital developed within the organization

(Martín-de-Castro et al., 2006). The organization's resources have to be consistent with all the organization's functions to complement each other and respond to the environmental demands. Furthermore, if managed properly, it can turn into assets that are challenging to imitate and enables the organization to sustain its competitive advantage.

2.10.3 Knowledge Management System

Ichijo and Nonaka (2007), who studied knowledge creation, consider that knowledge is necessary for innovation created for organizational competitiveness (Ichijo & Nonaka, 2006). Knowledge is essential for the innovation process, especially tacit knowledge (Obeidat, Al-Suradi, & Tarhini, 2016). Innovative organizations transform general knowledge into specific knowledge in order to create and transform processes, products, and services. Effective implementation of knowledge in the innovation process can bring about faster development of new products and services, optimize R&D performance, and differentiate products and services (Matthews, 2003). Knowledge Management (Beckmann, Schaarschuch, Otto, & Schrödter, 2007) can be defined as the explicit and systematic management of vital knowledge and its associated processes of creation, organization, diffusion, use, and exploitation (Prusak & Matson, 2006). On the other hand, KM is a structured process with activities that capture, discover, create, filter, evaluate, store, share, and apply knowledge from individuals in order to advance business processes and to meet organizational goals (Karanja, 2009). When employees share and exchange knowledge, the level of participation increases, and knowledge contributes to innovative ideas. KM helps the organization make sure that the accessibility of both tacit and explicit knowledge assists the steady growth of the knowledge base by gathering and capturing explicit and tacit knowledge. KM identifies gaps in the knowledge base and provides processes to fill in the gaps in order to support innovation (Eardley, 2010). Salojrvi et al. (2005) suggested that the whole organization must share a prevailing KM direction because KM is central to its capacity to grow and compete (Salojärvi, Furu, & Sveiby, 2005). The point significant attention of KM is innovation (Amalia & Nugroho, 2011; Søderberg & Holden, 2002; Wilson, 2007; Xu, Houssin, Caillaud, & Gardoni, 2010). The KM system expands the

creativity to enhance the innovation process and to gain new knowledge and to make the entrance process faster and more efficient. Thus, KM is an essential success factor when the organization “kicks off” new products and services.

Empirical studies highlight the factors influencing innovation in knowledge management (Kim & Mauborgne, 2005; Lin, 2007; Plessis & Africa, 2007; Wilson, 2007). Plessis (2007) found that it is vital to consider knowledge management when the leader brings innovation to the organization or creates innovation because innovation depends upon knowledge (Du Plessis, 2007). Wilson (2007) proposed that innovation transforms knowledge into new products and services (Wilson, 2007). Further, Carneiro (2000) proposed a model that shows the relations among KM, innovation, and competitive advantage by analyzing the relationships among KM, organization competitiveness, and innovation advancement. It also found that KM positively influences innovation and competitiveness (Carneiro, 2000). KM is considered necessary for intellectual capital and is a strategic management instrument for improving product development and the innovation process. KM improves the conditions for decisive action for innovation in terms of creating new products and treating problems. Additionally, Darroch (2005) found that KM is a cooperation mechanism for fostering organizational performance and innovation (Darroch, 2005). However, Ju et al. (2006) suggested that the organization learns from outside sources in order to obtain a competitive advantage (Ju, Li, & Lee, 2006). Effective KM helps organizations analyze upcoming trends, acquire new skills, and reduces uncertainty (Nowacki & Bachnik, 2016). Various studies on KM and innovation has been mentioned; three components include knowledge sharing, knowledge acquisition, and knowledge application that are useful for promoting organizational innovation.

First, Knowledge acquisition is the process of acquiring knowledge that is available, and it refers to the use of existing knowledge or capturing new knowledge (Kim & Mauborgne, 2005). Organizations can acquire knowledge from both internal and external sources. The organization can gain knowledge from internal sources using explicit knowledge from existing documents or its people’s tacit knowledge in its repositories (Lin, 2007). On the other hand, an organization can acquire knowledge from external sources by employing individuals with the required knowledge and purchasing knowledge assets such as patents and research documents (Sudhir, 2003).

Knowledge acquisition is comprised of obtaining and collecting knowledge from the external environment and gathering essential knowledge in order to perform the organization's operations (Gold, Malhotra, & Segars, 2001; Liao & Wu, 2009; Zahra & George, 2002). Previous literature shows that knowledge acquisition has a positive relationship with organizational performance and innovation (Seleim, Ashour, & Bontis, 2007; Xiong & Deng, 2008). Consequently, the organization can takes advantage of new opportunities by exploiting acquired knowledge to produce innovative results (Huang & Li, 2009).

Second, knowledge sharing is the process of spreading knowledge via communication channels among the organization's members (Awaja, Awaja, & Raju, 2018; Chiang & Hung, 2010). Knowledge sharing has the objective of creating knowledge by integrating the background and experiences of employees. Knowledge sharing is considered valuable input for innovation because it enables the organization to increase its innovation ability and leads to the development of a well-established system (Habi, Anderson, & Amamou, 2011). Knowledge in the organization can be shared through meetings, the Internet and intranet, and policies and procedures that should have easy access for all levels of employees (Anvary Rostamy & Shahaei, 2009). Knowledge sharing is essential to the organization because it allows employees to access knowledge, reducing time to gather information easily. Thus, the organization can transfer its valuable resources to the innovation process more quickly. Additionally, knowledge sharing can increase learning participation and create new knowledge for the development of innovative ideas (Chen & Huang, 2009). Knowledge sharing has been a focus as a critical component impacting innovation. Empirical studies have found that knowledge sharing is an essential element in innovation (Sher & Lee, 2004; Taminiau, Smit, & De Lange, 2009; Xu, Houssin, Caillaud, & Gardoni, 2010)Wang and Wang found that knowledge sharing promotes better performance for an organization to achieve innovation (Wang & Wang, 2012). The sharing of knowledge among groups in the organization means that the existing creative ideas from one group are transferred to another resulting in new products and services (Kamaşak & Bulutlar, 2010). Shared knowledge improves the organization’s existing products and services for exploitative innovation (Bierly III, Damanpour, & Santoro, 2009). Moreover, sharing knowledge among employees often

helps the organization successfully adopt new ideas, products, and services, which leads to innovation. Creativity and innovation are enhanced when employees share their experiences and gather knowledge with others (Awaja et al., 2018).

Third, knowledge application is a process that focuses on substantial knowledge (Awaja et al., 2018). Knowledge application aims to use current knowledge to solve existing problems and to make knowledge more active in creating benefits for the organization (Alavi & Leidner, 2001; Bhatt, 2001). It recognized that applying knowledge to develop organizational performance is the ultimate goal of KM (Nguyen, 2011). Organizations increase the ability to manage different sources and types of knowledge to apply knowledge effectively. Applying knowledge in a suitable form will decrease mistakes in the innovation process (Alavi & Leidner, 2001; Chen & Huang, 2009). Moreover, knowledge application develops an organization's capability that makes decision-making and problem-solving easier for organizations. New product development and innovation require specialized knowledge from many different areas (Yli-Renko, Autio, & Sapienza, 2001). Previous research found that knowledge application effectively manages and utilizes knowledge in the innovation process (Chen & Huang, 2009; Donate, 2015;Sarin, 2003). When employees apply knowledge effectively, they will reduce redundancy, increase the speed in producing new products and services, and develop more innovative production processing (Sarin & McDermott, 2003). Furthermore, knowledge application helps the organization find new knowledge opportunities that can more effectively engage with its innovation (Y. Li et al., 2006). Knowledge application also benefits innovation because employees have access to appropriate information and essential knowledge within the organization. The leader must know how to apply organizational knowledge effectively in order to enhance innovation in the organization.

2.11 Conceptual Framework and Hypotheses

2.11.1 Hypotheses

There are certain factors that influence organizations to undertake innovation. It is expected that the kinds of factors mentioned above will make a relevant and

valuable contribution to public sector innovation. Thus, the analysis in the present work is addressed to measure the effects of the identified factors that can lead to a practical impact on public service innovation in government agencies.

Hypothesis 1: Innovative leadership has a positive effect on innovation management effectiveness.

The relationship between leadership and public service innovation effectiveness shows that leadership is an integral part of innovative organizational performance (Denti & Hemlin, 2012; Soosay, 2005). The leader constructs the environments that favor creativity and, ultimately, innovation (Denti & Hemlin, 2012; Shalley & Gilson, 2004). Many types of research on leadership focus on the essential leadership actions in the construction of context and the opportunities that promote innovation's bottom-up processes. Leaders promote intrinsic motivation (Avolio et al., 1999), facilitate problem-solving (Tierney et al., 1999), foster a positive team climate (Avolio, 1999; Tierney et al., 1999), and establish and maintain high-quality work relationships with team members (Olson et al., 2005). Further, in the top-down process, leaders manage the strategic innovation goals and activities of their organizations; leaders may set these goals and direct these activities by managing time, facilities, money, and knowledge resources by establishing and achieving individual and team goals. Moreover, the leader sets targets by defining expectations for creative performance (Shalley & Gilson, 2004) by managing rewards (Mumford et al., 2002), and by granting autonomy to individuals and teams (Denti & Hemlin, 2012; Hunter, Bedell, & Mumford, 2007). For instance, Krause (2004) study leadership and innovation; the result shows that *"*providing freedom and autonomy and using expert knowledge and information have the most positive effect on innovative behaviors, and the most negative effect on innovation blocking behaviors" (Krause, 2004).

Hypothesis 2: Innovation strategy has a positive effect on innovation management effectiveness.

Strategies support successful innovation processes. The success of implementing innovation strategies can have a significant effect on innovation performance in the organization. The literature discusses the determinants of improving innovation performance. An organization with integrated innovation as a

part of the organization's vision and mission can be an innovative organization (Fruhling & Siau, 2007; Li & Atuahene-Gima, 2001; Nybakk & Jenssen, 2012). It is expected that strategies will show great results in developing innovations (Borins, 2001; Potts & Kastelle, 2010). Mar and Bermejo (2017) also found that implementing effective strategies significantly affects applying innovation in public service (Mar & Bermejo, 2017). Further, Stowe and Grider (2014) studied strategies for advancing organizational innovation (Stowe & Grider, 2014). Scholars have suggested that an organization should develop organizational strategies that promote innovation in order to create an innovative organization. Supriyadi and Ekawati (2014) conducted the following study: "The Effect of Strategic Partnership on Innovation Capability and Business Performance of the Garment Industry in West Java-Indonesia." The results showed that the strategic partnership has a positive and significant effect on the organization's innovation abilities (the regression analysis showed the value of the coefficient of determination at 0.249) (Supriyadi & Ekawati, 2014).

Hypothesis 3: Organizational culture has a positive effect on innovation management effectiveness.

The studied documents showed that an organization's culture plays a vital role in innovation in public and private organizations. The culture gives an organization a unique identity (O'Donnelle & Boyle, 2008). If the leader creates a common culture that can be successful, it can lead to competitive advantage and successful work performance (Ramachandran, Devarajan, & Ray, 2006). Loewe and Dominiquini (2006) stated that organizational culture is crucial for successful innovation implementation (Loewe & Dominiquini, 2006). They also pointed out that the features of innovative organizations should involve being an open culture, cooperative, and offering rewards for successful implementation. Szczepańska-Woszczyna (2015) studied the impact of organizational culture on innovation in the company; the results showed that organizational culture may be favorable to innovative activity (Szczepańska-Woszczyna, 2015). Thus, it is crucial to appropriately shape the pro-innovation organizational culture because innovation is often the element determining the competitive position in the market. Krivokapic and Kavaric (2015) studied the public sector context and found that the organizational culture changes strategies is an instrument for changing the attitudes, values, and

behaviors of employees (Krivokapic & Kavaric, 2015). Therefore, the changes in the organizational culture must be consistent with the changing mechanisms of public administration.

Hypothesis 4: Organizational structure has a positive effect on innovation management effectiveness.

The public organization's innovation has a close relationship with organizational structure because of the organizational structure linkage with the organizational design that causes innovation (Arad, Hanson, & Schneider, 1997). Martins and Terblanche (2003) pointed out that organizational structure affects creativity and innovation in the organization (Martins & Terblanche, 2003). The flat structure shows flexibility, autonomy, work for the team, and decentralization; and the cross-functional team will promote innovation in the organization (De Vries, 2016; Suwannathat et al., 2015). However, structures that have a more centralized, formal, and "tall structure" prevent innovation. The results from Li and Atuahene-Gima (2001) also support the scholars mentioned above; the results showed that *"*centralization negatively influences a unit's exploratory innovation. Accordingly, it reduces non-routine problem-solving and the likelihood that unit members seek innovative and new exploratory solutions*"* (Li & Atuahene-Gima, 2001). In addition, the results from a study of organizational structure and innovation performance in different environments has shown that decentralized decision-making promotes the ability to innovate in most circumstances and is superior to other structures (Cosh et al., 2012). Palmer and Dunford (2002) highlight formalization's positive impact on developing innovative work practices (Palmer & Dunford, 2002). On the other hand, other scholars underline that formalization significantly facilitates the diffusion of new knowledge, its utilization, and transformation into innovative and competitive products or services (Beckmann, Otto, Schaarschuch, & Schrödter, 2007; Green, Inman, Brown, & Willis, 2005).

Hypotheses 5: Human resource management has a positive effect on innovation management effectiveness.

In the literature there has been acceptance of the importance of HRM as a factor of innovation. HR is involved in the whole innovation process for two reasons; first, a firm's innovative capacity resides in intelligence, imagination, and creativity

(Mumford, 2002). Second, HRM's implications and support are essential for developing and implementing innovation (Van De Ven, 1986). The literature has shown that HRM is the primary approach for organizations to form employees' manner, behavior, and skills in order to complete the organization's objectives (Chen & Huang, 2009). Beugelsdijk (2008) stated that HRM influences the innovative organization and is a precious resource for organizations that desire to innovate (Beugelsdijk, 2008). Many scholars have studied human resource management's innovation functions (Beugelsdijk, 2008; Chen & Huang, 2009; Jiang et al., 2012; Jiménez-Jiménez & Sanz-Valle, 2008). Jiang, Wang, and Zhao (2012) did a study entitled: "Does HRM facilitate employee creativity and organizational innovation? A study of Chinese firms," and the result shows that there is a positive effect between recruitment and the selection of employees with the employee's ability to be creative and innovative (Jiang et al., 2012). Li et al. (2006) found the positive effect among training and the innovative technology that can create creative and innovative employees (Li et al., 2006). Tan and Nasurdin (2015) stated that performance evaluation, directly and indirectly, affects innovation management. According to organizational design, the literature highlights that teamwork utilization enhances innovation (Tan & Nasurdin, 2015). In a study of the relationship between performance-based pay and innovation it was found that performance-based pay stimulate initiatives for innovation developments. However, incentives may also negatively affect the staff's motivation and participation in problem-solving if they are not involved in its process (Lau & Ngo, 2004).

Hypothesis 6: The Organizational system has a positive effect on innovation management effectiveness.

The literature on communication shows that effective communication is an important influence for employees to promote innovation (Bouckenooghe & Devos, 2008; Charvatova, 2006; Johnson, Donohue, Atkin, & Johnson, 2001). For instance, a study of communication, involvement, and perceived innovativeness shows that communication, directly and indirectly, impacts perceived innovation (Johnson, Donohue, Atkin, & Johnson, 2001). An open-door communication policy is vital for the design of a culture to support innovation and creativity (Martins & Terblanche, 2003). However, several problems can occur during the innovation process with the

lack of success in communication. Successful communication requires a mechanism that solves disagreements and improves the clarity of communication across the organization (Bessant, 2015). Further, communication plays a crucial role in overcoming resistance to innovations and in reducing the uncertainty related to them. The complexity of most innovations may require more intensive interpersonal interaction in order to arrive at high-quality decisions.

A previous study (An organization's performance in innovation also depends on how it allocates the available resources) found that the quality of resources has a positive impact on a successful organization (Klingebiel & Rammer, 2011). The accessibility of resources, the quality of resources, and resource exchange are necessary for organizational innovation. The resources are also required to search for ideas, conduct experiments, pursue multiple projects, develop and test prototypes, and launch new products. The researchers also found that ability and resource support play an essential role when an organization decides to implement a new policy or project (Srivastava & Moreland, 2012; Suwannathat et al., 2015). For instance, Suwannathat's research (2015) on fostering innovation in public organizations in Thailand revealed some of the factors that affect Thai public organizations. The study found that "at higher levels of innovation, capability resource assets, such as an innovative workforce and collaborative relationships, present the potential to transform ideas into practical innovation outcomes." Organizations often struggle with innovation due to resource constraints (Ahuja & Morris Lampert, 2001).The resource constraints become an even more significant barrier in research projects that involve the pursuit of breakthrough innovations (Srivastava & Moreland, 2012).

Knowledge management capability is the primary key to fostering innovation. Scholars have studied the relationship between knowledge and innovation activities to show the positive relationship between these factors (Nawab, Nazir, Zahid, & Fawad, 2015). Lee (2016) reviewed the association between knowledge management capability and innovation and found that knowledge capability positively affects innovation management (Lee, Min, & Lee, 2016). Tan and Nasurdin (2011) found that knowledge management is an excellent method to develop product and service innovation (Tan & Nasurdin, 2015). Further, Xu et al.'s study (2010) revealed how knowledge had managed innovation in organizations (Xu et al., 2010). Furthermore,

Amalia and Nugroho (2011) confirmed that an effective KM process through knowledge creation, storage, distribution, and application contributes to innovation (Amalia & Nugroho, 2011).

Hypothesis 7: Innovative leadership has a positive effect on innovation strategy

Leadership plays an essential role in forming and implementing a strategy (Jabbar & Hussein, 2017). Leaders are the organization's heart because they are responsible for encouraging the organization to succeed; this success stems from practical decision and effective strategies. When leaders understand innovation and how innovation works, they can see what is missing and the challenge of creating a strategy or plan to make it better (Horth & Vehar, 2012). Each perspective on strategy presupposes certain assumptions about the task of leadership, especially in terms of the emphasis given to controlling, guiding, or shaping the organizational environment (Bouhali, Mekdad, Lebsir, & Ferkha, 2015). Fairholm (2004) states that leaders requires strategic leadership, and a suitable strategy is the process of transforming the organization into an active one (Fairholm, 2004). Furthermore, the leader can set an innovation strategy for the organization and initiate strategic and structural changes to accommodate promising innovations (Horth & Vehar, 2012). In a quantitative study, Zuraik (2016) researched effective leadership for innovation. The result showed that adopting a transformational leadership style in higher executive positions had a positive correlation with innovation management, which included the following skills: inspiring teams about a particular vision and, developing trust to pursue changes in strategies (Zuraik, 2016).

Hypothesis 8: Innovative leadership has a positive effect on organizational culture.

The leaders shape work contexts that contribute to corporate innovation. Additionally, leaders can create and manage an organizational culture that promotes innovation. Empirical studies have shown that promoting an innovation-enabling culture requires senior leaders' support and involvement (Elenkov & Manev, 2005; Jassawalla & Sashittal, 2000; Sosik, Jung, Berson, Dionne, & Jaussi, 2005; Uhl-Bien, Marion, & McKelvey, 2007). Furthermore, scholars have suggested that leadership plays an instrumental role in fostering innovation by affecting the organization's

culture, within which individual behavior is manifested (Farson & Keyes, 2006). Leaders stimulate employees' attempts to deal with old situations in new ways. Leaders provide employees with opportunities to explore, investigate, and experiment; and bounded delegation leadership creates an entrepreneurial organizational culture that fosters innovative behavior (Anand, Gardner, & Morris, 2007; Ulwick, 2002). Though quantitative study, Lin and McDonough III (2011) found that "culture is important to facilitate innovation ambidexterity and further, which leadership and culture work in collaboration with each other to generate innovation" (these yielded the results, $R = 0.47$, $F = 8.10$, $p = .000 < 0.00$) (H. E. Lin & McDonough, 2011). Szczepańska-Woszczyna (2015) found out that the significant factors that repeatedly affect innovation also concern leadership (Szczepańska-Woszczyna, 2015). Therefore, the leader shapes work contexts that contribute to organizational innovation and can create and manage an organizational culture that promotes innovation.

Hypothesis 9: Organizational culture has a positive effect on organizational structure.

The literature shows that organizational culture's influence on organizational structure supports creativity and innovation in terms of values such as flexibility, freedom, and cooperative teamwork that will promote innovation. On the other hand, values such as flexibility, control, stability, and order will obstruct innovation (Arad et al., 1997). Freedom is a core value in stimulating innovation through autonomy, empowerment, and decision-making. Thus, the staffs are free to achieve its goals automatically and creatively within guidelines. The speed of decision-making also can promote or inhibits innovation. O'Reilly and Tushman (2011) claim that cultural norms that lead to quick decision-making should encourage innovation (O'Reilly & Tushman, 2011). Martins and Martins (2002) studied an organizational culture model to promote creativity and innovation found that support for change formed part of the behavior that encouraged innovation in the preliminary model (Martins & Martins, 2002). Employees' willingness to adapt to change formed part of the value of "flexibility" as part of the structure.

2.11.2 Conceptual Framework

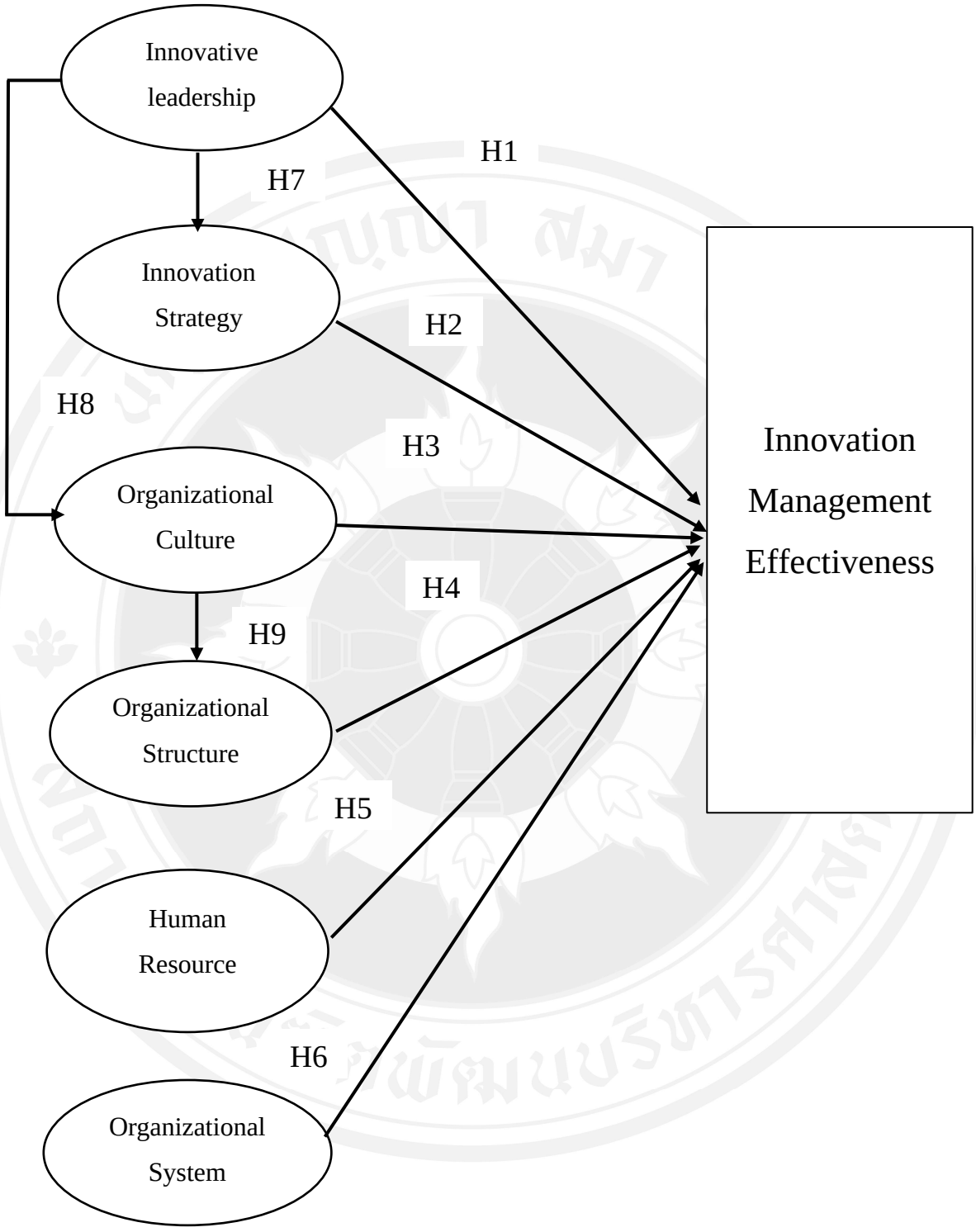

Figure 2.5 Conceptual Framework

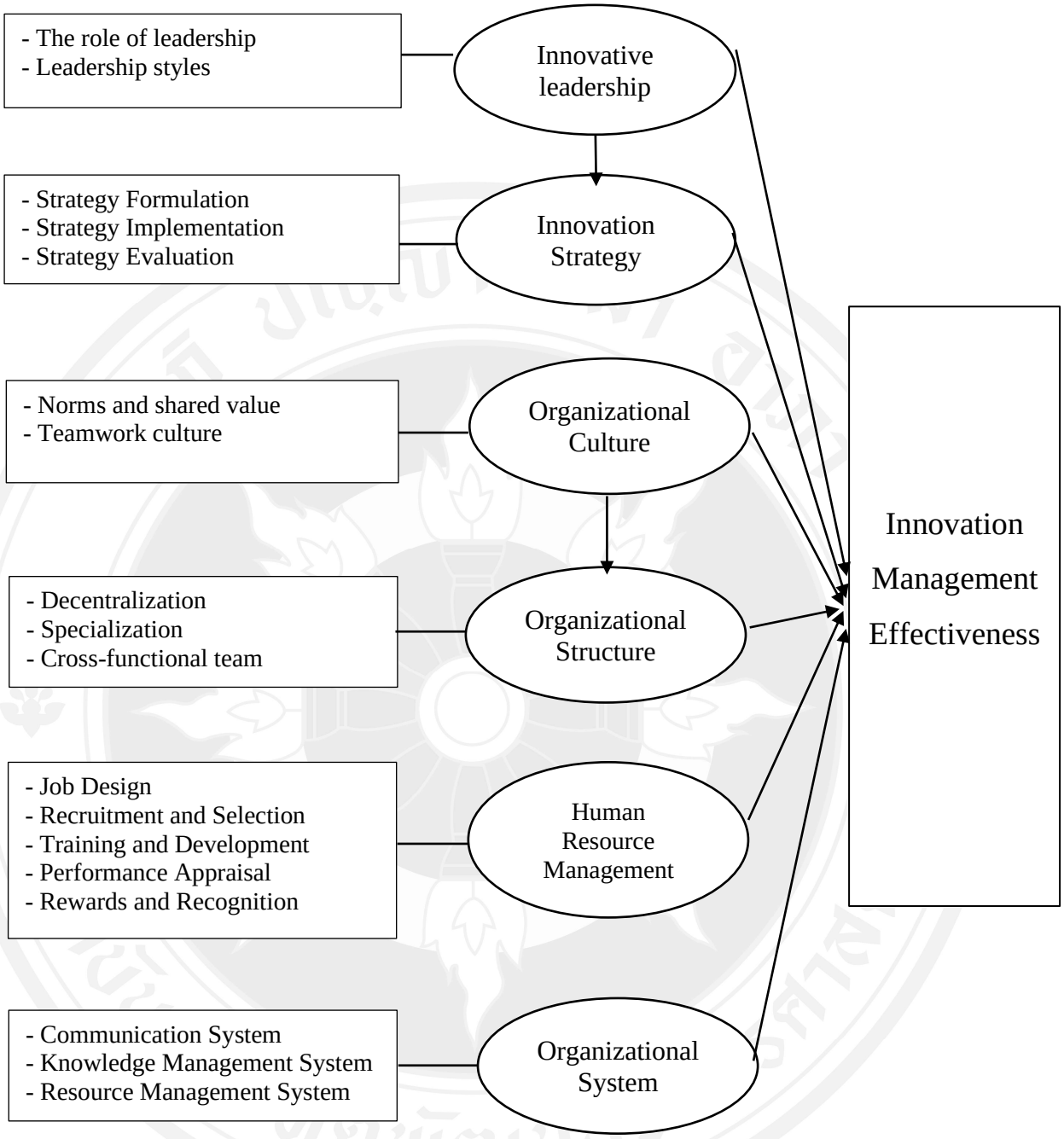

Figure 2.6 Conceptual Framework with Sub-Variables

CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes the research methodology applied in analyzing the relationships of the factors that affect the effectiveness of public service innovation in the awarded organizations in the Thai public sector. The chapter provides details on the research design, the quantitative research, the qualitative research, and reliability and validity. Mixed methods were employed in this study. The primary method of the research was quantitative, integrated with the qualitative method in order to arrive at the quantitative findings, emphasized in terms of the interpretation of the findings.

3.1 Research Design

The study employed a mixed-methods approach for data collection and data analysis. It mainly utilized the quantitative method to emphasize the success factors of awarded organizations in Thai public service innovation. Using mixed-methods can obtain in-depth findings, and this method benefits the research in terms of having greater validity and reliability (Ruhl, 2004). Moreover, mixed-methods help the researcher to have a better understanding of data than the application of either method. A qualitative approach is employed in order to understand and to obtain the meaning from data collected, aiming to answer the research question (Corbin & Strauss, 2014). It provides for depth of understanding and validation in achieving research objectives.

Qualitative data produce a “thick description” of the participant’s attitudes, feelings, and experiences from respondents' opinions. In addition, they provide an interpretation of the meaning of the respondents' actions and contexts rather than measuring facts, which statistical answers can determine (Denzin & Lincoln, 2011; Jankowicz, 2013). The researcher employed the qualitative method throughout the in-depth interviews with the government agencies that received a service innovation award from the OPDC during 2003-2020. These organizations were selected because

the researcher wanted to understand public organizations' determinants and how they fostered public service innovation.

The research also focuses on the determinant factors by employing quantitative analysis through the structured questionnaire and a statistical hypothesis test that provides information on seven elements of innovative leadership, organizational culture, innovation strategy, human resource management, the organizational system, organizational structure, and innovation management effectiveness that foster Thai public service innovation's effectiveness. The quantitative approach was used to support the data from qualitative data. The quantitative analysis findings reveal the relationship and significance between the factors illustrated in numbers. Quantitative research uses numeric data to obtain information because it employs a systematic process and objectives. It can be used to answer the researcher's questions, especially in a survey, to gain the opinions, experiences, knowledge, and attitudes of the respondents (Graziano & Raulin, 2019).

3.2 The quantitative research

3.2.1 Unit of Analysis

The units of analysis are the primary units that are analyzed in any research. They can be at the higher levels, such as social interaction, at the organizational level, or at a lower level, such as the group and individual that the researcher has defined for the research (Babbie, 2020). This study focuses on the determinants that foster innovation effectiveness in Thai government agencies in the awarded organizations. Accordingly, the units of analysis in this study are at the individual level. The list of awarded organizations in the government agencies comprises 36 departments from 10 ministries that account for public services innovation.

3.2.2 Population and Sampling

Population can be defined as "a group of individuals with the characteristics in common that the researcher needs to study and draw conclusions" (Babbie, 2020). On the other hand, sampling is the method of selecting an adequate number from the population. The sampling method also is used to clarify and to make inferences about

the target population (Babbie, 2020; Prajogo & McDermott, 2014). This study's population is the public sectors that received awards in the public sector from the OPDC during 2003-2020. Therefore, the population in this study is 36 departments.

Sampling

It is important to select a sample in order to answer research questions because it is doubtful that the researcher can collect data from the entire population (Taherdoost, 2016). Sampling can be used to make inferences about the population or generalize existing theory (Brewerton & Millward, 2001). In general, the sampling technique can be divided into two types: probability and non-probability methods. Probability sampling allows every item in the population to have an equal chance of being included (Taherdoost, 2016). It has the greatest freedom from bias but may represent a given sampling error level (Suen, Huang, & Lee, 2014 2014). On the other hand, non-probability sampling does not provide all of the individuals in the population an equal chance of being selected (Babbie, 2020). It is easier and cheaper to access and is suitable for selecting a sample regarding the basic knowledge of a population.

The sampling method for this study was both probability and non-probability. The study used the purposive sampling technique as a non-probability method to target departments from three ministries that met the researcher’s criteria. According to their participation in the Thai Public Sector Excellence Awards for public service, the researcher used the criteria for selecting the focal departments as follows.

1) The department got PSEA in the categories of service innovation.

2) The department from different ministries.

3) The focal departments must have the vision, missions, and responsibilities related to public services innovation.

4) The focal department have got to multiple types of award contests, and there is still operate continuously

5) The focal department must be willing to provide the necessary data and information related to the research topic.

As a result, three departments were qualified for being on the department's list that had received awards for many years, and they still operate continuously:

1) Department of Fisheries, Ministry of Agriculture and Cooperatives.

2) Department of Land Transport, Ministry of Transport.

3) Department of Medical Sciences, Ministry of Public Health.

The researcher formulated the sample size by employing the proportional stratified method as a probability method using Taro Yamane's formula (1967) to give the minimum sample size at a confidence level of 95%, as shown below.

Taro Yamane's formula

$$\text{Taro Yamane's formula} \quad n = \frac{N}{1+Ne^2}$$

n = Sample size
N = Number of Population
e = Error rate of sample

Referring to Taro Yamane's formula (1967), the researcher used the sampling table given below to calculate the sample size.

Table 3.1 Sample Size for ±3%, ±5%, ±7%, and ±10% Precision Levels Where the Confidence Level is 95% and P=.5.

Size of Population	**Sample size (n) for Precision (e) of:**		
	±1%	**±5%**	**±10%**
500	a	222	83
1,000	a	286	91
2,000	a	333	95
3,000	a	353	97
4,000	a	364	98
5,000	a	370	98
6,000	a	375	98
7,000	a	378	99
8,000	a	381	99
9,000	a	383	99
10,000	5,000	385	99
20,000	6,667	392	100
23,370	7,003	393	100

Size of Population	Sample size (n) for Precision (e) of:		
	±1%	**±5%**	**±10%**
30,000	7,500	396	100
40,000	8,000	397	100
50,000	8,333	397	100
100,000	9,091	398	100
>100,000	10,000	400	100

a = Assumption of the normal population is poor (Yamane, 1967). The entire population should be sampled.

Source: Yamane (1967)

The total population of this study is 23,370. This population, as shown in the table, is given a precision level of +- 5% and a confidence level of 95%. Therefore, the sample size is 393 sets of questionnaires are recommended for this research. The details of the sample size are shown in the table above. However, the minimum size for structural equation modeling should be 150 (Anderson & Gerbing, 1988). Hair, Black, Babin, Anderson and Tatham (2006) conclude that the level of 200 is small but reasonable (Hair, 2011). Thus, the sample size in this study passed the criteria. The sample size for the four departments contributing using simple random sampling is shown below.

Table 3.2 The Population and Sample of Public Sector

Name of Departments	Population	Sample
1.The Department of Fisheries, Ministry of Agriculture and Cooperatives	8,566	144
2. Department of Land Transport, Ministry of Transport	6,022	101
3.Department of Medical Sciences, Ministry of Public Health	8,782	148
Total	**23,370**	**393**

3.2.3 The quantitative research instrument

The quantitative research instrument used in this research was a rating scale questionnaire. The process of developing the research instrument can be explained as follows.

1) Study the concepts, theories, research, and documents related to public service innovation management in a public organization and the determinants affecting the innovation management effectiveness comprising innovative leader, innovation strategy, organizational culture, human resource management, organizational structure, organizational system, and innovation management effectiveness.

2) Determine the structure and definition of each variable.

3) Develop the questionnaire, which consists of seven parts as follows.

Part 1 develops questions on the general information about the respondents, including gender, highest educational level, job position, and work duration.

Parts 2-7 comprise 98 questions about innovative leadership, organizational culture, innovation strategy, human resource management, organizational structure, organizational system, and innovation management effectiveness. The variables were measured with a 6-point rating scale ranging from strongly agree to agree, slightly agree, slightly disagree, disagree, and strongly disagree.

4) Ask five experts to examine the content validity, language accuracy, appropriateness, and relevance of the drafted questionnaire. The index of item-objective congruence (IOC) was used to select questions with an IOC of 0.5 and above in order to ascertain the validity of the questionnaire (Turner & Carlson, 2003).

+1 means that the question is consistent with the objective.

0 means that the question is not clearly consistent with the objective.

-1 means that the question is not consistent with the objective.

The formula that was used to calculate the IOC is shown below.

$$\text{IOC} = \frac{\sum \text{R}}{\text{N}}$$

where IOC = Item-objective congruence index

$\sum R$ = Total points from each expert

N = Number of experts

The questions with an IOC of 0.5 - 1.0 were selected, whereas the questions with an IOC of less than 0.5 were rejected or modified according to the experts' opinions

5) Developing the scale construction

The Likert rating scale is a technique for measurement. It is a scale commonly involved in research that employs a questionnaire. Likert scales can measure an individual's rating of their attitudes, feelings, or perceptions related to a series of individual statements or items (Harpe, 2015). Likert developed the scale as a 5-,6- or 7- points ordinal scale used by respondents to rate the degree to which they agree or disagree with a statement (Sullivan & Artino, 2013). This research applies the six-point format that typically provides the following response options rating from strongly agree to strongly disagree.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Slightly Agree
5 = Agree
6 = Strongly Agree

A six-point Likert scale is regarded as a model that is appropriate for measurement when the researcher prefers to reduce the opportunity of choices for answering without considering the items of measurement. Therefore, the respondents cannot choose a moderate value as the middle point in this kind of rating scale (Chomeya, 2010). Thus, the respondents have to choose between one of the two qualifications – agree or disagree.

The interpretation of the score is as follows.

An average score of 3.51- 6.00 means that the determinants are consistent with a high level of innovation management effectiveness.

An average score of 1.00- 3.50 means that the determinants are consistent with a low level of innovation management effectiveness.

6) Try out the modified questionnaire on 30 respondents, who were not the samples of this research, to evaluate the questionnaire's quality and content validity.

3.2.4 Quantitative Data Collection

The primary data were gathered from the questionnaires that were distributed to the 393 members through direct mail and online Internet surveys in a selected department in a public organization, namely: The Department of Fisheries, Ministry of Agriculture and Cooperatives, the Department of Land Transport, Ministry of Transport, and the Department of Medical Sciences, the Ministry of Public Health. The sample was randomly selected in order to evaluate the determinants fostering innovation management effectiveness of awarded organizations in public service innovation.

3.2.5 Quantitative data analysis

Statistical testing is designed in order to test hypotheses and to find the answer to the research questions. In this study, the researcher uses SPSS for Windows as a social science statistical tool. In this research, SPSS was used to analyze the descriptive statistics. Moreover, the researcher conducted a path analysis using the AMOS program.

3.2.5.1 Descriptive Statistics

Descriptive statistics explain the primary method of describing quantitative data and the characteristics of the data set. They help to explore and make a conclusion about the data in order to arrive at a rational decision. Descriptive statistics aim to review the quantitative data set without using probabilistic formulation (Dodge & Commenges, 2006), rather than using data to make inferences about the population.

Moreover, researchers generally present descriptive statistics when the data analysis draws the main conclusion using inferential statistics. Descriptive statistics are used to break the enormous data into a simple form when the research has numerous variables to be measured. Moreover, they provide information about the variability in the data and the estimation in tables and graphs to meet the objectives of the study.

3.2.5.2 Inferential Statistics

Inferential statistics are the primary technique used in this study for inferring the population's characteristics, and they directly relate to hypothesis testing. The inferential tools are represented in the following:

1) Correlation analysis

Correlation analysis aims to find both negative and positive relations between the variables assigned under the research using the correlation coefficient (r). A correlation analysis benefits for the researcher to test and categorize the association between two variables, if the two significance variables have an observed covariance (Shi & Conrad, 2009).

2) Path Analysis

In order to study the influence of the characteristics of the variables according to the assumptions, for this research, path analysis was selected to study the influence of the direct effect and indirect effect among the variables using analysis software with the structural equation modeling method (Kotsemir et al., 2013). The method of estimating the parameters in this model used the maximum likelihood estimator (MLR). Thus, the researcher considered the path coefficients, the standard error of estimate, the coefficients of determination (R^2), and the test of statistical significance of coefficient in characterizing the hypothetical variable's influence**.** Path analysis is robust for examining complex models and comparing different models to determine which one best fits the data (Streiner, 2005). In addition, path analysis provides estimates of the magnitude and significance of the hypothesized causal connections among the sets of variables displayed through the use of path diagrams (Stage, Carter, & Nora, 2004). De vaus (2013) interprets level of path coefficients and the strength of the relationship as shown in the table below.

Table 3.3 Level of Path Coefficients and the Strength of the Relationship

Coefficients	Strength of Relationship
0.00	No Relationship
0.01-0.09	Trivial
0.10-0.29	Low to moderate
0.30-0.49	Moderate to substantial
0.50-0.69	Substantial to very strong
0.70-0.89	Very Strong
0.90	Near Perfect
1.00	Perfect

Source: (De Vaus & de Vaus, 2013)

3.3 The Qualitative Research

3.3.1 Key Informants

The key informants were selected from the employees relevant to the service innovation projects in each awarded organization. The in-depth interviews was used to collect data from the 16 key informants from 3 organizations: 6 key informants from The Department of Fisheries, 5 key informants from the Department of Land Transport, and 5 key informants from the Department of Medical Sciences. The details are shown in Table 3.4. The key informants in the qualitative study.

Table 3.4 The Key Informants in the Qualitative Study

Departments	Key informants
1.Department of Fisheries, Ministry of Agriculture and Cooperatives	1. Head and staff from fish import and export control group 2. Head and staff from the ICT center 3. Staffs from the Fish Inspection and

Departments	Key informants
	Quality Control Division
2. Department of Land Transport, Ministry of Transport	1. Head and staff from Department of Land Transport Bangkok Area 5 2. Staff from the public sector development division 3. Staff from the Department of Motor Vehicles (GPS project)
3. Department of Medical Sciences, Ministry of Public Health	1. Head and Staff from Division of Genomic Medicine and Innovation Support 2. Staff from the National Institute of Health 3.Staff from Medical Sciences Technical Office

3.3.2 Qualitative Research Instruments

The researcher has the procedure for creating the interview form as follows.

1) Study documents to review important issues. The study is based on documents, texts, related research articles, and annual reports to study public service innovation, the characteristics of an innovative organization, the effectiveness of innovation management, and the determinants affecting public service innovation management effectiveness.

2) Study interview formats and techniques that are appropriate for the research.

3) Presenting the interview form to an expert for revising and suggestions.

4) Prepare the interview form and use the interview form to collect information.

3.3.3 Qualitative data collection

An in-depth interview is a primary qualitative data collection method to exchange comprehensive information between the interviewer and interviewee. In the present study, the in-depth interview employed formal and informal in-depth interviews with key informants that the researcher selected from the awarded service innovation organization. The semi-structured interviews were applied to collect data from the purposive selected key informants. The key informants were: the head of the bureau, division, or section and working-level officers in the front office that directly contacted people and officers that work in the back office as front office support. The interviews were done individually in the Thai language, and the duration for interviews was approximately one hour. Conducting the interviews was based on the interview guide.

The researcher prepared the interview information, including introductions to explain the research's purpose, asked permission for a voice recording from the interviewees, and took notes on what the interviewees said in order to enhance the data and to create a rich context for analysis. The interviews were divided into five parts: the interviewee's background information, the importance of creating public service innovation, the characteristic of awarded organizations for public service innovation, and the determinants affecting public service innovation management effectiveness, and recommendations.

In terms of the secondary data, the researcher collects data and information from documents such as government authority's annual reports, OPDC's report, and relevant information that was investigated, including books, journals, official reports, and electronic references.

3.3.4 Qualitative data analysis

In this research, the researcher analyzed data from the in-depth interview according to the following procedures.

1) Organize the collected data, record observations, summarize the data after the interview, and then repeatedly read the transcription and select the critical messages related to the characteristics of the awarded organization and the determinants affecting the fostering of public service innovation.

2) Classify the data according to the research objectives.

3) Identify similar data in order to make a conclusion.

3.4 Operational of Variables and measurement

Operationalization is the process of defining variables to make them more measurable. The researcher has defined the variables and operationalization in order to increase the results' value and to improve the research for design for greater strength, as can be seen the table below.

For describing how the researcher operationalized the variables, the tables below demonstrate the operationalization for each variable. Operationalization of Variables

Table 3.5 Operationalization of Variables

Variables	Definitions	Operationalization	References
Innovative Leadership	- Innovative leadership is leading the organization to achieve common innovation goals, support, and to facilitate employees in the innovation process, delegate employees to initiate and share new ideas and accept different opinions.	-The leader's behavior and styles in managing innovation - Degree of empowerment -Degree of support	- Fullan (2001) - Hornsby et al. (2002) - Soosay(2005) -Shelton and Davila (2005) -Gerzon (2006) -Charan (2008) -Gobillot (2009) -Rahman (2012) -Slimane (2015)
Innovation Strategy	An innovation strategy is an organizational plan aligned with the organization's vision, mission, and objectives to	- Direction for developing innovation in the organization	-Hambrick et al. (2001) -Mintzberg, Ahlstrand, and Lampel (1998)

Variables	Definitions	Operationalization	References
	enable the organization to achieve its innovation goals.	- Innovation strategy implementation	- Barney (2001) - Cooper et al. (2004) -Fruhling and Siau (2007)
Organizational culture	Organizational culture refers to shared values, norms, and beliefs that the organization expects will promote creativity and innovation.	- innovation and creativity as fundamental cultural norms and shared values - Support values such as freedom in the work team and flexibility - Fostering continuous learning, risk-taking, change, competition, and conflict tolerance	-Nybakk and Jenssen(2012) -Martins and Martins (2002) -Schumpeter (2002) - Martins & Terblanche (2003) - Schien (2004) -Loewe& Dominiquini (2006) -Mather (2014)
Organizational structure	- Organizational structure refers to a method that shows divided, organized, and coordinated activities in the organization and controls employee's actions	-Degree of decentralization - Degree of flexibility in structuring the organization - Degree of separate functions or teams to support innovation - The degree of promoting specialization to support innovation	-Mintzberg (1972) -Schine (1988) - Cosh et al. (2012) -Rezayian (2005) - Monavarian et al. (2007) -De Vries et al. (2016)

Variables	Definitions	Operationalization	References
Human Resource Management Practices	Human resource management practice refers to the practice that influences employees' behavior, attitudes, and performance, focusing on recruitment and selection, job design, training and development, performance appraisal, and rewards and recognition.	-Recruitment and selection of the appropriate persons -Training and development of employees to create new knowledge - Job design that enables the employee to achieve innovative competence - Support reward to stimulate employee - Performance evaluation to pursue creative ideas	- Laursen& Foss(2003) - Beugelsdijk (2008) - Chen & Huang (2009) - Martens (2011) - Jiang et al. (2012)
Organization System	The organization's system is defined as the processes and procedures of the organization that support daily activities, including the communication system, resource management, and knowledge management.	- Degree of support in the variety of communication to exchange ideas - Degree of allocating resources - Degree of supporting knowledge management to promote innovation	-Armenakis & Harris (2002) -Kaplan (2005) -Manage (2007) - Choi and Chang (2009) - Berumen et al. (2014)
Innovation Management Effectiveness	Innovation management effectiveness is how the organization and its employees manage innovative activities.	- Organizational innovation management - Potential of employees in innovation management - The competence of public service	- Klein, Conn and Sorra (2001) - Nermien Al-Ali (2003) - Hamel & Getz (2004) -Nieminen (2018) - Jesse (2018)

3.5 Measurement of Reliability and Validity

Reliability and validity are the two most crucial qualities for evaluating measurement instruments, e.g., in-depth interviews and questionnaires. They are used to confirm that the tool can accurately measure and increase transparency for the study (Singh, 2014).

3.5.1 Reliability

Reliability is the instrument's capability to create reproducible measures and shows the consistency the measure (Huck, 2012). Whitley (2012) suggested that the most appropriate reliability measure when the researcher uses the Likert scale is Cronbach's alpha (Whitley Jr & Kite, 2012). The reliability applies to the quantitative method to produce consistency in the measuring instruments (Huck, 2012). It shows the data are consistent or stable, as indicated by the researcher's ability to replicate the findings. Furthermore, a reliable instrument for research will yield similar data from similar respondents over time. In the experimental and survey models of research, this would mean that if a test and then a retest were undertaken within an appropriate time, similar results would be acquired. Cronbach's coefficient alpha can be calculated for the reliability of the questionnaires to measure internal consistency. Cronbach's alpha should be equal to or above 0.70 in order to demonstrate the high reliability and to be acceptable for the study (Tavakol & Dennick, 2011).

3.5.1.1 Pre-testing

The researcher conducted a pretest in order to test the questionnaires' reliability to ensure that the questionnaire was reliable. To be reliable, the questionnaire must had to be answered by respondents the same way each time. Researchers can assess reliability by comparing the answers that the respondents give in one pre-test with answers in another pre-test (Martin, Weisberg, & Saffran, 1989). In this study, the researcher used three government agencies that were excluded from the main study as a pre-test group:

1) Office of the Permanent Secretary, Ministry of Public Health
2) Department of Land, Ministry of Interior
3) Department of Internal Trade, Ministry of commerce

Table 3.6 Reliability Analysis of the Questionnaire

Construct	Conbrach's Alpha Pre-test, N=30	Conbrach's Alpha Post-test, N=350
Innovative leadership (24 Items)	0.853	0.937
Organizational culture (10 Items)	0.821	0.922
Innovation strategy (10 Items)	0.885	0.918
Human resource management practice (18 Items)	0.813	0.941
Organizational system (19 Items)	0.807	0.923
Organizational structure (10 Items)	0.814	0.927
Innovation management effectiveness (7 Items)	0.824	0.916

According to the reliability test results, the pre-test and post-test had Cronbach's alphas ranging between 0.813 and 0.941. According to Hair (2010), high reliability shows that internal consistency exists. Furthermore, the level of Cronbach's alpha estimate of 0.70 or higher shows good reliability (Hair, 2010). In this research, all of the constructs were highly reliable because the Cronbach's alpha scores were higher than 0.8, which means that the questionnaire has high reliability.

3.8.2 Validity

Validity is an instrument used in an experiment to measure precisely what it is intended to measure (Hair, 2010). If the experiment is valid, it means that there is no error in the measurement. Moreover, it shows that the experiment is performed with all of the researcher's variables because the researcher covered enough of the subject that they are testing, and the findings correlate with the hypothesis (Amin, 2005). The quantitative study's validity refers to the measure that is intended to be measured, and validity shows how well the data collected covers the actual area of investigation

Field (2013). Validity in quantitative research often concerns objectivity, generalizability, replicability, predictability, and controllability.

In this research, the indexes of item-objective congruence (IOC) are applied for evaluating content validity at the item development stage. An evaluation using the index of item-objective congruence is a process by which content experts rate individual items based on the degree to which they measure specific objectives. The experts evaluate each item by rating 1 for clearly measuring, -1 for not clearly measuring, and 0 for unclear content Turner and Carlson (2003). In this research, the index of item-objective congruence was used to select the questions with an IOC of 0.5 and above in order to confirm the questionnaire's validity. On the other hand, the questions with an IOC of less than 0.5 were rejected or modified.

CHAPTER 4

DATA ANALYSIS AND RESEARCH RESULTS

Regarding the research results concerning the determinants of fostering innovation effectiveness in Thai public services, the author used quantitative and qualitative methods. The quantitative data were collected from the government officials from the awarded organizations. The qualitative data were obtained from the head of the office, bureau, division, or section and working-level officers. This chapter will present the research findings and begins with the results of the qualitative research obtained from the semi-structured in-depth interviews. The second part of the chapter presents the characteristics of the respondents and the results regarding the determinants in fostering innovation effectiveness.

4.1 Results of the Qualitative Research

The researcher selected key informants from three departments: the Department of Fisheries, The Department of Medical Sciences, and The Department of Land Transport. The in-depth interviews were conducted to collect data about the determinants fostering public service innovation from 16 key informants from the head of the division, head of the projects team, and staff in order to compare and confirm the accuracy and to check the completeness of the data. The qualitative results are as follows.

4.1.1 The Importance of Creating Public Service Innovation

According to the research results, it was found that the government agencies recognize the importance of bringing innovation to the development of services in their department. Innovation will facilitate serving people and reduce the problem and limitations of inadequate staff. Furthermore, innovation development can enhance trust and change people's perceptions of receiving public sector services.

4.1.1.1 Definition of public service innovation

Most of the key informants similarity stated that public service innovation has the definition of creating new things or improving and developing existing things through invention and experimentation until it is reliable and effective in practice. The goal of creating innovation is to create new, quality, efficient products and services. Moreover, people are easily accessible and compliant with their needs. The results regarding the definition of public service innovation are shown in table 4.1

Table 4.1 The Definition of Public Service Innovation from the Perspective of Key Informants

Topic	Results
Definition	- Ideas for improving better products and services - Converting creative ideas into desired outputs -The act for introducing a new idea to improve the quality of services and products -New ideas, methods, and formats in organizational development, the work process, and service delivery result from knowledge application -The creation of new or improved knowledge and the transfer of ideas to new products -Practical ideas or new inventions to help the organization work effectively and efficiently -Doing things differently from others through change becomes an opportunity and transmits new ideas to benefit the organization and society -The introduction of something new to facilitate the work process and services -Adopting new methods that start from invention and development and then are put into practice -New ways of solving problems in services

Topic	Results
Definition	-New things arise from knowledge, skills, experience, and creativity that may appear as a new product, new service, or new process.

4.1.1.2 The importance of public service innovation

The key informants mostly believed that public service innovation is important for the public sector because service innovation allows organizations to use knowledge and information to develop, improve, and create value for better products and services. In terms of internal management, innovation enables the work process to be fast, modern, economic, and reduces workforce constraints. Moreover, the key informants stated that public service innovation shows the organization's efficiency in delivering services to new social demands. Public service innovation can enhance trust and change people's perceptions of receiving public sector services. The details are shown in Table 4.2.

Table 4.2 Results Concerning the Importance of Public Service Innovation

Topic	Results
Importance of public service innovation	-Reduce the problem of professional personnel shortage. -Serving the people faster and more thoroughly. - It can respond to new social demand. - Increasing efficiency for delivering new and better quality services. - The organization has continuous improvement. - Improving the quality of services and reducing the workload of staff. - The organization has innovative products (goods and services). - Organization has the ability to better cope with changing environments. - Public service innovation enhances trust and improve the image of the public sector.

4.1.1.3 The importance of receiving a public service innovation award for the organization

The key informants illustrated that receiving an award from the OPDC makes the employees proud because rewards show their dedication to work to achieve success. Moreover, in order to achieve the award, the organization must pass many evaluation criteria and deal with competitors. Therefore, receiving awards shows that the organization has the ability to develop service innovation and that the organization has an outstanding performance. In addition, receiving the award will motivate government officials to improve service innovation continually. The details are shown in table 4.3.

Table 4.3 Results Concerning the Importance of Receiving the Public Service Innovation Award

Topic	Results
Importance of public service innovation	- Receiving awards shows that our work has been successful. - The organization can continuously improve services for people. - It is encouraging to develop innovations to serve the people. - It is a valuable reward because it goes through multiple stages of evaluation. - The award shows the competence of the staff in the organization. - The organization has the potential to develop innovation. - The staff is proud of its contributions to success. - It shows the commitment and dedication of the government officials at all levels of the organization and shows cooperation in developing innovation to achieve organizational excellence. - Motivation for continuously innovating and developing their work.

4.1.1.4 Problems in establishing public service innovation

There were four issues regarding public service innovation in the present study. First, the problem involved with the internal management system, especially in technology, is that it is evolving quickly, becoming obsolete within a

few years. Moreover, innovation development requires continuous development of personnel and systems, which requires a high budget to achieve continuous development. However, the government budget is limited, and it is difficult for personnel to achieve continuous development. Second, the external factor is problems arising from users with different usability and accessibility technologies, especially in terms of innovative services in the online platform. Thus, the agency must have a guideline to provide sufficient information to understand the users. Third, laws are a significant obstacle because the department's innovations have to amend the law to enforce that innovation; this is time-consuming and does not guarantee that the law will be amended. Therefore, the innovations that have been developed may become obsolete when the law is approved. Finally, implementing innovative ideas for some departments, such as the department of medical sciences, requires knowledge of patents in order to protect the invention and to commercialize knowledge for disseminating that service to the public. Further details are shown in table 4.4.

Table 4.4 Results Concerning Problems in Establishing Public Service Innovation

Topic	Results
Problems of public service innovation	-Innovative proposals relate to laws whose amendments are time-consuming, so the proposed innovations may be outdated, and innovation cannot be implemented. -The organization lacks business knowledge because the products must be patented and marketed. - The organization must continually update technology because new technology can become obsolete quickly. - Developing a collaborative system is also tricky because switching to the same system requires changing the server, which is costly, so each agency wants to develop its system. - The development of technology needs a huge budget. - Users are used to traditional services, and some users cannot access the online system.

Topic	Results
Problems of public service innovation	- Spending money on continuous service innovation can be difficult because the organization has many missions to perform, and the budget is limited. - Each generation has different abilities and understanding of innovative projects. -Users do not understand how to use the system, so the agency must have manuals and channels to help them, such as call centers.

4.1.2 The Characteristics of Awarded Organizations in Public Service Innovation

4.1.2.1 The Department of Fisheries

Organizational innovation management

The key informants expressed that The Department of Fisheries attaches great importance to continuous innovation development. This can be seen from one of the organization's missions "Promoting and encouraging study and research on all areas of fisheries, developing and transferring new fisheries technologies building upon research for the creative and value-added innovation" (The Ministry of Fisheries, 2017). In addition, the organization also defines innovation as one of its strategies; therefore, the organization has many innovative projects. For example, a fish product traceability system can trace the product back to the aquatic animal's source and ensure that no IUU fishing (Illegal, Unreported, and Unregulated Fishing) is taking place and that there is exportation to another country. The project uses an electronic system to control and monitor the fish caught from the Thai fishing vessels imported from abroad, linking the information systems of many relevant agencies. This project got the public service PSEA award from the OPDC and stop IUU fishing award from International MCS Network.

The key informants indicated that the organization sets the innovation strategy to achieve innovative performance. The strategy enables employees to understand the organization's overall needs and current innovation management capabilities,

enabling employees to operate and use resources effectively in order to manage innovation. Thus, innovation is included in the annual operational plan, especially in integrated research and innovation programs with qualitative and quantitative indicators that focus on improving and developing innovative performance. For example, there are 18 innovation projects in the fishing industry to promote research and development to strengthen the fishery industry and increase competitiveness, and two projects that focus on basic infrastructure development to support research and innovation in fisheries. Thus, this shows that the Department of Fisheries has a roadmap for continuous innovation development.

The key informants also confirmed that the director-general plays a vital role in the innovation management process in fostering, supporting, and directing innovation management in order to achieve the organization's goals. The leader is the pioneer in creating innovation in the organization because the leader believes that innovation helps service and reduces the staff's burden collecting information. Furthermore, the leader is keen on innovation opportunities, encourages innovative behavior, and motivates through a shared vision and strategic plan.

> "The leader focuses on research and development of innovation and technology, which can be seen from the strategic formulation related to enhancing the capacity of standardized aquaculture production, enhancing fishery product processing, aquaculture resource management, sustainable and smart fisheries."

Moreover, the leader supports the team and provides critical resources and tools to implement innovation and ensure that each project has sufficient resources. For example, the organization supports equipment that links with a traceability system for fish quarantine and inspection in each port state to inspect the import and export of aquatic animals. The leader, therefore, pushes in every work process, where it can be seen that the department has new innovations almost every year. Therefore, the leader is part of the organization's innovation management, both as a policy provider, supporter, and driver for continuous innovation development.

Potential of employees in innovation management

The key informants describe that the organization continuously supports and motivates employees, whether providing knowledge or supporting resources that help innovative projects be successful. In terms of support, the organization supports training courses within and outside the organization related to innovation in order to develop knowledge and abilities. In addition, the organization has partnerships with external agencies to exchange knowledge and experience and to acquire new knowledge of aquatic animals.

> "The Department has MOU with NSTDA by the joint implementation of research, development, and innovation in aquaculture and to exchange knowledge and experience to develop the greater potential of the employees."

The key informants emphasize that the department recognizes the importance of developing innovative employee knowledge both central and regional. For example, the department supports the provincial fisheries office to collaborate with universities to develop research and innovation and to develop the provincial the Department of Fisheries personnel to increase knowledge and experience.

In addition, the Department of Fisheries has a vital strength of being competent and committed to employees to accomplish their assigned duties. One key informant stated the following:

> "Employees in the organization are the strength that is an integral part of the Department of Fisheries to succeed in innovative development because they are ready to move on to organizational goals, even if the assignments are difficult and challenging."

The award is a testament from the OPDC that illustrates the efforts and cooperation of the people in the organization to improve collaboration that continues to lead the organization to success.

The competence of public service

The Department of Fisheries' service innovation is designed to enhance public satisfaction with services and inspections. Most of the service innovations use technology to provide convenient, fast, and accessible services. However, offering new service innovation to the public is not an easy task. The key informants expressed that people refused and wanted to return to the old method because they thought that learning new technology was not easy. Nevertheless, when people became familiar with the system, they began to pay more attention because they felt that it was convenient and fast and it was not necessary to fill out as much paperwork as in the past. Further, receiving feedback from users (people) contributes to the development of service innovation with better continuous improvement. One key informant indicated that the recipient's satisfaction and benefits were more valuable than the organization receiving an award. Therefore, the ultimate goal of innovation development is not a reward but for the people to have a better quality of life from better services.

In addition, the organization has a process to promote and drive innovation projects for awarded submission by setting innovation as one of the annual work plans. Thus, the organization has many ongoing innovation development projects and can select those works for being submitted to a contest. The organization has a committee for considering the innovation projects in order to select the most outstanding ones to submit to the contest, such as the PSEA awards, as indicated in the following statement:

> "Awards show that the department's project has quality and recognition, and it can motivate employees because they achieve success through their hard work."

The award will cause the motivation of employees to develop innovative projects continuously because the national agency accepts the innovative projects in terms of the quality and benefits of the implementation.

An example of awarded innovation is the Thai flagged catch certification system is designed to control fishing vessels' entry and exit. The system will link and verify critical information, efficiently help people, and establish standards for controlling illegal fishing. This system greatly increases the transparency and accountability within the fish product chain of custody. This system is an important type of innovation that significantly increases the capacity and capability of the department to control fish and fish products throughout fish product flows. The most important aspect of this system is the support provided through the information exchange involving all stakeholders.

Electronic commercial fishing control using the fishing info system is one of the awarded innovations designed to collect fishing boat information, fishing license, fishermen data, and foreign workers information. This system integrates the problem-solving of illegal fishing from seven organizations: the Royal Thai Navy, the Marine Police Department, the Marine Department, the Department of Fisheries, the Department of Provincial, and the Department of Labour Protection and Welfare. The officers from all seven departments can retrieve real-time information while inspecting fishing vessels. In addition, the system can determine the data needed for operational control, monitoring, a preventive deterrent to illegal fishing quickly and effectively covers the information needed. For example, vessel registration information, boat size, engine size, boat owner and boat photography, annual boat license information, and vessel monitoring system (VMS).

4.1.2.2 The Department of Land Transport

Organizational innovation management

The Department of Land Transport has continuously developed public services, even though service is not the department's core mission. The organization develops innovation to facilitate and supervise the transportation of land thoroughly. The key

informants described that effective innovation management is from the department's director-general, who recognizes the importance of adopting innovation.

The leader has the vision to understand, foresee, and determine future directions correctly. Moreover, the leader also understands changes in terms of anticipating, accepting, and managing them. The "Drive-thru for tax" is one of the service innovations created from the Director-General's idea of drive-thru restaurants. Then the leader led the team to develop further ideas that will lead to improvements in the service innovation project "Drive-thru for tax," which now distributes services to provincial land transportation offices. It facilitates and shortens the time that people contact government agencies. In addition, this service has also received PSEA awards from the OPDC. The leader also empowers employees to think and experiment, which includes both successful and unsuccessful projects. For the unsuccessful projects, the leader suggests that employees try and find different ways to make them practical.

The Department of Land Transport improves work processes to support innovation organization by integrating work to reduce the steps and time in the work process and focuses on performance-based management with precise and reliable indicators. Moreover, the organization applies innovation and technology to develop land transport systems in governance, the control of safety standards, service provision, and infrastructure development. The organization also promotes research and development to apply innovation and smart technologies in creating digital services that can respond to social change and maximize the benefits to the public. The development of innovative management will promote the organization to have high performance as a mechanism in managing the country to be trusted by the public and to compete at the international level.

In addition, the key informants mostly stated that the department encourages employees to recognize and participate in innovation development through strategies because this is crucial for fostering organizational innovation. After all, a strategy is a way to achieve an organization's goals by defining innovation development guidelines. The Department of Land Transport has set innovations in its strategic map to create innovative transportation and to create excellent services. Thus, innovation is addressed in every strategy issue. For example, the organization

has the strategy “develop innovations for controlling, supervising all types of public transport to meet the standards, comply with the people's travel needs, and prevent illegal vehicles” which is consistent with the strategy issue in developing and promote an efficient road transport system. The key informants also emphasize that having a strategy related to innovation will help promote and support the organization’s management in order to generate new ideas and allocate innovation resources. In addition, the strategies that focus on innovation will result in employees having innovative thinking.

Potential of employees in innovation management

The key informants stated that the employees recognize innovation as a shared value. The innovation is stated in the vision “To be the innovative organization in regulating, supervising, and to promote quality and safety of road transport system” and the mission “Improve innovation control system for road transport and law enforcement” (The Department of Land Transport, 2016). Thus, everyone dares to experiment and invent innovative projects in order to make changes for the better. The organization also creates a teamwork culture to support innovation development by creating a cross-functional team by recruiting skilled employees from different departments, creating team collaboration and unity in driving innovation.

> “The cross-functional team benefits innovation projects because it explores a wide range of ideas, breaks down knowledge barriers between functional departments, and facilitates the innovation process.”

Another distinctive characteristic of the department is that employees of different generations can work well together and adapt to other colleagues. As a result, the employees can perform very well in both routine jobs and innovative projects. The key informants mentioned that the collaboration between different

generations is one of the aspects of the strong culture of the department that can foster innovation in the organization.

> "To succeed in implementing innovation in the organizations is not just open-minded executives but those who work together are open to each other's opinions, that what is our department has."

The key informants described that knowledge management is an important attribute that promotes innovation management effectiveness. Therefore, the organization has a knowledge management process for innovation to create exchange of knowledge in the organization by promoting and encouraging learning and providing a channel for exchanging and sharing employees' knowledge, such as journals, infographics, and video clips. Furthermore, the Department organizes activities to exchange experiences between functions in order to allow employees to exchange knowledge, work, and to develop innovations to meet the people's needs.

> "The organization supports and encourages employees to continuously develop their knowledge and abilities because it recognizes the personnel as the best key in developing innovation successfully."

Furthermore, the department is committed to being a high-performance organization (HPO Center) using technology and innovation for the greatest benefit. In other words, the department wants to shift from being a service-oriented public sector to an innovative organization with excellent performance. To be an HPO or innovative organization, the organization must have employees with competencies consistent with its vision, especially in terms of knowledge, professionalism, and various skills. Thus, the organization enhances capability building in terms of expertise and skills consistent with changing contexts by supporting training and development, such as on-

the-job training, off-the-job training, e-learning, and self-learning. Furthermore, the organization has the policy to promote talented employees to enter the HIPPS system in order to boost employee morale, encourage employees to learn new challenging tasks, and have the opportunity to receive special salary promotions.

The competence of public service

The department has identified innovation development as part of the action plan; thus, it has a continuous innovation program whose primary goal is not to submit to a contest but to improve work efficiency, to serve people, and to comply with Thailand 4.0. The key informants indicate that the department seeks to continually raise service standards by establishing an operational plan and organizational direction in order to become an innovative organization regulating road transport systems for quality and safety. Thus, the department adopts technology in order to improve and develop its services by launching the DLT application to help people uses the services. The department has developed three outstanding service innovation projects. First, the Global Positioning System (GPS) solves road traffic accident problems using the GPS data information, which will be sent to the GPS transportation management center. The system will detect which vehicles are speeding or drivers that have expired or wrong driving licenses or are over their permitted hours. The management of this project will operate using 360-degree participative management for all related parties and the public. This project will also provide a mobile application called “DLT GPS” to check drivers' information, the speed of vehicles, and feedback. Second is the inspection online and supervising with the vehicle inspection control center with using CCTV. The Land Transport Office can take advantage of information technology in order to control and supervise the vehicle inspection control center. It also links all vehicle inspection results through an information system with a registration and tax system. Moreover, people can inspect the vehicle via the website immediately. Third, the Drive-thru for tax aims to improve the quality of services and increase the efficiency of operations to meet the needs of the people in terms of renewing their vehicle registration through a drive-thru for tax. It also reduces the processes and improves performance, and provides a worthwhile benefit to the public.

The innovation project also comes from provincial administrations such as Application Rayong School Bus Driver for Road Safety and Robot Ai-vehicle Inspection Tak. Moreover, these two projects have received an award from the OPDC. This shows that innovation development has achieved results throughout the organization because of participation from all parts of the organization. The employees found that their innovation project is practical, and people are satisfied. They are motivated to develop continuously; thus, the department has continuously received the award for the 18thyear. The key informants stated that improving the services by introducing innovation is changing the department's obsolete image into a more modern organization, as indicated in the following statement:

> "It is undeniable that the development of the service innovation has caused the Department to change the better work image to become a more modern organization."

4.1.2.3 The Department of Medical Sciences

Organizational innovation management

The Department of Medical Sciences is an agency that focuses on research and development by supporting scientific research analysis to protect people and consumers. Moreover, the department also focuses on research and develops innovations that will benefit public health. Innovation is defined in the mission: "To study and conduct research and development for knowledge, technology, and innovation in the areas of medical sciences and public health" (The Department of Medical Sciences, 2019). The department strengthens the organization's capacity to enhance management by applying innovative management practices and modern information technology. It empowers the organization to raise the level of knowledge, research, development, and innovation in line with the needs of the people and the country. People and related agencies benefit from the research and innovation in medical science used to prevent and mitigate health problems, industrial promotion, and the production potential of the agricultural sector.

The key informants stated that the Director-General's goal is to develop the organization into an innovative one and to encourage innovative projects

to be advanced more than R&D, which can be patented and lead to successful commercialization. Thus, the organization has a strategic plan which specifies the indicators of innovative projects, measured by the number of innovations or health technologies that have been invented or developed. Moreover, the indicators are related to performance appraisals, so employees must have their work results viewed annually, and the work results must be published to disseminate knowledge to the public. Identifying innovation is one of the strategic plans that help innovation keep pace with changing environmental conditions. It also helps the organization have a clear target direction, which will affect the operations and activities that have been invented, and applied according to the changing environment.

The department realizes the importance of knowledge management to elevating the organization to be a high-performance organization (HPO Center). Thus, the organization creates a culture to promote innovation by creating an atmosphere for employees at all levels within the organization to think "outside the box," experiment with new things, and constantly learn to make changes that benefit the organization. There are three methods for achieving these goals. First is to, establish a medical science practitioner community to exchange knowledge through the practitioner community. The community establishes and registers the community of practitioners officially according to the roles and missions of the department of 13 communities, such as lab safety, food safety, and the quality and safety of drugs and biologics, as discussed in the following:

> "Sharing knowledge can help employees expand their creativity to improve the innovation process quicker access and transfer of new knowledge."

In addition, sharing problems arising from work leads to inventing and solving problems for creating innovative services for the people. Second, "Springboard Storytelling" is a competition activity in professional storytelling to encourage inspiration in work. It is a technique to convey ideas about great success

that has been achieved. The finalists will compete for the championship on a KM Day. Third, developing an information system in knowledge management by developing a website as a channel for employee access to knowledge is more convenient by analyzing and storing information online, such as publications, manuals, and guidelines to enhance the employee's knowledge. In addition, the department communicates and disseminates knowledge to the public through various channels such as YouTube, green book online, and e-library.

Potential of employees in innovation management

The department has employees with knowledge, expertise, and high potential to research and to create knowledge, inventions, and innovations that can be applied to benefit the country's public health system. The employees realize the importance of adapting to change and to be committed to continuous development, especially in research and development. The distinctive characteristics of employees are expertise, skills, and aptitude. The organization identifies employees' skills and encourages them to provide training as needed in order to increase the efficiency of the employees, which will directly affect the organization's performance. Training and development are the processes that the organization continuously supports. All employees have an individual development plan that requires personal development in their areas, for example, business acumen (service delivery, health workforce, information, financing, medical products, vaccines and technologies, and governance) and general management (customer experience and project management). Moreover, the organization has a mentorship system of innovation to consult and supervise regarding the development of innovation. The organization has training specifically in innovation for researchers once a month. The organization also offers scholarships for employees who wish to study for a master’s or a doctoral degree to develop the employees' potential.

The department emphasizes “team work” both within the department and outside the department in order to implement projects and activities that are successful and sustainable. Teamwork maximizes shared knowledge in the workplace

and helps individuals learn new skills, and creativity thrives when people work together on a team. Furthermore, the key informants stated that the department has also partnered with other public and private organizations to develop innovative work. In this way, employees can exchange knowledge and have more work experience. For example, the department has a partnership with medical technology control in developing innovative healthcare, cooperation in research and the development of knowledge, invention, and innovation laboratory medical, and organizes training and development courses such as developing short-term courses on precision medicine. Moreover, the department also collaborates with PTT and Vistec in order to research a highly effective COVID-19 test kit by developing an easy-to-use design to shorten the diagnosis time with at a low cost and that is easy for people to access.

The competence of public service

The department focuses on the analysis, research, and development of knowledge and technology in medical science to promote good health for the people, to support solving the public health problems of the country, and to support consumer protection. The department also provides consumer protection and supports the country's competitiveness by developing laboratory capabilities such as developing the ability to analyze pesticides in fruits and vegetables. The department has also implemented government policy of Thailand 4.0 in bringing herbs to add value by making it possible to prevent mosquito bites and other insects. The key informants stated that the department promotes and coordinates the transfer of innovation and knowledge of the department to other organizations ready for technology transfer and commercial development. Furthermore, the department has a partnership with the private sector for the technology transfer of commercial products and bring this innovation for registration for Thailand innovation.

The “RepelMos project” is an innovation that has been developed to help tackle mosquito-borne cigar infection and disease that is available to all people. This product has resulted from the continuous creation of innovative work resulting in the department having submissions to compete and receive awards from the OPDC. The “MOSDOP TB” is another service innovation funded by the Ministry of Higher Education, Science, Research and Innovation (MHESI), and the department has

collaborated with a private organization (Project Field Co., LTD) to develop innovative products to eliminate mosquito bites larvae. The results of the studies on the efficacy of this product have been published in international journals such as the "Southeast Asian Journal of Tropical Medicine and Public Health." The product was also registered by the Food and Drug Administration and won the public service innovation award from the OPDC, as discussed in the following;

> "The key success is the public sector provides academic support until it can be developed into a commercial product that can distribute and increase opportunities for people to control and eliminate mosquito larvae themselves effectively."

The number of innovations and health technologies that are newly invented and developed is one of the indicators of the department, causing the department to innovate continuously. These innovations, which are driven to serve the people, primarily benefit public health.

In summary, the qualitative result of the characteristics of the awarded organizations shows that the awarded organization have both similarities and differences in characteristics as follow.

1) Organizational innovation management: The awarded organizations have visionary leadership in fostering innovation development and stimulate team creativity. The organizations also focus on innovation strategy to achieve innovation performance. Moreover, supporting research and development encourages employees to develop innovations continually. The awarded organization attaches great importance to supporting continuous innovation management to deliver new service innovations continually. However, The Department of Land Transport and The Department of Medical Sciences build an innovation culture to show that innovation is primarily intended to improve the organizational potential. In addition, both

organizations apply smart technology to products and services to develop modern services.

2) Potential of employees in innovation management: The awarded organizations emphasize developing employees to have the potential to support innovation development by supporting both in-house and external training in order to develop the skills, knowledge, and capabilities of employees. Furthermore, the organization supports a knowledge management system (Beckmann et al.) to capture and use knowledge to improve organizational performance and innovation development capabilities. The organizations also support teamwork to empower employees to take action and decide in the innovation process. Consequently, employees have active participation and encourage creativity. Nevertheless, The Department of Fisheries and The Department of Medical Sciences collaborate with external organizations such as universities and the private sector to exchange knowledge and experience in innovation development. The Department of Land Transport is different from other organizations in encouraging employees to learn a new challenging task by promoting talented employees entering the HIPPS system. In addition, The Department of Medical Sciences is outstanding in developing employees to accommodate innovation projects by support a mentorship system for innovation development and provide a system for developing talented employees.

3) Public service competence: The awarded organizations have a similar method to create competence in public service by applying technology in the service innovation to improve efficiency and provide convenient and accessible services. The Department of Fisheries is outstanding in driving the innovation projects for awarded submission every year. Nevertheless, The Department of Land Transport differs from those two organizations in supporting innovation projects from central and provincial administrations, such as the Robot Ai-Vehicle Inspection Tak project. The Department of Medical Sciences is outstanding in strengthening public service competence by having technology transfer from the private sector as a result of the cooperation in innovation development. Moreover, The Department of Medical Sciences has funding from the partner organization for research and development. The

difference from other organizations is that the innovative products of the department can commercialize and patent.

The summary of the characteristics of the awarded organizations is shown in table 4.5

Table 4.5 Summary of the Characteristics of the Awarded Organizations

The characteristics of the awarded organization	**The Department of Fisheries**	**The Department of Land Transport**	**The Department of Medical Sciences**
Organizational innovation management	- Visionary leadership in innovation management - Set the innovation strategy - Support R&D - Support the continuous innovation management	- Visionary leadership in innovation management - Set the innovation strategy - Support R&D - Building an Innovation culture - Apply smart technology to creating digital services -Improve work process to support innovation management	- Visionary leadership in innovation management - Set the innovation strategy - Support R&D - Building an Innovation culture -Apply innovative management practices and modern information technology to strengthen organization capacity - Support the continuous innovation management
Potential of employees in innovation management	- Support in-house training and external training	- Support in-house training and external training	- Support in-house training and external training

The characteristics of the awarded organization	The Department of Fisheries	The Department of Land Transport	The Department of Medical Sciences
	- Support Knowledge management system	- Support Knowledge management system	-Support Knowledge management system
	-Innovation team building	- Innovation team building	- Innovation team building
	- Collaboration with the external organization	-Promote talented employees to enter the HIPPS system	- Collaboration with the external organization - Has a mentorship system for innovation development - Has a system for developing talented employees
The competence of public service	- Apply technology in the service innovation	- Apply technology in the service innovation	- Apply technology in the service innovation
	- The service innovation provides the convenient, fast and accessible	- The service innovation improve work efficiency and quality of services	- The service innovation promote good health and support solving public health problems
	-Has process to drive the innovation projects for awarded submission	- Innovation projects come from both central and provincial administration	- Has technology transfer from the private sector - Has funding and academic support from other

The characteristics of the awarded organization	The Department of Fisheries	The Department of Land Transport	The Department of Medical Sciences
			agencies -Innovation products can commercialize and patent
The example of service innovation	- Thai Flag Catch Certification System - Electronic commercial fishing control using the Fishing Info system	- Drive-thru for tax - Robot Ai-Vehicle Inspection Tak - DLT Application - Inspection online and supervise vehicle inspection control center with CCTV	- Leo-Trap - RepelMos - Tuberculosis genetic transcription system across the Thai genome - MOSDOP TB

4.1.3 The Determinants Fostering Public Service Innovation

According to the research results, innovative leadership, human resource management, innovation strategy, organizational culture, organizational structure, and organizational systems are the actors that foster public service innovation. The information is shown below.

4.1.3.1 The role of innovative leadership in fostering innovation

Leaders are recognized as an important factor in promoting innovation in an organization because the leader has a vision, is knowledgeable, accepts opinions, is open-minded, and recognizes the importance of innovation. The research results indicated that the leader is significant in fostering innovation in the organization. When the leader has a clear vision and direction, the employees can perform well in their assignments. The key informants mostly stated that leaders at every level show

the ability to be forward-looking, focus on the future, adapt to change, and have a visionary approach, which is a critical factor in promoting innovation guidelines for implementing innovation. The key informants provided further information as follows:

> "The leader has a clear policy of shifting their operating practices from manual to electronics, so people in the department must adjust their work according to the leadership's direction."

> "Leaders at all levels contribute to successful innovation strategies in both communication and supervision, resulting in the awareness of employees being active in innovation work."

> "The organization continues to develop service innovation because the leader has a vision of innovation, understands the situation, and can anticipate change."

In addition, the perceived personality of a leader is to take risks based on the feasibility analysis to reduce errors that occur from work. The innovative leader should believe in change as a basis for the leader to manage uncertainty issues and risk-taking at an acceptable level of the public sector. On the other hand, when a mistake occurs, the leader must accept and develop a better innovation project and identify what not to do again, as seen in the following statements:

> "It is also necessary to take risks based on the possibilities in order to reduce the mistakes made in making decisions."

"Innovation is about making new discoveries, so leaders must be the ones who take the risk of doing new things based on available information."

"Leaders look at the feasibility of each project that subordinates present, analyzing opportunities, assessing the potential impact of innovation, and approve the project if it is considered that the innovation has a chance of success and the people benefit."

Support is another characteristic of innovative leadership. An advocate's role is crucial to supporting the resources required to perform innovation projects, such as budget, personnel, and the necessary equipment to support innovation. The key informants indicated that each department's Director-General supports and promotes service innovation, such as research funding, and cooperation in innovation activities with other public organizations or private organizations. The key informants provided further information as follows:

"The leader places great importance on innovation development, such as encouraging in-house innovation contests, where leaders always give prizes themselves, which encourages executives at all levels to recognize the importance of innovation and help create shared values in creating innovation."

"Leaders must place great emphasis on supporting the resources that are needed for innovation, such as budget and equipment required to work."

An open-minded leader is another crucial factor in creating a successful innovation. It shows the leader's openness to new ideas and suggestions by others. Leaders who that are open to ideas and feedback tend to be more trusted by their employees and show that they are ready to learn together with employees without sticking to traditional working ideas. Moreover, leaders must also be open-minded and accepting of all opinions.

> "The leader does not think he is the best. Therefore, when developing innovations to solve problems in work such as the development of a COVID-19 Strip Test, leaders would call experts from each relevant department to provide information to ask for their opinions and to provide suggestions to all areas."

> "The leader keeps track of innovation development and ensure each department works according to the specified criteria. If unable to do so, there will be a call to discuss the problem with suggestions for solutions."

It can be seen that the role of leaders fostering innovation is visionary leadership, being capable of anticipating change and encouraging employees to recognize the importance of change by creating innovation to support work routines. The leader must also be open-minded in order to see other's viewpoints and to evaluate whether they work or not. The open-minded leader shows acceptance and respect for other's beliefs and opinions. Moreover, the leader shows strong advocacy because innovation can be driven if leaders provide good and sufficient support.

4.1.3.2 The role of innovation strategy in fostering public service innovation

Many organizations emphasize strategy in fostering innovation. A strategy is the central system that offers the basis of every operation that an

organization undertakes. A strategy also enables employees to understand the organization's overall needs and current innovation management capabilities, enabling staff to operate and use resources effectively to manage innovation. In addition, strategy formulation provides administrators and staff readiness to understand the organization's potential and to influence organizational factors. The key informants indicated that government agencies pay great attention to strategy formulation involving innovation. This can be seen from the vision and mission of each organization that focuses on innovation. For example, the Department of Land Transport wrote a vision statement that included the following: "to be the innovative organization in regulating, supervising, and promoting quality and safety of road transport system". Alternatively, the Department of Fisheries wrote a mission statement related to innovation as follows: "…developing and transferring new fisheries technologies building upon research for the creative and value-added innovation". Moreover, these departments formulate the innovation strategies to show the directions or plans of action to achieve innovation goals. Thus, it shows that each department's focus on innovation is the primary goal of the organization, as seen in the following statements:

> "The strategy related to innovation of the Department of Land Transport is in the fourth strategy to enhance the organization's high performance and manage it according to good governance, which is an indicator of the level of success in innovation development throughout the organization."

> "Innovation is the Department of Medical Sciences' strategy to create excellence in research and innovation development because the department's primary mission is to be the reference laboratory of the country."

The organization also evaluates the results of implementing the strategic plan to collect information about how well the strategic plan is progressing and to

determine the innovation strategy's effectiveness in achieving the organizational objectives. The key informants provided further information, as seen below:

> " The Department of Fisheries will have a unit that oversees the implementation of the strategic plan to see how each segment is operating, which is the internal control of the organization."

> "The Department of Fisheries maintains a clear strategic process from strategy formulation to the monitoring of strategy implementation."

It can be seen that the organization gives importance to innovation by developing an innovation strategy and by transferring strategies to the individual level. The employees will understand and comply with the organization's direction because strategies provide clarity in innovative work. Strategies are passed on to different departments, enabling everyone to perceive, understand, and work in the same direction. Furthermore, the organization also has a system for monitoring and evaluating innovative performance according to the strategic plan in order to ensure that the implementation that follows the organization's strategy meets the organization's objective.

4.1.3.3 The transmission of organizational culture in fostering public service innovation

The organizational culture encourages employees to create new ideas. It fosters an organization with a culture of exchanging ideas and knowledge, creating a learning culture across the organization, and contributing to knowledge creation and innovative organization. Most of the key informants stated that the organizational culture can make work more creative and innovative; thus, they believe that the organizational culture is essential in developing innovation. They described that the

culture is transmitted through the vision, mission, values, and strategic plans. Thus, employees perceive innovation as a shared value, and then they will have work behaviors consistent with innovative approaches.

Furthermore, it is necessary to create an environment to support employees' active participation in the innovation process and to accept mistakes and risks associated with them. The sufficiently influential culture can impact how people think and create creative ideas. Some key informants stated that an innovative culture can be transmitted from informal meetings; for example, the organization can organize a coffee meeting by inviting another team project that uses the same technology to meet, discuss and exchange ideas. Key informants provided further information as follows:

> "The organization transmits innovation culture through an organizational vision for everyone in the organization to recognize and understand, thus making innovation development a priority."

> "The culture associated with innovation that the organization transmits to the people in the organization has the same goal of desire to develop innovation in service for the better, and people in the organization are dedicated to doing that work successfully."

> "Everyone in the organization perceives innovation as the organization's core mission because innovation is stated in performance. Therefore, research work to improve the service provider must be continued."

> "The Department of Land Transport culture is the service passed down from one generation to the next, allowing the new

generation to absorb the work of the previous generation. Service-mindedness is another important factor that makes the department officials want to develop innovation in order to serve people better and faster."

"The organization provides a learning exchange platform for groups of people using the same technology to meet and discuss, which promotes the introduction of new ideas."

For innovation to be carried out continuously, it must begin cultivating a culture of creativity within the organization. Organizational culture is essential for changing people's thinking and values towards innovation. According to the research results, the organizational culture is transmitted from the vision, mission, strategies, and core competencies to employees, a formal transmission of the innovative culture that employees must recognize, understand and follow. Moreover, informal meetings are also a tool to create an innovative culture in order to engage people in creative conversation. In addition, employees also pass the work culture from one generation to the next as well. Thus, the transmission of organizational culture in various ways can help the employees to invent, discover, and develop products and services.

4.1.3.4 The role of human resource management practices in fostering public service innovation

Human resource management practices play a crucial role in creating innovation because human resource management is relevant to managing the people that participate in innovation management. The organization recognizes the challenge of implementing human resource management practices. Human resource management is a systematic process of managing people working in the organization regarding recruitment, selection, training and development, evaluation, and promotion. The key informants mostly stated that human resource practice plays a vital role in managing people to promote innovation. The research results suggest that recruitment and selection of the right people for the organization play a key role in

creating innovation. The organization can screen the candidate that has skills and abilities suitable for job responsibility. Some of the key informants provided information in this regard as follows:

> "Human resource management has taken part in recruiting people into the department. Although the department may not have clearly defined the characteristics of people involved in innovation, we can look at people with the mindset to work with us."

> "One of the qualities to look for when choosing people to work is creativity. Sitting for an initial interview may not tell if the person can work in innovation, but we can see how creative this person can come in and work with the agency."

> "Recruitment process is important for innovation work besides looking for the person who has specialized knowledge; the organization can look for people with the same mindset to do the same work."

Job design represents a valuable human resource management tool that can significantly change daily working practices by modifying the job's potential and work behavior. It describes the content and organization of one's work tasks, activities, relationships, and responsibilities. Job design, including job autonomy, skill variety, and job feedback, influences innovative work behavior, increases employee motivation, and helps on engage in innovative activities. The key informants indicated that job design (e.g., flexible time management, job autonomy, and job challenges) promotes novel ideas in practical ways. Furthermore, interaction with others is another social job characteristic that is vital for idea generation and for implementing new ideas, as indicated in the following excerpts:

> “The development of innovation has a definite deadline according to the operational goals of the project, which requires the team will have the freedom to manage their working time.”

> “The innovation team has the freedom to manage working time allow the innovative project was completed by the scheduled time.”

> “Innovation is not easy because it requires thoughtfulness and the ability to track the changes, which is a challenge for the team to complete.”

> “Cross-functional collaboration encourages the exchange of knowledge with each other and also creates relationships among members.”

> “The organization is providing employees with freedom and independence to determine which procedures should be used to carry out that increase dedication to the innovation process.”

Creative work requires the acquisition of skills and expertise through training and development. Therefore, training and development can enhance employees’ knowledge and the skills that are necessary and critical for increasing creative ideas. The key informants stated that the organization supports budgets to encourage employees to train inside and outside the organization. The organization also encourages employees to continue their education by providing scholarships to encourage them to have more knowledge and expertise in their job responsibilities, as some of the key informants indicated:

> “The agency has regular training, so there are training courses that develop employees in the field of innovation work both internal and external, such as workshops to develop the innovation potential of the organization in order to develop more innovative knowledge.”

"The HR department will offer external training courses to the Innovation Agency. The Staff Division will consider the courses suitable for the department and send them out for training. In this regard, the agency may hire a consultant on its own, but it must be worthwhile for the investment because the money spent is public taxes."

"The Department provides opportunities for training with external agencies involved in innovation development, such as Office of the Public Sector Development Commission (OPDC) and agencies involved in developing digital systems in the public sector. Thus, employees can acquire innovative development ideas and be able to apply their knowledge to work."

The key informants indicated that performance appraisal increases motivation and creativity because it helps employees receive feedback that recognizes the gaps between their performance and the organization's goal. Most of them indicated that the leader evaluates the innovation performance from the core competencies such as the results of experiments, the number of innovative projects, and the expertise in applying technology to solve job problems. Some of the details can be seen in the following statements:

"Since the Department of Medical Sciences already has a core mission of innovation, innovation is part of the Department's core competencies that employees must be assessed."

"The Department of Fisheries has competencies related to innovation in terms of services that require knowledge of new technologies in their professional field. Thus, they can be applied to

government practices and integrate knowledge to be used in the creation of new things."

"The department's primary mission is research and service, so innovation is one of the indicators for an assessment. For example, the Division of Genomic Medicine and Innovation Support focuses on research rather than service. Performance assessment is measured at the development of new disease tests brought to the public such as the development of a COVID-19 Strip Test."

The key informants pointed out that the innovative organization needs rewards and recognition to motivate creativity because rewards can attract and retain creative people. Moreover, rewards and recognition motivate the extra effort needed to innovate. From the key informants' perspective, the public sector provides more intrinsic rewards than extrinsic rewards, such as pride in employee achievement and publicize innovation achievements in the organization's journal. The key informants provided more details as follows:

"At the department, agencies have been given presentations on innovations and have been awarded many times. This is the ninth time and brings the winning innovation to further develop and submit the contest at OPDC. As a result of continuous innovation development, the Department's work has been praised by the Ministry."

"The Department of Land Transport has not yet reached the level of the internal competition, but only by allowing each agency to select a specific process or activity, the central agency will select it and present the administrative section for further development.

When receiving the award, the executive congratulated and publicized it in the journal so that everyone can join together to celebrate the success and see it as a reward for everyone."

"In most cases, the executive award a compliment. In addition, the award-winning innovation is published in the department's journals. Thus, all employees in the Department can join together to congratulate them on their achievements and recognize that the innovation that has been awarded belongs to everyone in the organization."

In conclusion, human resource management practice can enhance innovation in the organization. The organization obtains the benefit of employee's potential through human resource management practices. Recruiting and selection attract the best people that have skills and capabilities that lead to innovation. Training and development enhance employee creativity and the ability to contribute to an innovative culture. The organization can support a training budget for training both inside and outside the organization. Performance appraisals can serve as a valuable tool in the creation of a culture of innovation. Finally, rewards and recognition can be used to reinforce the importance of innovation and inspire employees never to stop being innovative.

4.1.3.5 The organizational structure design in fostering innovation.

An appropriate structure will support the organization's success in creating innovation. The organization that focuses on innovation will emphasize decentralization and network building, enabling information and resource exchanges and improving work efficiency. Furthermore, a more flexible and agile structure is needed in order to be able to respond to environmental changes with greater interaction, communication, and decision-making. The key informants indicated that decentralized organizations foster innovation because it facilitates creative ideas in product and service improvement. Moreover, employees have more freedom to decide

and control their activities. Each department has a different structure in implementing innovation. For example, the Department of Land Transport has set up ad-hoc project teams by integrating specialists across functions. On the other hand, the Department of Fisheries assigns innovation development as a routine job for all divisions. Furthermore, each department encourages employees to be specialists in individual job responsibility and can be generalists in order to apply knowledge across functional areas. The key informants provided information in this regard as follows:

> "The department has established a working group by selecting from people with their own specialized knowledge and abilities because the development of innovation requires a combination of knowledge, for example, innovative work of the Transport Office Area 5 brings officers from the Procurement Department, the Law Department, and the IT Department to work together."

> "Teamwork is not just with internal agencies, but the department also encourages working with external agencies such as non-governmental organizations and private organizations to develop joint innovation."

> "The department encourages personnel's specialization by supporting personnel development in each position to have expertise in their work. At the same time, personnel must apply their knowledge and abilities with others in the department to be able to work together."

In conclusion, the organizational structure plays a vital role in facilitating innovation development. The organization uses a decentralized structure to control the innovation development projects by building project teams or cross-functional

teams. A decentralized structure shows bottom-up ideas, comments, and decisions, and employees can act more quickly to make a decision and solves problems.

4.1.3.6 The organizational system applying public service innovation

A strong organizational system can help the organization improve and achieve its innovation goals. Organizations need to adjust their system and operating methods to be consistent with innovation. The key informants stated that the organizational system is one of the most critical factors in developing innovation. The organization that prepares the system for supporting innovation can improve efficiency, productivity, and decision-making.

Communication system

Communication is the system that develops a consistent understanding and shares ideas, knowledge, experiences among members, and encourages employees to follow the core values. The key informants indicated that communicating effectively can enable the organization to achieve shared values and success in innovation management. The key informants suggested that the organization with innovation goals should consider developing a communication system by establishing multiple communication channels to accommodate innovation, regarding both formal and informal communication, for example, via meetings, websites, social networks, and coffee meetings. The key informants also suggest that two-way communication improves trust between leadership and employees and enhances collaboration across the organization, leading to more creativity and innovation, as some of the key informants indicated:

> “The communication system in the organization is two-way communication. In addition to executives listening to suggestions, the organization also has various channels to access various information, whether it be a social network or website.”

> “Employees are encouraged to meet or have a channel for exchanging ideas and information with each other.”

> “The organization organizes a coffee meeting for employees in order to have the opportunity to exchange knowledge and experience in innovation.”

> “The organization uses both formal and informal communication during the innovation process; the formal communication uses to communicate policy and plan while informal communication help to discuss and find the solution.”

A communication system is required for creating innovation because if people do not communicate with each other, knowledge will not be transferred; therefore, the organization must support various communication channels. Moreover, an effective communication system builds trust and collaboration within the team and with cross-functional teams for optimal performance outcomes the new product and service development.

Resource management

A successful innovation organization needs to make a permanent resource allocation of money, equipment, and people necessary to support innovative projects. Money is a necessary resource to support innovation because innovation cannot happen without a dedicated budget to support projects. Government agencies will allocate budgets to support innovation through project proposals. The project’s approval depends on compliance with the department’s strategic plan and following the people’s needs. Sufficient equipment is also crucial for the innovation process because it is a tool for supporting innovation from the beginning until the project is completed. Equipment becomes the primary tool in some departments in the public

service to serve people more quickly. Thus, supporting adequate equipment is vital in promoting innovation, as some of the key informants suggested:

> "The organization supports all the resources and equipment needed to develop services such as electronic devices like tablets for checkpoint officers because electronic signatures are now required."

> "Government funding is in the form of proposals for plans or projects, which must be projected to use the budget in advance. Therefore, once the project has been approved, the budget must be used in accordance with the plan, which is difficult to obtain additional funds outside of the planned budget because the reasons and necessity for the expenditure must be identified in order to be considered again."

> "The agency has a committee to consider funding for each project based on the reason for necessity and trends of each year situation. If the proposed project is consistent, it will be considered. For example, during these 1-2 years, the department will approve funds for projects related to emerging infectious diseases."

The organization's resources enable the development of innovation. In general, requests for resources from government agencies such as budgets need to be planned one year in advance. The budget needs to be considered more carefully, which differs from a private organization with greater budgeting approval flexibility. However, despite these limitations, the agency needs to support resources continuously and provide them sufficiently in order to achieve the innovation goals.

Knowledge management

Information is the critical resource for decisions and for creating innovative organizations. Thus, the organization needs good information management systems in order to transfer information to other teams or divisions to have the critical and necessary information to create innovation. In addition, knowledge management is a tool for the organization to utilize knowledge through collaboration and practice. A successful organization has a good knowledge management system to encourage knowledge exchange. The key informants illustrated that acquiring knowledge and skills through collaboration is an effective way to achieves successful innovation. The results show that knowledge management has several tools designed to transfer and exchange knowledge, for example, documents, forums, coaching, social network platforms, and websites, as the key informants discussed:

> "The organization has a knowledge management system collected from both inside and outside the organization, with employees able to access knowledge sources easily. This knowledge will be important in motivating employees to come up with new ideas."

> "Knowledge management, in addition to being in the form of information published in various department channels, opening for interested people to meet and exchange knowledge with each other, is considered knowledge management that enables people in the organization to learn together."

> "The agency publishes innovation information in various channels such as online platform, information board, and journals."

The innovation process highly depends on knowledge because the new knowledge is converted into products and services by transforming the general

knowledge into specific knowledge. The knowledge management system can help employees expand their creativity to improve the innovation process for quicker access and to transfer the new knowledge. Moreover, knowledge management provides platforms, tools, and processes to ensure the integration of the organization's knowledge base. Thus, supporting knowledge management by developing channels within the organizations to share their knowledge with others can facilitate collaboration in the innovation process.

The organizational system is the basis for each organization to support organizational management, which must focus on adjusting the system to support members' work in order to develop the roles, behaviors, and operations to foster innovation. Having a good organizational system is important for supporting employees because it helps them work more conveniently and quickly.

In summary, the qualitative results show that public service innovation's success depends on many factors, and each factor contributes to success in promoting innovation. Innovative leadership plays an important role in directing and supporting innovation with vision, empowerment, having an open mind, being an open risk-taker, and a team builder. Innovation strategies are also essential because strategies provide visions and directions to ensure that all employees have a clear goal and follow the organization's direction. Organizational culture is another factor that promotes innovation because organizations build an innovative culture and share it with employees through rules, norms, and values; the employees will reflect the culture in their attitudes and behavior. Therefore, the organizational structure becomes even more critical when an organization is dealing with innovation. Designing the organizational structure to suit innovation development such as teamwork and cross-functional team facilitates the innovation process. Human resource management is a system for the support and management of the employees that participate in innovation management in terms of competency, recruitment and selection, training and development, performance appraisals, and rewards and recognition. The organizational system: knowledge management, resource management, and communication management has been regarded as a vital approach in supporting innovation in improving efficiency, productivity, and decision-making.

4.2 Results of the Quantitative Research

4.2.1 Basic Information on the Respondents

Basic information on the target sample is the employees working in the Department of fisheries, the Department of Land Transports, and the Department of Medical Sciences is presented in this section. Three hundred and fifty answered questionnaires were returned out of the 393 survey packs distributed to the respondents, representing a response rate of 89.05%.

Table 4.6 Number and Percentage of Respondents

N= 350

Characteristics	Number	Percentage
Gender		
Females	190	54.29
Males	160	45.71
Education		
Lower than a bachelor's degree	8	2.29
Bachelor's degree	242	69.14
Master's degree	80	22.86
Doctoral degree	20	5.71
Departments		
The Department of Fisheries	125	35.71
Department of Land Transport	90	25.71
Department of Medical Sciences	135	38.57
Work Position		
Chief	95	27.14
Officer	255	72.86
Work Experience		
1-5 years	167	47.71
6-10 years	68	19.43
More than 10 years	115	32.86

Data from the survey questionnaires show the statistical data analysis results that can be sum up as follows. There were 190 females respondents (54.29%) and 160 males (45.71%). Most of the participants had obtained a bachelor's degree (n= 242, 69.14%), followed by a master's degree (n=80, 22.86%), a doctoral degree (n=20, 5.71%) and lower than a bachelor's degree (n=8, 2.29%). The majority of the respondents worked in the Department of Medical Sciences (n= 135, 38.57%), followed by the Department of Fisheries (n=125, 35.71%) and the Department of Land Transport (n=90, 35.71%). The majority of the sample worked as in officers 255 (72.86%), while there were 95 chiefs (27.14%). Most of the participants had worked at their current organization for 1-5 years (n=167, 47.71%), followed by more than 10 years (n=115, 32.86%) and 6-10 years (n=68, 19.43%).

4.2.2 Descriptive Statistics

In this section, the researcher describes the statistically variable constructs. There are seven constructs: innovative leadership, organizational culture, innovation strategy, organizational structure, human resource management, organizational system, and organization management effectiveness. The observed variables were measured on a scale from 1 to 6. Each item was based on a six-point Likert scale ranging from 1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 =Strongly Agree. The total number of respondents was 350.

Table 4.7 Descriptive Statistics of the Variables

Construct	Variables	Mean	S.D.	Min	Max
Innovative Leadership	IL1: The leader has a clear policy on innovation management.	4.71	.758	1	6
	IL2: The leader can establish vision, goals, and innovative strategies.	4.68	.706	1	6
	IL3: The leader has knowledge and ability regarding innovation	4.70	.796	1	6

Construct	Variables	Mean	S.D.	Min	Max
	management.				
	IL4: The leader involved in the innovation process.	4.78	.748	3	6
	IL5: The leader implements new processes at work to generate new ideas for creating innovation.	4.44	.757	2	6
	IL6: The leader dares to take the risks and accept failure that might occur.	4.39	.782	1	6
	IL7: The leader empowers employees to work on innovative projects.	4.42	.869	2	6
	IL8: The leader can coach and advise employees on innovative projects.	4.52	.717	2	6
	IL9: The leader gives the techniques for problem-solving in the innovation process.	4.61	.796	2	6
	IL10: The leader is open to accepting personnel to express opinions and criticism to solve problems.	4.60	.746	2	6
	IL11: The leader provides constructive feedback to employees.	4.53	.748	2	6
	IL12: The leader encourages employees to generate creative ideas and solutions.	4.61	.752	2	6
	IL13: The leader facilitates collaborative teamwork in	4.83	.784	2	6

Construct	Variables	Mean	S.D.	Min	Max
	innovative projects.				
	IL14: The leader creates an excellent learning environment to promote innovation.	4.93	.742	2	6
	IL15: The leader uses a formal channel such as policies, memos, and meetings to communicate and gather initial information and to find solutions in innovative projects.	4.81	.751	2	6
	IL16: The leader motivates employees to contribute to the success of innovative projects by giving rewards and recognition.	4.89	.873	2	6
	IL17: The leader fosters a workplace culture that allows people to try new things and think “outside the box.”	4.76	.784	1	6
	IL18: The leader supports a workplace culture in which employees are always eager to learn.	4.60	.772	1	6
	IL19: The leader develops a culture that supports employees to share knowledge and coordinate with others.	4.67	.752	2	6
	IL20: The leader promotes best KM practices that relate to innovation.	4.76	.774	1	6
	IL21: The leader facilitates	4.71	.741	2	6

Construct	Variables	Mean	S.D.	Min	Max
	information sharing across the organization.				
	IL22: The leader supports the development of innovative exchange channels such as organizational websites and social media.	4.72	.772	1	6
	IL23: The leader provides critical resources and tasks to implement innovation.	4.64	.796	1	6
	IL24: The leader effectively utilizes existing resources and increases resource activities to develop innovation.	4.47	.828	2	6
Innovation Strategy	IS1: Your organization has a policy for boosting innovation.	4.75	.922	2	6
	IS2: Your organization has a vision that shows the desire to create innovation.	4.60	.942	2	6
	IS3: Your organization communicates its vision, strategies, and goals related to innovation at all organizational levels.	4.59	.922	2	6
	IS4: Your organization has developed an innovation strategy as a guideline for promoting innovation.	4.64	.929	2	6

Construct	Variables	Mean	S.D.	Min	Max
	IS5: Your organization has a process to convert innovation strategy into an annual action plan.	4.59	.841	2	6
	IS6: Your organization sets innovative strategy goals at a level that can be achieved.	4.52	.926	2	6
	IS7: Your organization has continuous and systematic innovation strategy development.	4.62	.816	1	6
	IS8: Your organization monitors and measures innovation performance according to the strategic plan.	4.91	.842	1	6
	IS9: Innovation strategies help your organization have a clear direction to implement innovation.	5.01	.846	2	6
	IS10: Your organization adjusts its strategies to a fast-changing work environment.	4.76	.899	2	6
Organizational Culture	OC1: Innovation is a shared value in your organization.	4.63	.772	2	6
	OC2: Your organization encourages employees to recognize and be responsible for the organization's innovation goals.	4.67	.859	2	6
	OC3: Your organization has an open culture by supporting	4.68	.786	2	6

Construct	Variables	Mean	S.D.	Min	Max
	diversity and accepting different opinions.				
	OC4: Your organization has a proactive culture to drive innovation in the organization.	4.69	.767	2	6
	OC5: Your organization has an organizational culture that encourages employees to take risks and accepts mistakes without punishment.	4.60	.776	2	6
	OC6: Your organization culture shows an adaptive readiness to deal with change.	4.73	.813	2	6
	OC7: Your organization creates a culture of teamwork.	4.87	.780	2	6
	OC8: Your organization builds a competitive culture to motivate the employee to initiate new ideas.	4.84	.760	2	6
	OC9: Your organization has an empowered culture for employees at all levels.	4.75	.822	1	6
	OC10: Your organization creates a continuous learning culture.	4.77	.778	2	6
Organizational Structure	OT1: Your organization has decentralized employees to have the authority to make decisions in the innovation process.	4.86	.920	1	6

Construct	Variables	Mean	S.D.	Min	Max
	OT2: The organizational structure in your organization encourages a flexible work environment for decision and their implementation.	4.78	.846	2	6
	OT3: The organizational structure in your organization increases involvement for employees in the innovation process.	4.90	.813	3	6
	OT4: Your organization has a flexible organizational structure to facilitate innovation.	4.72	.878	1	6
	OT5: Your organization gives employees the freedom to work on innovative projects.	4.84	.886	3	6
	OT6: The organization adjusts its structure under the innovation strategy.	4.87	.868	1	6
	OT7: Your organization promotes specialization to initiate innovation.	4.90	.826	3	6
	OT8: Your organization has established a special unit to be responsible for creating innovation.	4.88	.867	2	6
	OT9: Your organization creates across functional team members to share various knowledge, and expertise for developing innovation.	5.09	.841	2	6

Construct	Variables	Mean	S.D.	Min	Max
	OT10: Your organization creates networks with external agencies to exchange information and resources.	5.05	.895	1	6
Human Resource Management Practice	HR1: Your organization recruits and selects competent employees that are consistent with creating and developing innovation.	4.74	.882	1	6
	HR2: Your organization specifies innovation as a core competency.	4.73	.854	2	6
	HR3: Your organization develops competency, indicating the performance, attitudes, and skills relevant to promoting innovation.	4.60	.818	2	6
	HR4: Your organization provides training and skills development for the creativity and innovation of employees.	4.96	.943	1	6
	HR5: The training in innovation in your organization encourages you to feel that you are important enough to contribute your ideas to foster innovation.	4.73	.898	2	6
	HR6: Your organization supports employees to acquire new knowledge to find solutions in innovative projects.	4.55	.769	2	6

Construct	Variables	Mean	S.D.	Min	Max
	HR7: You can apply creative ideas to solve complex problems that are within your job responsibility.	4.51	.807	2	6
	HR8: Your organization has job rotation for developing the ability to work.	4.37	.849	1	6
	HR9: Job rotation increases the level of flexibility, freedom, and cooperative teamwork.	4.41	.795	2	6
	HR10: Your organization increases flexibility in job responsibilities such as work time.	4.73	.803	2	6
	HR11: Your organization supports a work-life balance for employees to spend time thinking of creative things.	4.38	.812	1	6
	HR12: Your organization has an open-door policy to allow employees to exchange ideas and comments with the managerial positions at all levels.	4.56	.830	1	6
	HR13: Your organization has defined innovation as part of the performance evaluation criteria.	4.63	.825	1	6

Construct	Variables	Mean	S.D.	Min	Max
	HR14: Your organization allows employees to participate in setting performance evaluation goals.	4.72	.935	1	6
	HR15: Your organization maintains and reduces the turnover rate of creative and innovative employees.	4.54	.962	1	6
	HR16: Your organization rewards employees for their achievement in innovation.	4.68	.769	2	6
	HR17: Your organization provides extrinsic rewards when employees achieve innovation goals such as incentives, bonuses, and special rewards.	4.59	.843	1	6
	HR18: Your organization provides intrinsic rewards when employees achieve innovation goals such as appreciation, empowerment, and freedom.	4.70	.918	2	6
Organizational System					
- Communication	OS1: Your organization has various communication channels that employees can access, such as social media, email, boards, and web boards.	4.71	.758	1	6

Construct	Variables	Mean	S.D.	Min	Max
	OS2: Your organization has a channel to exchange knowledge and information about innovation that all employees can easily access.	4.68	.706	1	6
	OS3: Your organization communicates about service innovation to stakeholders such as service recipients.	4.70	.796	1	6
	OS4: Your organization supports internal communication (e.g., face-to-face communication, emails, and group meetings) among team members to support idea generation and to improve the quality of products and services in innovative projects.	4.78	.737	3	6
-Resource Management	OS5: Your organization provides sufficient physical resources dedicated to tasks, e.g., technology and equipment.	4.44	.757	2	6
	OS6: Your organization provides sufficient intangible resources, e.g., staff and knowledge in the innovation projects.	4.39	.782	1	6
	OS7: Your organization supports enough funds in R&D in the innovation projects.	4.42	.869	2	6

Construct	Variables	Mean	S.D.	Min	Max
	OS8: Your organization has a strategic plan in resource management to deal with uncertain environments.	4.52	.717	2	6
-Knowledge Management	OS9: Your organization encourages employees to share knowledge and information formally, e.g., meetings and reports.	4.61	.796	2	6
	OS10: Your organization encourages employees to share knowledge and information informally, e.g., informal talks, social media, and web-boards.	4.60	.746	2	6
	OS11: Your organization gathers knowledge and information about innovation from both inside and outside the organization.	4.53	.748	2	6
	OS12: Your organization searches for employees creative ideas and pushes those ideas into innovation.	4.61	.752	2	6
	OS13: Your organization provides easy access to knowledge through different channels such as the intranet, Internet, meetings, policies, and procedures.	4.83	.784	2	6

Construct	Variables	Mean	S.D.	Min	Max
	OS14: Knowledge sharing in your organization increases the participation level in learning and creates new knowledge.	4.93	.742	2	6
	OS15: Your organization supports knowledge sharing among groups to transfer creative ideas.	4.81	.751	2	6
	OS16: Knowledge sharing between employees helps the organization successfully adopt new ideas, products, and services.	4.89	.873	2	6
	OS17: Your organization systematically collects employees' ideas in order to use those ideas to create innovation.	4.76	.784	1	6
	OS18: Your organization has knowledge applications related the current knowledge to solve existing problems.	4.60	.772	1	6
	OS19: Knowledge application plays an important role in increasing administrative and technical innovation in your organization.	4.67	.752	2	6
Innovation Management Effectiveness	IM1: Your organization improves its overall organizational performance when adopting innovation.	5.08	.838	3	6

Construct	Variables	Mean	S.D.	Min	Max
	IM2: Your organization has improved productivity in public services.	5.07	.794	3	6
	IM3: Your organization's service innovation improves the quality of services to the public comprehensively and systematically.	5.09	.868	3	6
	IM4: Your organization has developed employees' potential in innovation development continuously.	5.08	.763	3	6
	IM5: Your organization continually encourages employees to participate in the development of innovation.	5.05	.795	3	6
	IM6: Your organization has a process to drive outstanding innovation projects to national competition.	5.04	.871	3	6
	IM7: Your organization has been recognized as a modern and high-performing one.	5.02	.777	3	6

The means of all the data are for the observed variables in the range of 5.09-4.37. The question with the highest mean was "Your organization creates across functional team members to share various knowledge and expertise for developing innovation," with a mean of 5.09. The lowest mean was "Your organization has job rotation for developing the ability to work," with a mean of 4.37.

In terms of the innovative leadership construct, the question with the highest mean was "The leader creates an excellent learning environment to promote

innovation," with a mean of 4.93, while the question with the lowest mean was "The leader dares to take risks and accept the failure that might occur," with a mean of 4.39.

Regarding the innovation strategy construct, the question with the highest mean was "Innovation strategies help your organization have a clear direction to implement innovation," with a mean of 5.01, while the question with the lowest mean was "Your organization sets innovative strategy goals at a level that can be achieved," with a mean of 4.52.

For the organizational culture construct, the question with the highest mean was " Your organization creates a culture of teamwork," with a mean of 4.87, while the question with the lowest mean was "Your organization has an organizational culture that encourages employees to take risks and accepts mistakes without punishment," with a mean of 4.60.

The organizational structure constructs with the highest mean was "Your organization creates across functional team members to share various knowledge and expertise for developing innovation," with a mean of 5.09, while the question with the lowest mean was "Your organization has a flexible organizational structure to facilitate innovation," with a mean of 4.72.

Regarding human resource management practice, the question with the highest mean was, "Your organization provides training and skills development for the creativity and innovation of employees," with a mean of 4.96, while the question with the lowest mean was "Your organization has job rotation for developing the ability to work," with a mean of 4.37.

The organizational system has three items that consist of communication, resource management, and the knowledge management construct.

The question for the communication construct with the highest mean was "Your organization supports internal communication" with a mean of 4.78, while the question with the lowest mean was "Your organization has a channel to exchange knowledge and information about innovation that all employees can easily access" with a mean of 4.68.

The resource management question constructs with the highest mean was "Your organization has a strategic plan in resource management to deal with uncertain environments" with a mean of 4.52, while the question with the lowest means was "Your organization provides sufficient intangible resources, e.g., staff and knowledge in the innovation projects" with a mean of 4.39.

The knowledge management question constructs with the highest mean was " The knowledge sharing in your organization can increase the participation level in learning and create new knowledge" with a mean of 4.93, while the question with the lowest means is "Your organization gather knowledge and information about innovation from both inside and outside the organization," with a mean of 4.53.

The innovation management effectiveness construct with the highest mean was "Your organization's service innovation can improve the quality of services to the public comprehensively and systematically," with a mean of 5.09, while the question with the lowest mean was "Your organization has been recognized as a modern and high-performing one," with a mean of 5.02.

The summary of each construct is shown in descriptive statistics, as shown in the table below.

Table 4.8 Summary of All the Constructs in the Descriptive Statistics

Constructs	**Number of respondents**	**Mean**	**S.D.**
Innovative leadership (24 Items)	350	4.66	.772
Organizational culture (10 Items)	350	4.72	.791
Innovation strategy (10 Items)	350	4.70	.888
Human resource management practice (18 Items)	350	4.62	.854
Organizational system (19 Items)	350	4.66	.770
-Communication management	350	4.72	.750
- Resource management	350	4.44	.781
- Knowledge management	350	4.71	.772
Organizational structure (10 Items)	350	4.89	.864

Constructs	Number of respondents	Mean	S.D.
Innovation management effectiveness (7 Items)	350	5.06	.815

The results of the summary of the constructs in the descriptive statistics from the 350 respondents from the three departments are given from the highest to lowest: innovation management effectiveness (5.06), Organizational structure (4.89), Organizational culture (4.72), Innovation strategy (4.70), Innovative leadership (4.66), Organizational system (4.66) and Human resource management practice (4.62).
Further, the descriptive statistics for all of the constructs according to all the constructs' means in each department are as follows.

Table 4.9 Descriptive Statistics of Constructs Split by the Department

Constructs	Departments	N	Mean	S.D.
Innovative Leadership	Department of Fisheries	120	4.49	.815
	Department of Land Transport	85	4.72	.681
	Department of Medical Sciences	125	4.77	.736
Innovation Strategy	Department of Fisheries	120	4.39	.997
	Department of Land Transport	85	4.83	.802
	Department of Medical Sciences	125	4.90	.727
Organizational Culture	Department of Fisheries	120	4.51	.920
	Department of Land Transport	85	4.82	.675

Constructs	Departments	N	Mean	S.D.
	Department of Medical Sciences	125	4.85	.680
Organizational Structure	Department of Fisheries	120	4.50	.827
	Department of Land Transport	85	4.65	.689
	Department of Medical Sciences	125	4.99	.783
Human Resource Management	Department of Fisheries	120	4.35	.852
	Department of Land Transport	85	4.75	.763
	Department of Medical Sciences	125	4.78	.811
Organizational System	Department of Fisheries	120	4.34	.827
	Department of Land Transport	85	4.69	.659
	Department of Medical Sciences	125	4.78	.734
Innovation Management Effectiveness	Department of Fisheries	120	4.82	.826
	Department of Land Transport	85	5.01	.832
	Department of Medical Sciences	125	5.06	.793

As seen from the table above, for innovative leadership: the Department of Medical Sciences (4.77), the Department of Land Transport (4.72), and the Department of Fisheries (4.49) have the highest to lowest scores.

For organizational culture, the Department of Medical Sciences (4.85), the Department of Land Transport (4.82), and the Department of Fisheries (4.51) had the highest to lowest scores.

For innovation strategy, the Department of Medical Sciences (4.90), the Department of Land Transport (4.83), and the Department of Fisheries (4.39) had the highest to lowest scores.

For organizational structure, The Department of Medical Sciences (4.99), The Department of Land Transport (4.65), and The Department of Fisheries (4.50) had the highest to lowest scores.

For human resource management, The Department of Medical Sciences (4.78), The Department of Land Transport (4.75), and The Department of Fisheries (4.35) have the highest to lowest scores, respectively.

For the organizational system, The Department of Medical Sciences (4.78), The Department of Land Transport (4.69), and The Department of Fisheries (4.34) had the highest to lowest scores.

For innovation management effectiveness, The Department of Medical Sciences (5.06), The Department of Land Transport (5.01), and The Department of Fisheries (4.82) had the highest to lowest scores.

Pearson's Correlation Coefficients

Table 4.10 shows the correlations between the variables. The correlation varied from .513 to .777. This indicated that the variables, including innovation management effectiveness, innovative leadership, organizational culture, innovation strategy, human resource management, organizational system, and organizational culture, did not have multicollinearity problems. All of the correlation coefficients were less than .85, which was considered acceptable (Kumari. 2008).

Table 4.10 Correlation Matrix of Variables

Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. Innovation Management Effectiveness (IM)	1.00						

Variables	1	2	3	4	5	6	7
2. Innovative Leadership (IL)	.674*	1.00					
3. Organizational Culture (OC)	.660*	.714*	1.00				
4. Innovation Strategy (IS)	.650*	.560*	.648*	1.00			
5. Human Resource Management (HR)	.595*	.660*	.625*	.604*	1.00		
6. Organizational System (OS)	.584*	.777*	.668*	.513*	.630*	1.00	
7. Organizational Structure (OT)	.667*	.712*	.664*	.598*	.528*	.535*	1.00

* Correlation is significant at the 0.05 level.

According to Pearson correlation results, Innovation Leadership (IL), Organizational Culture (OC), Innovation Strategy (IS), Human Resource Management (Mohrman, Tenkasi, & Mohrman Jr), Organizational System (OS), and Organizational Structure (OT) had a relationship with innovation management effectiveness at a significant level of .05. The most correlated factor with innovation management effectiveness was Innovative Leadership (r=.674, p<.001). The second highest was organizational structure (r=.667, p<.001), and the lowest correlate was the organizational system (r=.584, p<.001). In addition, Innovative Leadership has a relationship with Innovation Strategy at a statistically significant level of .05 (r=.650, p<.001), and innovative leadership had a relationship with organizational culture at a statistically significant level of .05 (r=.714, p<.001). Moreover, organizational culture has a relationship with organizational structure at a statistically significant level of .05 (r=.598, p<.001).

4.2.4 Path Analysis

Table 4.11 Path Analysis

Paths	*B*	β	*SE*	*t*	*p*	R^2
H1: Innovative Leadership → Innovation Management Effectiveness	0.31	.350	0.22	1.58	.114	.609
H2: Innovation Strategy → Innovation Management Effectiveness	0.21	.231	0.07	3.51*	<.001	

Paths	*B*	β	*SE*	*t*	*p*	R^2
H3: Organizational Culture □ Innovation Management Effectiveness	0.23	.254	0.06	3.72*	<.001	
H4: Organizational Structure → Innovation Management Effectiveness	0.25	.278	0.06	4.06*	<.001	
H5: Human Resource Management → Innovation Management Effectiveness	0.18	.225	0.06	2.89*	.017	
H6: Organization System → Innovation Management Effectiveness	0.15	.202	0.07	2.58*	<.001	
H7: Innovative Leadership → Innovation Strategy	0.83	.560	0.05	11.24*	<.001	.514
H8: Innovative Leadership → Organizational Culture	0.92	.714	0.04	19.36*	<.001	.510
H9: Organizational Culture → Organizational Structure	0.56	.477	0.05	10.02*	<.001	.427

*p < .05

It can be interpreted that Innovative Leadership (IL), Organizational Culture (OC), Innovation Strategy (IS), Human Resource Management (HR), Organizational System (OS), and Organizational Structure (OT) had a predictive power of 60.90% (R^2=.609).

Innovation Leadership (IL) had a positive effect on innovation management effectiveness (IM), but not at a statistically significant level at .05 (β =.350, *p*=.114); thus, innovative leadership did not have a direct effect on innovation management effectiveness. However, innovation strategy (IS) had a positive effect on innovation management effectiveness (IS) (β =.231, *p*=<.001), at a statistically significant level of .05. Organizational culture positively affected innovation management effectiveness (IM) (β =.254, *p*=.114) at a statistically significant level of .05. Organizational structure (OT) had a positive effect on innovation management effectiveness (IM) (β =.278, *p*=<.001), at a statistically significant level of .05. Human resource management had a positive effect on innovation management effectiveness (IM) (β =.225, *p*=0.17) at a statistically significant level of .05. Finally,

the organizational system (OS) had a positive effect on innovation management effectiveness (IM) (β =.202, *p*=<.001) at a statistically significant level of .05.

Table 4.12 Indirect effects of Variables in the Path Analysis Model

Paths	*B*	β	*SE*	*t*	*p*	R^2	Results
IL → IS → IM	0.17	.211	0.04	2.31*	.021	.409	Indirect Impact
IL → OC → IM	0.12	.144	0.05	1.56*	<.001		Indirect Impact
OC → OT → IM	0.17	.197	0.03	3.82*	<.001		Indirect Impact
IL → OC → OT → IM	0.16	.186	0.02	3.66*	<.001		Indirect Impact

*$p < .05$

The indirect effect results show that innovative leadership indirectly affected innovation management effectiveness at a significance level of 0.05 with an indirect effect through innovation strategy (β =.211, *p*=.021). In addition, innovative leadership indirectly affected innovation management effectiveness through organizational culture (β =.144, *p*<.001).

Organizational culture had an indirect effect on innovation management effectiveness, with a significance level of 0.05 with an indirect effect through organizational structure (β =.197, *p*<.001). Moreover, innovative leadership indirectly affected innovation management effectiveness, with a significance level of 0.05 with an indirect effect through organizational culture and organizational structure (β =.186, *p*<.001).

From the results of the path analysis, the researcher summarized the influence and statistical significance of the test results of the path coefficients and coefficient of determination, as shown in figure 4.1

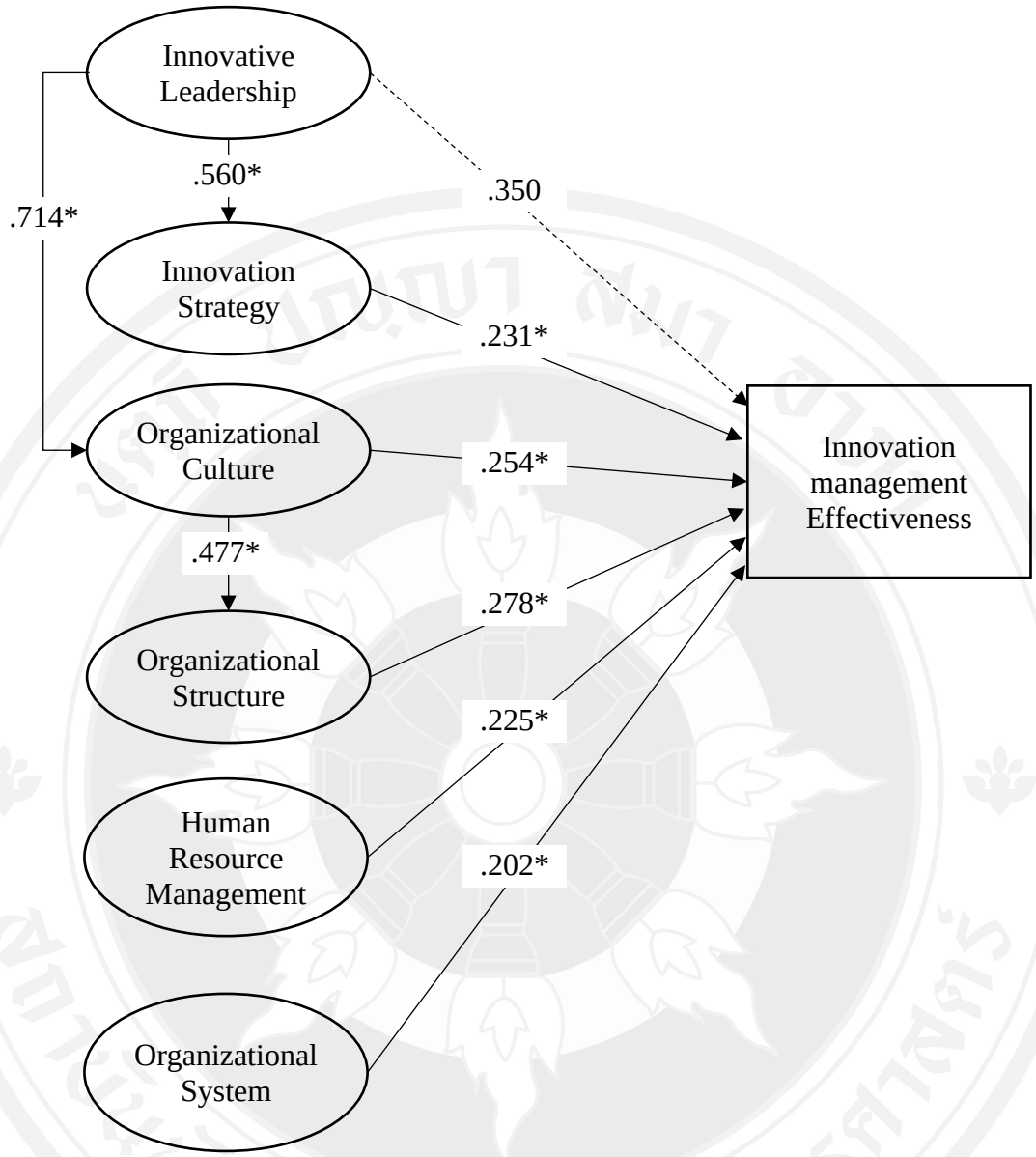

Figure 4.1 Path analysis

4.2.5 Testing of Research Hypotheses

According to the framework, the researcher proposed research hypotheses, and the results of the hypothesis testing are as follows:

H1: Innovative leadership has a positive effect on innovation management effectiveness.

This hypothesis was not supported in that innovative leadership positively affected innovation management effectiveness (β =.350, *p*=.114). This indicates that innovative leadership has no statistical effect on innovation management effectiveness. However, the work of Denti and Hemlin (2012), Hunter, Bedell, and Mumford (2007), and Soosay (2005) supported the relationship of innovative leadership as being a positive one with innovation management effectiveness as indicated in the literature.

H2: Innovation strategy has a positive effect on innovation management effectiveness.

This hypothesis was supported in that innovation strategy positively affected innovation management effectiveness with a significance level of 0.05 (β =.231, *p*=<.001). This indicates that a higher degree of innovation strategy leads to a higher degree of innovation management effectiveness. This result supports the work of Potts and Kastelle (2010), Nybakk and Jenssen (2012), and Stowe and Grider (2014).

H3: Organizational culture has a positive effect on innovation management effectiveness.

This hypothesis was supported in that organizational culture positively affected innovation management effectiveness (β =.254, *p*=<*.001*). This indicates that organizational culture has a statistical effect on innovation management effectiveness. The result supports the work of Krivokapic and Kavaric (2015), Woszczyna (2015), and Ramachandran, Devarajan, and Ray (2006).

H4: Organizational structure has a positive effect on the innovation management effectiveness.

This hypothesis was supported in that organizational structure had a positive effect on innovation management effectiveness with a significance level of 0.05 (β =.278, *p*=<*.001*). This indicates that a higher degree of organizational structure leads

to a higher degree of innovation management effectiveness. This result supports the work of Palmer & Dunford (2002), Cosh et al. (2012), and Suwannathat et al. (2015).

H5: Human resource management has a positive effect on the innovation management effectiveness.

This hypothesis was supported in that human resource management positively affected innovation management effectiveness with a significance level of 0.05 (β =.225, p=0.17). This indicates that a higher degree of human resource management leads to a higher degree of innovation management effectiveness. This result supports the work of Jiang et al. (2012), Wang and Zhao (2012), and Tan and Nasurdin (2015).

H6: The organizational system has a positive effect on innovation management effectiveness.

This hypothesis was supported in that organizational system had a positive effect on innovation management effectiveness with a significance level of 0.05 (β =.202, p=<.001). This indicates that a higher degree of the organizational system leads to a higher degree of innovation management effectiveness. This result supports the work of Bessant et al. (2011), Srivastava and Moreland (2012), and Lee (2016).

H7: Innovative leadership has a positive effect on innovation strategy.

This hypothesis was supported in that innovative leadership positively affected innovation strategy with a significance level of 0.05 (β =.560, p<.001). This indicates that a higher degree of innovative leadership leads to a higher degree of innovation strategy. The result supports the work of Bouhali et al. (2015), Vehar (2015), and Zuraik (2016)

H8: Innovative leadership has a positive effect on organizational culture

This hypothesis is supported in that innovative leadership positively affects organizational culture with a significance level of 0.05 (β =.714, p<.001). This indicates that a higher degree of innovative leadership leads to a higher degree of organizational culture. The result supports the work of Chun, and Lee (2008), Lin and McDonough III (2011), and Woszczyna (2015).

H9: Organizational culture has a positive effect on organizational structure.

This hypothesis was supported in that organizational culture positively affects organizational structure with a significance level of 0.05 (β =.477, p<.001). This indicates that a higher degree of organizational culture leads to a higher degree of

organizational structure. This result supports the work of Martins and Martins (2002), Martins and Terblanche (2003), and O'Reilly and Tushman (2011).

Table 4.13 Summary of the Results of the Hypothesis Testing

Hypotheses	**Relationship**	**Results**
H1	Innovative leadership has a positive effect on innovation management effectiveness	Not Supported
H2	Innovative leadership has a positive effect on innovation strategy	Supported
H3	Innovative leadership has a positive effect on organizational culture	Supported
H4	Innovation strategy has a positive effect on innovation management effectiveness	Supported
H5	Organizational culture has a positive effect on the innovation management Effectiveness	Supported
H6	Organizational structure has a positive effect on the innovation management effectiveness	Supported
H7	Human resource management practice has a positive effect on the innovation management effectiveness	Supported
H8	Organizational system has a positive effect on the innovation management Effectiveness	Supported
H9	Organizational culture has a positive effect on organizational structure	Supported

CHAPTER 5

CONCLUSION, DISCUSSION, AND RECOMMENDATIONS

5.1 Conclusion

Most of the respondents in the quantitative study were female (n=190, 54.29%) and had obtained a bachelor's degree (n= 242, 69.14). The majority of the respondents worked in the Department of Medical Sciences (n= 135, 38.57%). Most of them had work positions as an officer (255 or 72.86%), and most of the participants had worked at their current organization for 1-5 years (n=167, 47.71%). In addition, in the qualitative study, there are 16 key informants from 3 organizations: 6 key informants from The Department of Fisheries, 5 key informants from the Department of Land Transport, and 5 key informants from the Department of Medical Sciences.

The characteristics of the awarded organization were divided into three aspects as follows.

Organization innovation management

The awarded organization creates an innovation management process that will sustain the high-performance organization. The beginning of the best innovation management of the organization is to have a leader that recognizes the importance of innovation. Leaders understand the importance of innovation management and know what it takes to lead a team to success. Moreover, the awarded organization manages innovation by improving and developing work systems and creating appropriate innovation using the knowledge of employees combined with the acquisition of knowledge outside the organization to develop into innovation. The awarded organizations also have a strong culture of innovation that will be passed on to the entire organization by encouraging idea-sharing to ensure that all employees are a part of the process. This will result in greater innovation opportunities over time.

The employee's potential in innovation management

The organization supports training to provide knowledge related to innovation both inside and outside the organization to have continuous development. Having the knowledge, skills, and ability to innovate and develop innovations can increase employee potential and innovation processes. The organization also partners with other agencies, such as private organizations, to promote a continuous exchange of knowledge and experience in developing innovation. In addition, the awarded organization adopts innovation as part of KPIs; thus, employees realize that innovation is a duty and that when thinking about new things, there is a concrete process in delivering, screening, developing, and building on that idea.

The competence of public service

Innovations introduced in organizational processes help to improve and develop services, reduce work hours, produce quality work, and innovate quickly. Innovation also provides people with more comprehensive service, that is equitable, faster, and efficient. The innovation award shows that the organization is delivering a quality product or service to the public and is being practical. In addition, success in managing service innovation improves public organizations' image to become an organization with a modern image and to be a high-performance organization.

The determinants affecting innovation management effectiveness

Innovative leadership

The study found that the top management of all awarded organizations focuses on innovation; the leader is the critical factor that will contribute to the successful creation of an innovative organization. The leaders have an important role in directing, fostering, and supporting all activities related to innovation. Nevertheless, the quantitative results showed that innovative leadership has no direct effect on innovation management effectiveness (β =.350, p=.*114*). However, innovative leadership was seen to have an indirect effect on innovation management effectiveness through innovation strategy (β =.560, p<.*001*) and organizational culture (β =.714, p<.*001*). In terms of innovation strategy, in the award organization, the

leader has a vital role in directing by formulating a suitable innovation strategy in order to achieve innovation capabilities. The leader is also the crucial person that influences organizational culture by defining innovation as the organization's values and norms. Leaders develop an innovative culture by empowering employees to initiate and share new ideas, contributing to fostering innovation development and driving the organization to manage innovation effectively.

Innovation strategy

The results showed that innovation strategy with a path coefficient of .231 (p <.001) positively affects innovation management effectiveness. This explains that the awarded organization has the determination to create innovation and to be an innovative organization by defining innovation in terms of vision, mission, strategies, and innovation goals. Moreover, the strategy creates a direction for the whole organization to have clear goals and to follow directions. The organization also has communicated strategies and innovation goals that all employees can recognize and clearly understand. Consequently, the employees will know the organization's direction and can achieve its goal.

Organizational culture

The results showed that the organizational culture with a path coefficient of .254 (p <.001) positively affects innovation management effectiveness. All of the organizations that have received an innovation award create an organizational culture that supports innovation development. An organizational culture is a way in which employees perceive, think, and react within the organization, for example, creating innovation as a shared value for shaping employees' perceptions and behavior.

The organization also establishes structures to stimulate and promote innovation by creating a flexible work culture and decentralization. Shared values are transmitted through the structure in terms of team building and cross-functional teams. In this way, the employees can manage their time correctly and can be inspired and creative. The results showed that the organizational culture had a positive effect on organizational structure (β =.477, p<.001).

Organizational Structure

The study found that awarded organizations have a similar organizational structure; this shows that the organization does not have a flat organization. However, the organizational structure facilitates innovative work by establishing a special unit or

cross-functional team with knowledge and expertise in various fields to co-create innovation. Furthermore, the quantitative results illustrated that the organizational structure with a path coefficient of .278 (p <.001) positively affects innovation management effectiveness. This explains that the awarded organizations have an appropriate organizational structure and facilitate innovation by empowering them in innovation development projects. Thus, employees have more freedom to decide and control their activities, facilitating creative ideas in product and service improvement.

Human resource management

The results showed that human resource management practice with a path coefficient of .225 (p =.017) positively affects innovation management effectiveness.

Regarding recruitment and selection, the organization screens candidates that qualify for job responsibility and look for a candidate that has the creativity skills to join the innovation team.

The organization supports training and development inside and outside the organization to enhance employees' knowledge and skills necessary to increase creative ideas and innovation development.

In performance appraisal, all organizations have introduced innovation as part of the performance evaluation. The awarded organization defined employees' capability to create innovation as a criterion for performance appraisal to motivate employees' creativity and behavior to develop innovation.

Regarding rewards and recognition, the organizations reward successful innovation projects, but the rewards may not only be extrinsic rewards, such as pay incentives, bonuses, benefits, and career advancement. They can also be intrinsic rewards such as increased freedom and making employees enjoy working on

assignments. Thus, rewards and recognition can positively impact encouraging innovation to encourage and motivate employees in innovative work.

Organizational system

The results showed that an organizational system with a path coefficient of .202 ($p < .001$) positively affects innovation management effectiveness.

The organizations that have been awarded for innovation have a communication system conducive to innovation, especially the organization's communication system with various channels such as journals, email, web-boards, websites, and social media platforms. Furthermore, the organizations also set a forum for communication from management to employees and among different units to share knowledge and innovation development experience.

In terms of resource management, the public sector's resources support will have to plan by writing project proposals for funding and committee consideration. Thus, the contribution of resources, whether in terms of money and or equipment, is already in the approved plan. However, when employees need additional support during the innovation process, additional requests can be made, considering the importance of additional resources. When employees recognize sufficient support while developing innovative ideas, they will be motivated and encouraged to work.

In terms of knowledge management, the results showed that organizations focus on knowledge management to share knowledge and experience both in success and in innovation development failure. The organization supports knowledge management by developing channels within the organizations to share its knowledge with others so that it facilitates collaboration in the innovation process, for example, via documents, forums, coaching, social network platforms, and websites. Thus, having a good knowledge management system will help spread knowledge throughout the organization and encourage employees to learn and build their innovative work.

5.2 Discussion

The results of the research are discussed as follows.

5.2.1 The characteristics of the awarded organization

5.2.1.1 Organization innovation management

Organizational innovation management, including improving products, services and adjusting work processes, must spread throughout the organization from the management level to the operational level in order for innovation to become part of the work routine. The research results also indicated that the organization had improved the overall performance when innovation is part of organizational management. The innovation organization's characteristics will consist of innovative, visionary leadership that plays a crucial role in leading the organization by providing a clear approach to innovation through organizational strategies. The leader also encourages new idea generation by providing individuals with the freedom to try new things by challenging them to engage themselves in the entire innovation process. Moreover, the leader has active communication for innovation and creativity, motivating through shared vision, and with support of the resources needed for innovative activities. This is consistent with the work of Jabbar et al. (2017), who stated that the leader has the responsibility to stimulate employees to produce creative knowledge and solutions and to create motivated teams to find ways to implement the innovation process (Jabbar & Hussein, 2017). Sultana (2012) suggests that an innovative leader's character should lead by generating creative ideas and approaches for finding solutions; another role is leading others by leading the innovation team and facilitating the essential resources (Sultana & Rahman, 2012). Furthermore, the leader that is more flexible is best prepared for immediately responding change that can lead the organization to be successful in innovation management (Thomas, 2007).

Focusing on strategy is one of the important aspects of organizational innovation management. The awarded organization has innovation strategies to encourage advancement in services by focusing on research and development. This help organization to improve productivity in public services. Innovation is a crucial element of the organization’s strategies to improve the quality of services and its positive image. Moreover, innovation strategies are one of the outstanding characteristics that consider the impact on innovation performance in setting up a sense of direction, increasing operational efficiency, and generating new ideas. This is

consistent with Mintzberg et al. (2009), who indicated that strategy is an essential instrument for creating the direction of the organization by promoting coordination in providing employees with an easy way to understand the organization and to provide consistency and reduce ambiguity (Ahlstrand, Lampel, & Mintzberg, 2001). The innovation strategy is considered as a critical requirement for the growth and superior performance of each organization (Kiptoo & Koech, 2019). Polder et al. (2010) also stated that the organization that adopts an innovation strategy can increase its product and service development efficiency (Polder, Van Leeuwen, Mohnen, & Raymond, 2010). Moreover, Pakdeelao (2011) pointed out that the awarded organization is characterized by clear innovation goals reflected in its vision, mission, and strategies and can communicate these to all employees for their perception and understanding (Pakdeelao, 2011). Snyder and Duarte (2003) suggested that organizations that focus on innovation should focus on setting a clear and feasible vision related to innovation and establish innovative strategies and goals so that all of the organizations' members can take part in the responsibility for innovation (Snyder & Duarte, 2003). Rogers and Christensen (2001) also suggested that innovative organizations should have long-term strategy related to innovation as it helps with organizational management to promote and encourage new ideas, including the allocation of resources to create innovation and this results in employees with innovative thinking (Rogers, 2001).

According to the research results, organizations value the freedom of innovation development by supporting teamwork to work with agility. The organization encourages employees to participate in the development of innovation continually. Thus, the team members can exchange ideas openly, and this type of work is flexible and responsive to change. Furthermore, the organization that creates a shared learning environment and, innovative routines take innovation as part of its routine work. The awarded organization also has an innovative culture that creates values for people to be dedicated to goals by creating idea generation, concentrating on integrating or adapting existing ideas to push employee to think outside of the box, to engage in knowledge sharing, and keeping their skills and ability up to date. This is in line with Martins and Terblanche (2003), who indicated that encouraging employees to create new ideas is part of a culture that can promote creativity and

innovation (Martins & Terblanche, 2003). Creating an atmosphere that promotes organizational learning is critical to innovation, focusing on employees' involvement by supporting teams or cross-functional teams, and by providing the freedom to work (Bessant, 2015). Furthermore, the innovative organization has the to create and apply the necessary new knowledge to innovative activities (Lam, 2011).

5.2.1.2 The employee’s potential in innovation management

Fostering creativity and experimentation requires people to have the necessary skills and appropriate confidence. Therefore, the awarded organization emphasizes long-term human skills development and training strategies, and the organization must develop and instill learning habits of employees in the organization. In addition, employees have the opportunity to meet with others both inside and outside the organization in the form of work or cross-functional and network collaboration that allows employees to obtain the knowledge and skills that are up to date and to have creative skills. Promoting teamwork can increase the competence of employees in terms of knowledge, opinions, and perspectives to develop novel solutions to the demands and problems that the organization faces. This is consistent with Sherwood (2001), who stated that human development support is also critical for fostering innovation in the organization, such as organizing workshops to increase knowledge and skills in innovation development (Sherwood, 2001). Dundon (2002) stated that innovative thinking is a skill that can be taught, practiced, and improved; if team members have the skills, they will have the confidence to find and develop new ideas at total capacity. Therefore, the development of innovation skills aims to develop the innovation to become the organization's core competence (Dundon, 2002). Organizations support training and development to master the basic work skills required to perform the employees' duties and to encourage organizational performance (Dessler, 2019). The National Innovation Agency (NIA) suggested that employees must be the center of innovation development in promoting innovation; thus, employees must be encouraged to have strong innovative skills and be encouraged to use those skills (National Innovation Agency, 2003). Encouraging the integration of ideas from different units, creating a network with universities, and

hiring consultants will encourage the organization to create new perspectives and develop innovative ideas (Luecke, 2003).

In addition, the awarded organization focuses on the employees' development in terms of competency development both in terms of core competency and functional competency to support the development of innovation. Employees are developed to have innovation competencies, namely knowledge, skills, and attitudes that support innovation, by using the knowledge management system as a tool to drive tacit and explicit knowledge. The creation of innovation capability allows the organization to leverage the organization's performance in creating new ideas in solving problems and developing new services. The organization supports knowledge management both inside and outside the organization creating a favorable environment for individuals to use and share their expertise and knowledge and to create new knowledge. In this way, employees will have more skills, experience, competence, and motivation for innovative work. The organization with a good support system for knowledge exchange, whether from successful members within the organization or cooperation with external agencies, supports continuous innovation development and organizational performance. This is consistent with the ideas of Choi and Lee (2003), who stated that knowledge management is a characteristic of innovation organizations for developing organizational performance (Choi & Lee, 2003). Knowledge management is considered the best tool in the creative process that is often difficult to replicate; thus, employees in the innovation organization actively share information and knowledge to share the best practices for spreading knowledge across the organization (HPO Center, 2021). In addition, Villa et al. (2014) indicated that knowledge management is an essential tool for promoting employee competency in innovation in terms of skills, knowledge, and attitudes that will result in innovation management effectiveness (Vila, Perez, & Coll-Serrano, 2014).

5.2.1.3 The competence of public service

The public sector operates under pressures and restrictions; as a result, the work processes are complex, obsolete, and ineffective. Therefore, innovation comes changes the public sector in terms of new dimensions of performance. Therefore, the organization's development to be an innovative organization results in

more efficient work results and can deliver quality and new services. Furthermore, the organization has been recognized as a modern and high-performance organization. According to research results, the organization adopts new ideas from systematic thought and needs analysis regarding the service users in order to develop new services and products. Furthermore, the organization integrates organizational management capabilities, including creating interactions with people in creating service values in order to increase convenience and speed of access in public service. This is consistent with the institution theory, which indicates that the environment forces organizations to be modified in order to increase their compatibility with the environment.

The organization needs to change its strategies, structures, and activities to survive in the external environment (Avgerou, 2001); DiMaggio, 1983). Innovation development is one of the instruments that can help organizations adapt to change and increase their competitive advantage. Thus, the organization adopts new technology and practices to develop products and services to achieve the organization's performance and to respond to the environment (Liao, 2018). Innovation organizations are different from other organizations that can regularly develop new products or services (Youngsuksathaporn, 2009). Yodyingyong (2009) indicated that in order to change the organization to an innovative one, it must modify its characteristics or organizational behavior to develop good quality products and services (Yodyingyong, 2009). This is also consistent with Lawson and Samson (2001), who stated that an organization with high-performing innovation management is able to maintain competence continuously and to bring new quality products or services to the people more frequently (Lawson & Samson, 2001). Moreover, effective innovation management results in the development of the organization towards being a high-performance one. Waal (2007) stated that an organization with constant productivity and innovation is another characteristic of a high-performing organization (De Waal, 2007).

The awarded organization attaches great importance to research and development to produce innovative work that develops and solves current problems and supports future changes. The organization supports research and development as

the primary mechanism driving the creation of innovation, as can be seen from the strategic plan that clearly identifies innovation and the results that will be achieved. As a result, these organizations have an increasing number of innovations that occur each year, and the innovative products have quality and efficiency in solving problems and improving work. Innovation has become an integral part of the organization, so employees recognize that innovation is essential and strive to develop organizational innovation continuously, and this results in a greater number of innovations that can be submitted to national and national contests and can lead to commercialization and patents. This is in line with the notion of Kim and Castillejos-Petalcorin (2020), who stated that the public organization supports research and development to promote innovation that contributes to advancing productivity (J. Kim & Castillejos-Petalcorin, 2020). Verbeek and Lykogianni (2008) also indicated that research and development related to outputs such as publications and patents are essential sources of innovation (Verbeek & Lykogianni, 2008). The efforts of the public organization to sustain innovation and accelerated commercialization can lead to new opportunities for innovation (David, Hall, & Toole, 2000). Furthermore, research and development in public organizations reduce the risk of uncertain outcomes and increase innovation capacity (J. Kim & Castillejos-Petalcorin, 2020).

5.2.2 The determinants fostering innovation effectiveness in public service in the awarded organization

5.2.2.1 Innovative Leadership

The quantitative results showed that employees perceived that innovative leadership was consistent with a high level of innovation management effectiveness (mean=4.66). The path analysis results revealed that innovative leadership had no direct effect on innovation management effectiveness (β=.350, *p=.114*). However, innovative leadership had an indirect effect on innovation management effectiveness through innovation strategy (β =.211, *p=.021*). This shows that the leader fosters innovation through organizational strategy; the leader creates a strategy that is like a roadmap of the organization that leads to success. Moreover, the leader has a clear strategy to determines an organization’s need for innovation, with

all employees involved in implementing innovation policies. In particular are the strategies related to research and development, technology, and innovation to drive current and future work and to develop the products to the commercialization stage. The qualitative results also confirm that an organization with visionary leadership will lead to success in innovation management. This shows that the leader that has a decisive role in innovation management by setting directions via visions, missions, and strategies can engage the employees to achieve innovative goals. Having a research and innovation strategy and actively following the implementation of the strategic plan results in the success of innovation development.

The research results are consistent with previous research, which shows that innovation management must consider part of the organization's strategy to support the innovation management process (Bouhali et al., 2015). Soken and Barne (2014) also stated that the leader should incorporate innovation in its vision, mission, and strategy because this will help all organization members have a common definition of innovation so that they can combine their work routines with the innovation (Soken & Barnes, 2014). Furthermore, Olaru et al. (2016) stated that the leader's action in fostering innovation includes future strategies and energizing employees to achieve goals (Olaru, Schmid, Sârbu, & Maier, 2016). Tidd and Bessant (2011) also suggested that the innovation strategy determines the leader's potential in managing innovation because the organization has a different innovation potential that depends on the organization's direction from the leader (Bessant et al., 2011).

The obtained qualitative results are similar to the quantitative results which show that innovative leadership is not limited to the top management but should be present at all levels of the organization. The leader at every level has the role of supporting innovation and includes picking the right teams for innovative activities, using the right facilitators, and distributing ideas throughout the organization for future use. In terms of the responsible innovation strategy, the leader at every level has a different role in strategy implementation, fostering successful innovation development according to the strategic plan. This is in line with Horth and Vehar (2015), who indicated that functional leaders are responsible for developing an innovation strategy and controlling the innovation process and new products, and

middle managers act as a connector for supporting innovative teams and facilitating cooperation between workgroups (Horth & Vehar, 2012). Kozioł-Nadolna (2020) also suggested that the leader at all levels must be competent in supporting innovation to take a new approach to leadership, such as building commitment, being innovation-oriented, passion invoking, and focusing on employees as strategic resources (Kozioł-Nadolna, 2020).

In addition, the research results also showed that innovative leadership indirectly affects innovation management effectiveness through organizational culture (β =.144, $p<.001$). This is consistent with the qualitative results, which showed that the leader focuses on creating a culture that promotes organizational innovation. The leader creates shared values of innovation in order to encourage employees to believe that innovation is vital in organizational development. The leader influences the organizational culture by inspiring employees with a shared vision and mission to engage team members and to encourage them to bring their skills and abilities to achieve innovative goals. A leader that focuses on inspiring employees with a shared vision, mission, and values can engage employees to bring all of their skills and energy to achieve the innovative goals. The leader is committed to managing the culture in order to develop and sustain organizational capacity because innovation management success is the management level's primary responsibility. This is aligned with Elenkov and Manev (2005), who indicated that the innovation organization needs a leader that can change the culture and develop an innovation culture by empowering employees to initiate and share ideas to commit to achieving goals (Elenkov & Manev, 2005). Maher (2014) also stated that a leader has a vital role in strengthening innovation culture, and the leader will take part in every step in supporting such a culture (Maher, 2014). The leader influences an organization's ability to connect to the fast-changing environment by creating a sustained innovation culture (Soken & Barnes, 2014). Ceauşu et al. (2017) suggested that a thriving innovation culture depends on the leader's role in creating a culture in which innovation and creativity are everyone's work (Ceauşu, Murswieck, Kurth, & Lonescu, 2017).

The quantitative results are consistent with the qualitative results which showed that the leader believes and raises awareness of employees so that they can recognize the importance of change in terms of work improvement to adapt to change. The more flexible and better-prepared leader in responding to change immediately shapes a responsible relationship with the organization's immediate and remote environment. This is consistent with Koziol-Nadolna (2020), who stated that the role of the leader has changed, especially in terms of managing innovation because the leader is not performing only managerial functions; the leader should have leadership tasks such as motivating and inspiring employees to cooperate in innovation development (Kozioł-Nadolna, 2020). The leader must be competent in supporting innovation to take a new approach to leadership and to abandon traditional stereotypes; for example, the ability to initiate change recognizes future opportunities and threats and build commitment (Thomas, 2007).

Moreover, the qualitative research results indicated that leader has the competence to manage risks arising from creating innovation because creating a risk-taking culture and one that is open to the possibility of failure and to be able to discover something new are the roles of a leader in innovation management. This is in line with the quantitative results, which indicated that the leader dares to take risks and accept the failure that might occur. It shows that innovation is impossible to achieve without taking a necessary amount of risk. The leader in public organizations is trying to find a way to develop innovation based on minimal risk. However, the leader supports the risk-taking culture in order to motivate employees to research and develop new products and services. The encouragement to take risks encourages employees to think "outside the box" and motivates them to participate in innovation development. This is consistent with Thomas (2007), who stated that the leader has the role of accepting uncertainties, risks, and failures, combined with the ability to teach teams to draw conclusions and to gain experience for the future (Thomas, 2007). Maher (2014) also indicated that leaders should accept mistakes in the innovation process because mistake tolerance is one of the elements of the culture that demonstrates leadership qualities (Maher, 2014). This is in line with Ceauşu et al. (2017), who stated that the critical characteristics of the high performance of the organizational culture in innovation are creating a culture of risk-taking and learning

from failures (Ceauşu et al., 2017). Supporting risk-taking will decrease the impact of barriers to creativity and innovation; thus, organizations should move toward greater innovation and more intelligent risk-taking (Barnes and Conti, 2014).

5.2.2.2 Innovation strategy

According to the quantitative research results, it was found that innovation strategy positively affected innovation management at a significance level of 0.05 (β =.231, *p<.001*), and employees perceived that innovation strategy was consistent with a high level of innovation management effectiveness (mean=4.70). This shows that innovation strategy is important for innovation development because it helps the organization have a clear target direction that contributes to efficient operations. The innovation strategy also helps the employee to understand the organization's goals and directions in implementing innovation. Moreover, strategy enables employees to understand the organization's overall needs and current innovation management capabilities, enabling employees to operate and use resources effectively to manage innovation. This result is in line with previous research, which suggested that an organization that applies innovation to visions, missions, and strategies can improve the level of innovation (Hornsby et al., 2002). The benefit of the innovation strategy is to increase the organization's performance because the innovation strategy is suitable for uncertain development and rapid technological change (Zhou, 2006). Furthermore, a good innovation strategy promotes the alignment of diverse groups and focuses on organizational goals (Pisano, 2015). Wu and Lin also indicate that innovation strategy is a variable with a substantial effect on innovation quality (Wu, Shwu-ing & Ling Lin, 2011). This is consistent with Kariuki (2014), who found that innovation strategy has a strong and positive effect on organizational performance because the innovation strategy is related to products, processes, and services (Shisia et al., 2014).

According to the present study, the present awarded organization has defined innovation in terms of vision, mission, or strategy, which are the first steps to show that executives demonstrate the willingness and confidence in making

innovations. The results of this research are consistent with previous studies that suggested that innovation strategy affects the effectiveness of the innovation performance of the public organization (Collm & Schedler, 2014; Hartley et al., 2013; Manimala, Jose, & Thomas, 2006; Moussa, McMurray, & Muenjohn, 2018). Successful innovation performance requires an innovation strategy for the creation of value by using converting new ideas into products and services. The innovation will generate public value and create new things that will serve people better than before. This result is in line with previous research, which suggested that the innovation strategy used to deal with major intended and emergent initiatives enhances organizational performance, especially in dealing with external environments (Nag, Hambrick, & Chen, 2007). Andrews et al. (2006) suggested that innovation strategy is the route to high organizational performance levels in the public sector (R. Andrews, Boyne, & Walker, 2006). Jimenez and Sanz Valle (2011) also suggested that when the organization uses the right innovation strategy, it can help the organization with sustainable organizational performance, reduce production costs and increase people's satisfaction in receiving services (Jiménez-Jiménez & Sanz-Valle, 2011).

In addition, the quantitative results are in line with the qualitative results, showing that innovation strategy is a critical factor in promoting innovation. The effective organization in implementing innovation pays great attention to strategy formulation involving innovation, as seen from a vision and mission that focus on innovation. Strategy formulation provides administrators and staff readiness to understand the organization's potential and to influence organizational factors. The awarded organization has the current vision, mission, or strategy plan to emphasize innovative development. Thus, the employees will understand and can work in the same direction. According to the research results, it was found that an effective innovation strategy drives collaboration and success in the innovation process because it helps employees to understand, recognize the importance of, and be able to implement the innovation. In addition, the organization has a strategic plan that shows a strong commitment to innovation management. This is consistent with Preda (2013), who indicated that the organization that defines innovation in its organizational strategies will have a high level of innovation performance due to the calculation of risk-taking and analysis of changes (Preda, 2013). Doujak and Moeller (2008) also

have indicated that the organization that focuses more on formulating strategic innovation and that integrates with it the core mission can create sustainable growth (Moeller, STOLLA, & Doujak, 2008).

The obtained quantitative results are similar to the quantitative results which showed that the awarded organization has converts innovation strategy into action plans to encourage employees to recognize the importance of innovation and to have a clear guideline in implementing innovation. The action plan enables employees to understand the organization's overall needs, enabling them to operate and use resources effectively to manage innovation. This is consistent with Martensen and Dahlgaard (1999),who indicated that action plans that are converted from innovation strategies must be cascaded through the organization in order to create participation and coordination at all levels and with all functions (Martensen & Dahlgaard, 1999). The action plan detailing how the organization should work according to the innovation strategy that defines the achievement goal and innovation development approach can encourage employees to achieve the organization's goals (Wood, 2007).

In addition, according to the research result, strategic monitoring is important for implementing innovative projects. This ensures that employees will act according to the plan and ensures that the innovation development results are aligned with the objectives intended in order to achieve the innovation development goals. The qualitative results show that the awarded organization has a division responsible for controlling, monitoring, and facilitating the implementation of the strategy. This support will enable each division to continuously implement the following organizational strategies and provide information and suggestions during the innovation process. This is consistent with Rolik (2013), who indicates that strategic monitoring and evaluation impact the innovation goals that show the progression, potentials, problems, and barriers of implementing innovation following the strategy (Rolik, 2013). Hittmar et al. (2015) also indicated that strategy evaluation can be applied to accessing innovation strategies in order to find opportunities to succeed, create innovative ideas, and fix problems on time when errors occur (Hittmar, Varmus, & Lendel, 2015)

5.2.2.3 Organizational culture

Based on the research results, the employees perceived that the organizational culture was consistent with a high level of innovation management effectiveness with a mean of 4.72. The path analysis results showed that organizational culture positively affected innovation management effectiveness at a significance level of 0.05 (β =.254, $p<.001$). The results indicated that an innovation culture is simply an organizational culture that values and supports innovation to make the innovation happen throughout the organization. Organizational culture is essential for promoting innovation in the organization because it is how employees perceive, think, and behave within the organization. Based on the research results, the employees recognized the importance of innovation when an organization promotes the innovative culture. The culture changes their beliefs, perceptions, and behavior, and this promotes creative ideas to be applied to innovative projects. This is in line with the concept of the innovation culture of Nieminen (2018), who indicated that if the organization does not value innovation, the employees will not recognize innovation as something important that the organization needs (Nieminen, 2018). Moreover, accepting different opinions from different experiences is also critical in creating the innovation culture in order to increase creative problem solving, collaboration, and innovation. This is consistent with Sylvia et al. (2013), who stated that accepting diversity can establish a culture that employees feel free to contribute their ideas (Sylvia, 2013). The different ways of doing things, opinions, and different experiences that the members share in the innovation process can build creative activities and affect innovation development (Pratt et al., 2015).

In addition, the quantitative results showed that the organization that defined innovation as shared values affects the effectiveness of innovation implementation. Shared values encourage employees to focus on innovation, so it is important to find these values that will create innovation and build it into the organizational culture. This is similar to the qualitative results, showing that shared values encourage employees to be aware and participate in the innovation goals in developing innovative products and services. Moreover, creating shared values in an innovative organization requires employees to have confidence in their ability to innovate. Shared values will encourage employees to feel confident that they can carry out their

tasks. This is consistent with Lowe and Dominiquini (2006), who found that the organizational culture and values have an essential role in implementing innovation effectiveness (Loewe & Dominiquini, 2006). Dvir, Kass and Shamir (2004) also indicated that shared values are a strong aspect of the culture that connects employees through common goals and motivates them to be passionate to be successful (Dvir et al., 2004). The values associate with visions will lead to practical organizational commitment. Moreover, vision can connect employees in change and show innovation potential.

The organization can also develop a continuous learning culture by supporting formal and informal channels to encourage the exchange of innovative thinking and behavior. Organizations can drive employees to recognize innovation formally as shared values are defined in their vision, mission, strategy, and even KPIs. On the other hand, fostering an innovative culture can be transmitted in an informal way by small group meetings that allow people that work on innovation or are interested in innovation to have a space for discussing and exchanging knowledge and experience. This is consistent with Trammel (2014), who showed that employees can learn a lot from attending meetings with other departments (Trammell, 2014). The belief of shared values concerns not what the leaders say or the organization's material and reports, but it depends on what the leader does to encourage people to engage with shared values (Ceauşu et al., 2017). Bolton (2013) suggests that successful organizations show that they develop an organizational culture where innovation is the responsibility of employees at all levels in their daily work (Bolton, 2020). The organization should support employees in being open to new ideas and being prepared to participate in innovative projects by support creativity actively and showing the initiative that develops the innovation potential (Ceauşu et al., 2017).

According to the quantitative results, risk acceptance had the lowest mean (mean= 4.60) compared with other organizational culture constructs. This is in line with the qualitative results, which showed that the public sector accepts the low risks and decisions based on thorough risk assessment because the budget mainly comes from taxes. Therefore, innovation development must be carefully assessed and take low risks so as not to waste the budget. These research results are consistent with

Deana (2019), who pointed out that it is important to have a thorough risk assessment in order to help organizations lower the risk of making wrong decisions throughout the entire innovation process (Deana, 2019). Janošková and Kráľ (2016) also pointed out that accepting risk is the willingness to consider carefully and showing the ability to make risk assessment decisions (Janošková, 2016). If the error from making a mistake can be accepted and the risks do not harm, the organization will allow employees to lessons together in order to avoid making the mistakes again. Through the preparation of the innovation process, it is possible to minimize the risk of failure, but it is impossible to avoid it completely (Janošková & Kráľ, 2016). Martins and Terblanche (2003) also indicated that mistake handling is critical for innovation management; it demonstrates the effective risk management that enables employees to interpret the mistake as a learning opportunity (Martins & Terblanche, 2003). Demontigny (2021) suggested that innovation progress and success require continuous risks management because it is always better to be proactive and manage risks regularly in order to prevent the occurrence of errors (Demontigny, 2021).

According to the research results, organizational culture positively affects the organizational structure with a significance level of 0.05 (β =.477, $p<.001$). The organizational culture impacts the organizational structure both through its design and its implementation. The culture creates a frame of reference in which the organization management's considerations and reasoning circulate in decision-making concerning the organizational structure. This is in line with Ostroff et al. (2013), who pointed out that the organizational culture impacts the organizational design by forming the top management's interpretative schemes and selecting the organizational structure model (Ostroff et al., 2013). The culture influences the employees' tasks, and their interactions with others and decisions (Janićijević, 2013). A culture that supports innovation supports values such as freedom, work teams, and flexibility. It will promote innovation, whereas specialization, control, formalization, rigidity, standardization, and centralization will inhibit innovation (Arad et al., 1997; Martins & Terblanche, 2003).

In addition, the quantitative results are consistent with the qualitative results which showed that the organization that supports a teamwork culture will allow

employees to share a belief in collaboration; it provides synergy the to work done. Such a culture can quickly build trust, get together as a team, and help achieve a much higher quality of innovative products and services. Moreover, teamwork allows employees to broaden their knowledge to improve their performance and handle complex tasks. The innovation begins with combining different perspectives in problem-solving and experimentation. Working in groups or teams allows creativity and more flexible solutions than when only one person is working. Therefore, creating innovation that focuses on teamwork, such as cross-functional teams and project teams, can foster innovation effectiveness. This is in line with the ideas of Arad et al. (1997) and Martin and Terblanche (2003), who indicated that a culture that supports innovation are values, freedom, work teams, and flexibility, whereas control, rigidity, and centralization inhibit innovation (Arad et al., 1997; Martins & Terblanche, 2003). Maccurtain et al. (2010) also stated that teamwork contributes to the knowledge sharing and learning process because it easier for members to strengthen each other's knowledge and enhance knowledge creation (MacCurtain, Flood, Ramamoorthy, West, & Dawson, 2010).

5.2.2.4 Organizational Structure

The research results showed that the organizational structure positively affects innovation management effectiveness with a significance level of 0.05 (β=.278, $p<.001$). Employees perceived that organizational structure was consistent with a high level of innovation management effectiveness with a mean of 4.89. These quantitative results are aligned with the qualitative results, which showed that the successful innovation organization has a decentralized structure to foster knowledge development through the research process and development. The awarded organization is not "flat," but it uses a decentralized system with the innovation development team to support flexibility and agile in the innovation projects. The decentralized organization shows a flexible organizational structure provides informal coordination and encourages creativity and knowledge sharing. Moreover, it demonstrates the distribution power that comes from trust between the leader and employees. Thus, the employees have the freedom to be creative innovation. This is in line with Burns and Stalker (1994), who stated that flat, decentralized, and flexible

organizations can be a catalyst for innovation (Burns & Stalker, 1994). The delegated and coordinated organizational structure impacts information flow and exchange of ideas to support the generation and experimentation of innovative products or services (Dekoulou & Trivellas, 2017). Decentralization provides empowerment and participation to respond to the environment in order to improve the employees' ability and to apply knowledge and experience for better innovation performance.

However, the qualitative results showed that the organization also uses a centralized system for driving innovation. Sometimes, an organization uses a centralized approach in terms of information flow from top to bottom through a hierarchical organizational structure. Moreover, centralization is applied to push employees to initiate innovations and to find solutions to resolve problems urgently. Centralization also applies in the case of an organization that wants to develop new products. It shows that the organizations use the centralization approach to promote the consensus of rules and regulations and to clarify strategic orientation when the organization innovates. This is consistent with Mintzberg (2015), who indicated that the organization focuses on control-oriented with high centralization to manage a quick responses to environmental change (Mintzberg, 2015). Zollo and Winter (2003) also indicated that centralization fosters the generation of ideas and suggestions favoring enhancing organizational routines and it can strengthen idea generation in the innovation process to achieve standardization (Zollo & Winter, 2003). Cowan and Cowan and Jonard (2004) also suggested that formalization promotes knowledge creation when an organization receives new knowledge that influences transformation into innovation (Cowan & Jonard, 2004). It can be concluded that the appropriate organizational structure in fostering innovative organizations will not have a specific style. Tidd et al. (2001) suggest that organizational structure that fits the organization's innovation does not have an exact model; it depends on the organization's innovation approach because its different structures are suitable for the organization's innovative approaches (Tidd, 2001).

The obtained research results, both qualitative and quantitative, also showed that the organization uses a cross-function team or adhocracy to have experts to work on the same team in order to integrate diverse ideas and experiences so that the

individuals can work together. Cross-functional teams are conducive to innovation development because the employees can contribute their knowledge and experience with the members to work together to complete tasks and accomplish goals. The organization creates ad-hoc teams to be highly resilient, relatively few rules and official procedures are focused on decentralization. This is consistent with the concept of contingency theory, where the innovative organization requires flexible management and an organic structure to deal with uncertain environments (Burns & Stalker, 1994). This structure reacts to various situations or conditions by developing the most suitable management approach (Liang & Lu, 2013). Un and Cuervo-Cazurra (2004) have shown that teamwork supports employees in bringing different perspectives and sharing ideas among team members that allowed new ideas to be explored (Un & Cuervo-Cazurra, 2004). Teamwork is also considered a structure that encourages lateral communications and linkages for sharing ideas and discussion by linkage across teams to be implemented in cross-functional teams and integrated teams (Damanpour, 1991; Mohrman, Tenkasi, & Jr, 2003). The organization also supports expertise in terms of different functions so that workers can participate in innovation projects that will bring about various concepts, knowledge, and experience be applied in the job responsibility. This is in line with Boschma and Weterings (2005), who stated that organizations are more productive in innovation when they have specialists on the team (Boschma & Weterings, 2005). Organizations can specialize in complex innovation because they need more specialists for new solutions (Baldridge & Burnham, 2006; Damanpour & Gopalakrishnan, 1998). Baldridge and Burnham (2006) also suggested that organization can find new solutions and initiate new innovative products and services to achieve goals and to promote innovation when applying specialization in specialized tasks (Baldridge & Burnham, 2006).

5.2.2.5 Human Resource Management Practice

Based on the research results, human resource management practice was seen to positively affect innovation management effectiveness with a significance level of 0.05 (β =.225, *p=.017*). Employees perceived that innovation strategy was consistent with a high level of innovation management effectiveness with a mean of 4.62. Human resources management practices play a crucial role in innovation because

human resource management is relevant to managing people that participate in innovation management. In every organization, human resource management practices are employed in preparing, promoting, and developing human resources to develop organizational innovation. Human resource management is a guideline whereby an organization shapes employees' skills and behavior to achieve innovation development goals. This is in line with the concept of human resource management practice of Boxall and Purcell (2011), which shows that people are the heart of creativity and innovation in developing ideas and putting them into practice in order to succeed in organizational development (Boxall & Purcell, 2011). Datta et al. (2005) also stated that human resource management practice has significant implications regarding innovation development in changing the work form and linking with organization performance (Datta, Guthrie, & Wright, 2005).

Recruitment and Selection

Recruitment and selection are the processes that look for people with expertise in this area. It may not be directly identified as innovation but requires background knowledge and qualifications in order to bring about innovation. The organization finds people that specialize in their job responsibilities and have the personality and attitude that can work with teams. This is consistent with Jennie (2013), who indicated that the recruitment and selection method helps the organization find employees that have appropriate performance, attitude, and skills that will enable the organization to combine these characteristics to stimulate innovation (Jennie, 2013). Jiang et al. (2012) also indicated that recruitment and selection can screen the people that have the skills, task expertise, and motivation necessary for creativity (Jiang et al., 2012). According to the qualitative results, public organizations sometimes recruit talented people from government scholarship students, allowing the organization to obtain people with high potential to work in the organization. This is in line with Wang and Wang (2012), who indicated that a successful organization establishes a recruiting system to find new talent and creative employees (Wang & Wang, 2012). Recruiting talent is challenging, but the organization must recruit them as part of effective innovation management (Breaugh, 2009).

Job design

Job design is a human resource management tool that creates a supportive and stimulating work environment that enhances innovative work behavior. The obtained quantitative results are consistent with the qualitative results, which showed that the awarded organization provides autonomy, employee interaction, and complexity in creating the potential for innovative management. Job design strives to organize the tasks, duties, and responsibilities associated with achieving organizational and individual objectives. Thus, the organization attempts to design jobs to increase employee access, comfort, and flexibility is likely to influence individuals' motivation and organizational performance. This is consistent with Holman et al. (2012), who stated that job design affects employee innovation in promoting their performance to achieve multiple beneficial outcomes (Holman et al., 2012). Job design is related to employee innovation, the individual-level process by which new ideas are generated, promoted and implemented within organizations (Rank, Pace, & Frese, 2004; Van de Ven, Angle, & Poole, 2000). Providing employees with freedom determines the steps to take in their jobs and will increase the likelihood of being willing to put them into action in their job. The organization encourages participation by providing the freedom to select the method of working on the innovation project. This is in line with Shalley and Gilson (2000), who pointed out that job autonomy is positively related to creativity and innovation (Shalley & Gilson, 2004). Burcharth et al. (2017) also indicated that the activities that promote autonomy, including freedom in work, allowance of time for creativity, and supporting a work-life balance, are the mechanisms that enable the organization to increase its innovation performance (Burcharth, Knudsen, & Søndergaard, 2017). Furthermore, Globocnik and Salomo (2015) stated that the organization with freedom in work can carry out innovative activities without supervisory control of all of the innovation processes (Globocnik & Salomo, 2015). Thus, employee autonomy is a crucial aspect of job design that is positively associated with creativity, intrinsic motivation, and proactive role orientation (Fini, Grimaldi, Marzocchi, & Sobrero, 2012; Foss, Minbaeva, Pedersen, & Reinholt, 2009).

Training and Development

Training and development also stimulate employees to develop initiatives and problem-solving skills and to apply them in their professional job. The focus on

training affects innovation development in the organization. Organization support budgets to encourage employees in training and development both inside and outside the organization. This is in line with Lau and Ngo (2004), who stated that training and development enhance the employees' knowledge and skills, which are necessary to increase the creativity that can be applied in task expertise (Lau & Ngo, 2004). Hunter et al. (2007) also suggested that training in problem-solving skills will stimulate great ideas to develop innovative products and services (Hunter, Bedell, & Mumford, 2007). Therefore, the organization should develop the necessary innovation skills and promote the learning habits of employees (Tidd, 2001). The qualitative results are similar to quantitative results, which showed that the organization supports training inside and outside the organization. The organization organizes internal training programs by employing specialized consultants to train employees in innovation or related areas. This shows that the organization encourages continuous development in order to increase the potential of employees. This is in line with Shalley and Gilson (2004), who stated that the support training inside and outside the organization can increase employees' knowledge of creativity and so that they can be more creative (Shalley & Gilson, 2004).

Furthermore, the organization builds a network with the private sector or other government agencies to exchange knowledge and experience, promote continuous knowledge development, promote innovation development, and help the organization succeed in innovative development. In addition to training, providing further education opportunities is important because it increases the employee's knowledge and they can use that knowledge in their professional job development. This is consistent with Jiang et al. (2012), who stated that the high-performance organization increases its knowledge base and encourages employee training, and supports the pursuit of higher education (Jiang et al., 2012). Bauernschuster et al. (2010) also suggested that continuous training guarantees access to knowledge, which increases employee's skills in innovation (Bauernschuster et al., 2010). In addition, providing employees with the opportunity for training can increase the engagement between the employee and the organization because they feel that they are important enough to contribute their ideas to foster innovation (Nyberg et al., 2014).

Performance Appraisals

The research results showed that performance appraisal promotes individual innovation and creativity at work; it helps employees generate new ideas to develop better products, services, and work processes because it is linked to the innovation mission's success. The research results indicated that innovation performance evaluation criteria will be set in KPIs. KPIs define the responsibility directly of employees for developing, improving their work to be innovative. Performance-related innovation evaluation criteria contribute to individuals' success and result in the organization having many innovative projects to submit to a contest continuously. This is consistent with Boswell and Boudreau (2000), who indicate that performance appraisal encourages employees in terms of effort, satisfaction, and aspiration, which are relevant to innovative behavior (Boswell & Boudreau, 2000). Performance appraisal is a strategic instrument for improving organizational performance because the evaluation results will show the advantages and disadvantages of individuals. Thus, employees will use this result to develop their work performance. Shipton et al. (2006) suggested that the appraisal process's feedback leads to recognizing the gaps between performance and the organization's goals and motivating employees to work creatively (Shipton, West, Dawson, Birdi, & Patterson, 2006). When the organization receives feedback after the performance appraisal, this process facilitates the development of creativity (Jiang et al., 2012). Moreover, appraisals foster learning and growth that help employees have the confidence for higher-level learning (Stiles, Gratton, Bailey, Hope-Hailey, & McGovern, 2007).

Rewards and Recognition

The awarded organizations reward their contributors for successful innovation in terms of intrinsic rewards by giving compliments, showing respect, and accepting workers through presenting successful results published through various organization media. This demonstrates the management's support in promoting and strengthening innovation development where employee dedication is meaningful to the organization and represents the leader's acceptance of motivating employees to develop further innovation. The qualitative results showed that in a public organization, extrinsic rewards are related to KPIs. The successful implementation of a project will affect

performance appraisal results, salary increases, and promotions. This is consistent with Jiang et al. (2012), who pointed out that reward systems motivate employees to increase their inspiration, participation and generate ideas for fostering innovation (Jiang et al., 2012). The organization drives innovation through rewards and recognitions by linking innovation as the goal and core values; thus, employees will attempt to increase their potential to meet the goals and core values (Leavitt, 2009). The reward system encourages employees to make extra efforts to carry out innovative projects because they can pursue ideas, recognition, compensation, and promotion (Amabile, 2003; Shipton et al., 2006). This is consistent with Leavitt (2009), who indicated that recognition is critical for individual achievement in order to encourage innovative behavior (Leavitt, 2009). Stefanovska Ceravolo and Ristova-Drewanz (2011) suggested that the leader should consider the motivation factor, such as work recognition, salary, creating a positive working environment, and continuing training, as excellent types of motivation to achieve better performance and innovative management success (Stefanovska Ceravolo & Ristova, 2011). These research results were are consistent with previous research of Jiang et al. (2012), who indicated that feedback from performance appraisal is related positively to the overall level of employee creativity in the organization (Jiang et al., 2012). Bednall et al. (2014) also stated that performance appraisal is considered one of the most critical of human resource management practices that link with the organization's performance (Bednall, Sanders, & Runhaar, 2014). In addition, through performance appraisal, expectations are stated, innovative behaviors are encouraged, and feedback is provided (Andreeva, Vanhala, Sergeeva, Ritala, & Kianto, 2017).

5.2.2.6 Organizational System

The organizational system positively was seen to affect innovation management effectiveness with a significance level of 0.05 (β =.202, $p<.001$) . Employees perceived that the organizational system was consistent with a high level of innovation management effectiveness with a mean of 4.66. Regarding the innovation organization system, the researcher divided the innovation organization's characteristics into three; the communication system, the knowledge management system, and the resource management system.

Communication System

The quantitative results showed that employees perceived that the communication system was consistent with a high level of innovation management effectiveness with a mean of 4.72. This is consistent with the qualitative results, which show that communication is necessary because communication processes influence members to achieve shared values and goals. Therefore, effective communication acts as an essential factor that leads to success in innovation management effectiveness. This is consistent with Snyder and Duarte (2003), who showed that an effective innovation organization must focus on communication so that people in the organization are committed to cultivating innovation, which is an initial plan that will lead to the goal of successful innovation management (Snyder & Duarte, 2003). Mas et al. (2003) also suggested that effective internal communication within organizations creates awareness regarding innovation matters (Mas, Claudia; Huck, Simone; Zerfass, 2005).

In addition, internal communication is critical in supporting innovation management because ideas are shared and are integrated between meetings or face-to-face contact in the innovation process. Two-way communication is one of the types of internal communication that the awarded organization applies in implementing the innovation process. It can create an environment in which people can share their ideas and opinion. Moreover, it improves the relationships among members of teams. The qualitative results also showed that effective two-way communication improves trust between leaders and employees and enhances collaboration across the organization. This is consistent with Bonsón et al. (2012), who indicated that two-way communication is needed for participation and collaboration in the innovation process; individuals obtain benefits when they receive feedback for improvement (Bonsón et al., 2012). Two-way communication generates new ideas and commitment to task performance because communication is effective when employees receive feedback on their performance from leaders (Damanpour, 1991; Ruppel & Harrington, 2000).

The communication that will result in innovation is not just about the internal communication that focuses on communication between supervisors and employees.

External communication in communicating with people, stakeholders, or other agencies is also crucial because it will allow for obtaining critical information for innovation management and for the exchange of new knowledge with other experts. This is consistent with Christiansen (2000), who suggested that both internal and external communication are crucial for innovation management in terms of the organization's communication to promote understanding among innovative project members effectively. In contrast, external communication is related to raising awareness and people's expectations of regarding and services (Christiansen, 2000).

Furthermore, the obtained qualitative research results also showed that various formal and informal communication channels, and employees that can easily access and exchange knowledge and information, support effective innovation. Communication channels are essential for effective innovation management. Formal communication is associated with the innovation process because it helps maintain the responsibility and maintain the authority relationship in the work process. Formal communication is the official message sent from the leader to employees, for example, via formal meetings, reports, websites, memos, and other information flows. On the other hand, informal communication is another channel that supports innovation in sharing knowledge, ideas, and opinions through email, social media platforms, and coffee meetings. The information communicated must be adequate and complete in order to take proper decisions and make action plans together. This is in line with Tidd (2001), who indicated that innovative organizations should use various communication channels and improve communication with clarity and frequency of communication across departments and among organizations in order to gather different ideas (Tidd, 2001). Adair (2009) also stated that communication in various channels is beneficial for information flow because open communication and frequency of communication among departments lead to discovering new ideas, gathering information, and encouraging innovation (Adair, 2011). Katarína et al. (2015) stated that formal and informal communication can all work together to promote innovation (Katarína & Monika, 2015).

Resource Management

The quantitative results showed that employees perceived that the resource management system was consistent with a high level of innovation management effectiveness with a mean of 4.44. Resource availability is one of the essential factors in an innovative organization. The quantitative results were consistent with the qualitative results; the results showed that sufficient resources such as human resources, money, materials impact the employees' perceptions of innovation support in the organization. Combining skills and unique resources can maintain and increase differentiation and lead to success in innovation management. This is in line with the resource-based view (RBV) concept, which indicates that when organizations have complex resources to imitate and create value, these resources can produce a competitive advantage (Barney, 2001). The RBV has been able to bring a more systematic approach to organization-level analysis by characterizing the organization as a collection of resources and capabilities (Lawson & Samson, 2002; Wernerfelt, 1984). The RBV assumes that the performance differences across organizations are due to differences arising from valuable organization-specific resources and capabilities that cannot be easily imitated or substituted (Barney, 2001; Hamel & Getz, 2004). As organizations successfully manage innovation, they accumulate experience and learning, further supporting still further improvements (Lawson & Samson, 2002).

In addition, finance plays a critical role in innovation as it allows organizations to conduct research, adopt the technologies necessary for inventions, and develop and commercialize innovations. The awarded organization supports funds for R&D from both organization and external sources and creates continuous development and new products and services. Kostopoulos (2002) suggested that organizations that support funds for R&D and innovation processes are more successful in innovation projects (Kostopoulos et al., 2002). Organizations can fund innovation activities using various funding instruments provided by different financial intermediaries (Organisation for Economic Co-operation and Development, 2013). Hewitt-Dundas (2006) indicated a strong relationship between a lack of finance to innovation and the risk attached to innovation, and financial constraints included a lack of finance for innovation and a projected low rate of return from innovative

activities (Hewitt-Dundas, 2006). The OECD also pointed out that a lack of supporting funding and insufficient resources for the innovation process were obstacles to implementing innovation (OECD, 2017).

In addition, physical resources are also critical for each level of organization to support innovation. The awarded organization supports physical resources such as technology and equipment in implementing innovative projects and ensuring that each project has sufficient resources. The physical resource affects the innovation process because it enables the development of new technologies in services, processes, and products to facilitate innovation and foster continuous process improvement. This is in line with Lawson and Samson (2002), who stated that effective resource management in providing sufficient critical physical resources helps increase the number of innovation initiatives and improves the probability of stimulating innovation (Lawson & Samson, 2001). Suwannathat et al. (2015) suggested that the organization provides the modern technology and tools that can stimulate innovation; this shows that the organization encourages employees to have sufficient and necessary resources to implement innovation (Suwannathat et al., 2015). Furthermore, allocating the necessary resources such as equipment will encourage innovation management to be more effective, especially during the innovation process (Ahmed & Shepherd, 2010).

Knowledge Management

The quantitative results showed that employees perceived that knowledge management was consistent with a high level of innovation management effectiveness with a mean of 4.71. The awarded organization focuses on knowledge management in supporting employees in acquiring and sharing information inside and outside the organization. The organization believes that knowledge management promotes innovative work and leads to success in innovative work. Thus, the organization promotes exchanging information to seek knowledge both within and outside the organization. This is consistent with Ngoc-Tan (2018), who indicated that knowledge management positively impacts innovation in the public organization in creating new ideas, products, and services; this will bring about competitive advantages for an

organization (Ngoc-Tan & Gregar, 2018). Nowacki and Bachnik (2016) also stated that knowledge management helps the organization identify the up-coming trends, decreases uncertainty, and helps employees acquire new skills that benefit the development of innovation (Nowacki & Bachnik, 2016). Moreover, Raz et al.(2012) indicated that the organization that acquires new knowledge from both outside and inside will get the opportunity to combine the new knowledge and existing knowledge to create innovative products and services (Raz, Ghorbani, & Elahi, 2012). Organizations that rapidly capture and implement new knowledge across the organization can foster innovation compared to those organizations that do not focus on knowledge acquisition (Cavusgil, Calantone, & Zhao, 2003). In addition, the results of this research are consistent with previous studies, which suggested that knowledge acquisition is related to innovation performance (Dahlander, O'Mahony, & Gann, 2016; Leiponen & Helfat, 2011; Papa, Dezi, Gregori, Mueller, & Miglietta, 2018). Knowledge acquisition helps the organization develop new helpful knowledge for creating innovative projects (Leiponen & Helfat, 2011). Moreover, it enriches the pool of solutions available for solving innovation challenges to the organization (Dahlander et al., 2016). Honarpour et al. (2012) also indicated that the interaction between newly obtained knowledge and existing knowledge would modify organizational knowledge storage, increase knowledge depth, and raise innovation performance potential (Honarpour, Jusoh, & Md Nor, 2012).

The quantitative results were consistent with the qualitative results; the results showed that the awarded organization has several tools designed to transfer and exchange knowledge, for example, documents, forums, coaching, social network platforms, and websites, in order to provide employees with access to the exchange of knowledge through various channels. Moreover, employees' creativity can be enhanced due to sharing of their experiences and accumulated knowledge with each other. This is consistent with Nonaka and Takeuchi (1995), who indicated that knowledge sharing can be considered an important tool in creating creativity and innovation; thus, any new product or innovative idea will be part of the sharing of new knowledge (Nonaka & Takeuchi, 1995). Kamasak and Bulutlar (2010) also indicated that knowledge sharing is essential for innovation because it improves an organization's existing products, processes, or services (Kamaşak & Bulutlar, 2010).

Knowledge sharing is the process of exchanging data, information, know-how, skills, feedback, and expertise regarding products, procedures, and processes; thus, it is critical for innovation management in creating new products and services (Myers & Cheung, 2008). The individual stage of knowledge distribution also helps organizations switch individual-owned knowledge to organizational knowledge among organizations and to succeed in developing innovation (Kharabsheh, Magableh, & Sawadha, 2012). Furthermore, effective knowledge sharing between members helps solve the innovation process (Ofori, Osei, Ato–Mensah, & Affum, 2015). Matthews (2019) suggested that the effective implementation of knowledge management in the innovation process can bring about faster development of new products and services, optimize R&D performance, and differentiate products and services (Matthews, 2003).

In addition, the organization has knowledge applications related to current knowledge for solving existing problems and finding solutions that can develop innovation. Thus, it can be seen that the products and services of the organization can fix existing problems and improve its services. This is in line with Boateng and Agyemag (2015), who indicated that knowledge application is a process within the organization that enables it to use and leverage knowledge to improve its operations, develop new products, and generate new knowledge (Boateng & Agyemang, 2015). Shin et al. (2001) also pointed out that offering knowledge integration methods can improve organizational effectiveness (Shin, Holden, & Schmidt, 2001). When knowledge is effectively applied, it reduces costs and increases the efficiency of organizations (Allameh & Zare, 2011).

In addition, McAdam (2000) proposed that innovation in the organization is related to the practical application of knowledge resources to increase organizational innovation performance (McAdam, 2000).

5.3 Recommendations

5.3.1 Recommendations for Implementation

This research can be considered as a guideline for developing innovation for other public sectors that require developing service innovation to be successful by considering both external and internal factors.

5.3.1.1 The changes of external circumstances, whether economic situations, social context changes, the development of science, technology, research and innovation, and natural resource situations, play an important role in the organization's adaptation. Consequently, organizations have to raise the quality and standard of service by using innovation as the basis for development to increase service performance. Moreover, the increasing development of innovation in the public sector encourages organizations to have the potential for enhancing competitiveness and sustainable development.

5.3.1.2 The organization that will develop into an innovative one should focus on the leader, organizational strategy, organizational culture, organizational structure, human resource management, and the organizational system. Top managers are the most important persons in driving and fostering innovation in the organization by setting strategies and creating an organizational culture and structure that will stimulate and promote innovation. In addition, creating an internal system that supports innovation is an effective mechanism for driving innovation, whether it has a resource support system, knowledge management, or a communication system. Focusing on human resource management is another factor that supports innovation management because talented and creative members can be regarded as perfect sources of innovation. The ideas presented in the present work can be used to determine how the organization is characterized and what can be applied. However, applications must consider the context of organizations' differences since each organization has different goals and work contexts according to its characteristics.

5.3.2 Policy Recommendations

5.3.2.1. More cooperation in innovation work should be promoted, for example, among the public sector, private sectors, and universities. This is because some innovations cannot be entirely performed with one organization's capabilities. Thus, cooperation is vital in terms of exchanging knowledge and experience in research and development. In addition, the organization may be funded for the development and commercialization of specific innovations. Thus, collaboration contributes to innovation development in terms of the performance of employees and innovation products or services and contributes to the improvement of the organization's potential.

5.3.2.2 Government policies should try to push the public sectors to develop innovation. Furthermore, The OPDC should have a system to exchange knowledge through knowledge management among best practices organizations and other organizations that need successful innovation development in order to convey innovation management methods and to inspire other organizations in terms of organizational innovation development. In addition, the OPDC should have a mentoring organization system for consulting regarding innovation management among the awarded organizations and organizations that begin developing organizational innovation by considering pairing the organizations that have similar contexts.

5.3.2.3 Some innovations are associated with the law. However, legislative changes to conform to the innovation that has been created takes a long time to consider and does not guarantee that the law will be solved. This can make the innovations obsolete and sometimes impossible to use. Thus, the government should consider and improve the complex legal amendments processes or still pending approval to be implemented successfully in order to develop innovation.

5.3.2.4 The government should support the collaboration systems among the public sector organizations to coordinate better in terms of information linkages and practices because some of the innovation outputs must be implemented with other organizations. Moreover, the government should facilitate shared resources

and budgets with the agencies with related missions in order to cooperate in the research and develop innovative services to the public to reduce problems and limitations in cross-functional collaboration between public sector organizations. In addition, service innovation should be more efficient, and people should be able to access government services quickly and without confusion.

5.3.3 Recommendations for Future Research

5.3.3.1 Study and research should be carried out in order to develop a model for organizational innovation management in the public sector to guide executives and related departments in developing organizational innovation and to develop it into a high-performance organization.

5.3.3.2 A broad range of award-winning public sectors should be studied, such as state enterprises, public organizations, and provincial governments in order to gain more in-depth information because this research was limited to the department level. In addition, other factors that affect innovation management effectiveness should be ascertained.

5.3.3.3 The six components of innovation management effectiveness can be studied separately greater in-depth study of the characteristics, activities, and actions of creating an innovative organization in the public sector in Thailand.

5.3.3.4 The factors that contribute to the success of organizational innovation management from the perspective of the public, that is the stakeholders, should be studied in order to comprehensive information for in-depth analysis of expectation, satisfaction, and recommendation

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APPENDIXS

APPENDIX A

QUESTIONAIRE

Questionnaire

The Determinants Toward Fostering Innovation Effectiveness in Thai Public Service: Empirical Study of Awarded Organization

Explanation: This questionnaire is part of a doctoral dissertation in Development Administration, the Graduate School of Public Administration at National Institute of Development Administration, composed of 8 sections.

Part 1 General Information
Part 2 Innovative Leadership
Part 3 Organizational Culture
Part 4 Innovation Strategy
Part 5 Human resource management
Part 6 Organizational system
Part 7 Organizational Structure
Part 8 Innovation Management Effectiveness

You are requested to rate your agreement for each statement of this questionnaire. Your responses will be recorded anonymously and will be strictly kept confidential. The researcher would like to thank all the respondents for their valuable feedback and participation. Should you have any concerns, please do not hesitate to contact the researcher via naphatpapa@gmail.com

Best Regards,
Mrs. Naphatpapa Sawangnuwatkul
Doctoral Candidate (The Researcher)
Graduated School of Public Administration
National Institute of Development Administration (NIDA)

Questionnaire

Part 1 General Information

Instruction This part of the questionnaire is to describe the demographic information of respondents. Please respond by making √ in ( ) that fits you best or answering each of the following questions.

1. Gender ☐ Male ☐ Female

2. Highest Education Level ☐ Below a Bachelor's ☐ Bachelor's degree

☐ Master's degree ☐ Doctoral degree

3. Name of Department …….

4. Position……

5. Length of service ..... years

Instruction Please mark √ in the space that best describes your answer

Level of agreement

1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree

4 = Slightly Agree , 5 = Agree, 6 =Strongly Agree

Part 2 Innovative Leadership

Measurement	Level of Agreement					
	1	2	3	4	5	6
1.The leader has a clear policy on innovation management.						
2.The leader can establish vision, goals, and innovative strategies.						
3. The leader has knowledge and ability regarding innovation management.						
4. The leader involved in the innovation process.						
5. The leader implement new processes at work to generate new ideas for creating innovation						
6. The leader dares to take the risks and accept failure that might occur.						
7. The leader empowers employees to work on innovative projects.						
8. The leader can coach and advise employees on innovative projects.						
9. The leader gives the techniques for problem-solving in the innovation process.						
10. The leader is open to accepting personnel to express opinions and criticism to solve problems.						
11. The leader provides constructive feedback to employees.						
12. The leader encourages employees to generate creative ideas and solutions.						
13. The leader facilitates collaborative teamwork in innovation projects.						
14: The leader creates an excellent learning environment to promote innovation						

Measurement	Level of Agreement					
	1	**2**	**3**	**4**	**5**	**6**
15. The leader uses a formal channel such as policies, memos, and meetings to communicate and gather initial information and to find solutions in innovative projects.						
16. The leader motivates employees to contribute to the success of innovative projects by giving rewards and recognition.						
17. The leader fosters a workplace culture that allows people to try new things and think "outside the box."						
18. The leader supports a workplace culture in which employees are always eager to learn.						
19. The leader develops a culture that supports employees to share knowledge and coordinate with others.						
20. The leader promotes best KM practices that relate to innovation.						
21. The leader facilitates information sharing across the organization.						
22. The leader supports the development of innovative exchange channels such as organizational websites and social media.						
23. The leader provides critical resources and tasks to implement innovation.						
24. The leader effectively utilizes existing resources and increases resource activities to develop innovation.						

Part 2 Innovation Strategy

Measurement	Level of Agreement					
	1	2	3	4	5	6
25. Your organization has a policy for boosting innovation.						
26. Your organization has a vision that shows the desire to create innovation.						

Measurement	Level of Agreement					
	1	2	3	4	5	6
27. Your organization communicates its vision, strategies, and goals related to innovation at all organizational levels.						
28. Your organization has developed an innovation strategy as a guideline for promoting innovation.						
29. Your organization has a process to convert innovation strategy into an annual action plan.						
30. Your organization sets innovative strategy goals at a level that can be achieved.						
31. Your organization has continuous and systematic innovation strategy development.						
32. Your organization monitors and measures innovation performance according to the strategic plan.						
33. Innovation strategies help your organization have a clear direction to implement innovation.						
34. Your organization adjusts its strategies to a fast-changing work environment.						

Part 3 Organizational Culture

Measurement	Level of Agreement					
	1	2	3	4	5	6
35. Innovation is a shared value in your organization.						
36. Your organization encourages employees to recognize and be responsible for the organization’s innovation goals.						
37. Your organization has an open culture by supporting diversity and accepting different opinions.						
38. Your organization has a proactive culture to drive innovation in the organization.						
39. Your organization has an organizational culture that encourages employees to take risks and accepts mistakes without punishment.						

Measurement	Level of Agreement					
	1	2	3	4	5	6
40. Your organization culture shows an adaptive readiness to deal with change.						
41. Your organization creates a culture of teamwork.						
42. Your organization builds a competitive culture to motivate the employee to initiate new ideas.						
43. Your organization has an empowered culture for employees at all levels.						
44. Your organization creates a continuous learning culture.						

Part 4 Organizational Structure

Measurement	Level of Agreement					
	1	**2**	**3**	**4**	**5**	**6**
45. Your organization has decentralized employees to have the authority to make decisions in the innovation process.						
46. The organizational structure in your organization encourages a flexible work environment for decision and their implementation.						
47. The organizational structure in your organization increases involvement for employees in the innovation process.						
48. Your organization has a flexible organizational structure to facilitate innovation.						
49. Your organization gives employees the freedom to work on innovative projects.						
50. The organization adjusts its structure under the innovation strategy.						
51. Your organization promotes specialization to initiate innovation.						

Measurement	Level of Agreement					
	1	2	3	4	5	6
52. Your organization has established a special unit to be responsible for creating innovation.						
53. Your organization creates across functional team members to share various knowledge, and expertise for developing innovation.						
54. Your organization creates networks with external agencies to exchange information and resources.						

Part 5 Human resource management

Measurement	Level of Agreement					
	1	2	3	4	5	6
55. Your organization recruits and selects competent employees that are consistent with creating and developing innovation.						
56. Your organization specifies innovation as a core competency.						
57. Your organization develops competency, indicating the performance, attitudes, and skills relevant to promoting innovation.						
58. Your organization provides training and skills development for the creativity and innovation of employees.						
59. The training in innovation in your organization encourages you to feel that you are important enough to contribute your ideas to foster innovation.						
60. Your organization supports employees to acquire new knowledge to find solutions in innovative projects.						
61. You can apply creative ideas to solve complex problems that are within your job responsibility.						
62. Your organization has job rotation for developing the ability to work.						
63. Job rotation increases the level of flexibility, freedom, and cooperative teamwork.						

Measurement	Level of Agreement					
	1	2	3	4	5	6
64. Your organization increases flexibility in job responsibilities such as work time.						
65. Your organization supports a work-life balance for employees to spend time thinking of creative things.						
66. Your organization has an open-door policy to allow employees to exchange ideas and comments with the managerial positions at all levels.						
67. Your organization has defined innovation as part of the performance evaluation criteria.						
68. Your organization allows employees to participate in setting performance evaluation goals.						
69. Your organization maintains and reduces the turnover rate of creative and innovative employees.						
70. Your organization rewards employees for their achievement in innovation.						
71. Your organization provides extrinsic rewards when employees achieve innovation goals such as incentives, bonuses, and special rewards.						
72. Your organization provides intrinsic rewards when employees achieve innovation goals such as appreciation, empowerment, and freedom.						

Part 6 Organizational system

Measurement	Level of Agreement					
Communication	**1**	**2**	**3**	**4**	**5**	**6**
73. Your organization has various communication channels that employees can access, such as social media, email, boards, and web boards.						
74. Your organization has a channel to exchange knowledge and information about innovation that all employees can easily access.						

Measurement	Level of Agreement					
	1	2	3	4	5	6
75. Your organization communicates about service innovation to stakeholders such as service recipients.						
76. Your organization supports internal communication (e.g., face-to-face communication, emails, and group meetings) among team members to support idea generation and to improve the quality of products and services in innovative projects.						
Resource Management						
77. Your organization provides sufficient physical resources dedicated to tasks, e.g., technology and equipment.						
78. Your organization provides sufficient intangible resources, e.g., staff and knowledge in the innovation projects.						
79. Your organization supports enough funds in R&D in the innovation projects.						
80. Your organization has a strategic plan in resource management to deal with uncertain environments.						
Knowledge Management						
81. Your organization encourages employees to share knowledge and information formally, e.g., meetings and reports.						
82. Your organization encourages employees to share knowledge and information informally, e.g., informal talks, social media, and web-boards.						
83. Your organization gathers knowledge and information about innovation from both inside and outside the organization.						
84. Your organization searches for employees creative ideas and pushes those ideas into innovation.						
85. Your organization provides easy access to knowledge through different channels such as the						

Measurement	Level of Agreement					
	1	2	3	4	5	6
intranet, Internet, meetings, policies, and procedures.						
86. Knowledge sharing in your organization increases the participation level in learning and creates new knowledge.						
87. Your organization supports knowledge sharing among groups to transfer creative ideas.						
88. Knowledge sharing between employees helps the organization successfully adopt new ideas, products, and services.						
89. Your organization systematically collects employees' ideas in order to use those ideas to create innovation.						
90. Your organization has knowledge applications related the current knowledge to solve existing problems.						
91. Knowledge application plays an important role in increasing administrative and technical innovation in your organization.						

Part 7 Innovation Management Effectiveness

Measurement	Level of Agreement					
	1	2	3	4	5	6
92. Your organization improves its overall organizational performance when adopting innovation.						
93. Your organization has improved productivity in public services.						
94. Your organization's service innovation improves the quality of services to the public comprehensively and systematically.						
95. Your organization has developed employees' potential in innovation development continuously.						
96. Your organization continually encourages employees to participate in the development of innovation.						

Measurement	Level of Agreement					
	1	2	3	4	5	6
97. Your organization has a process to drive outstanding innovation projects to national competition.						
98. Your organization has been recognized as a modern and high-performing one.						

Interview Form

Explanation

This interview form is used to collect data regarding the determinants toward fostering innovation effectiveness in Thai public service: Empirical study of the awarded organization. This interview form consists of 4 parts as follows.

Part 1 General Information of the Key Informants

1) Name and surname of the key informants

2) Current position

3) Organization

Part 2 The importance of creating public service innovation

1) How do you define the term "Public Service Innovation"?

2) In your opinion, do you think creating public service innovation is important for your organization? Why?

3) In your opinion, what is the importance of receiving the public service innovation award for your organization?

Part 3 The characteristic of awarded organization for public service innovation

1) How does your organization manage innovation effectively?

2) How does your organization promote the employee’s potential in innovation management?

3) How does your competence of public service?

Part 4 The determinants toward fostering public service innovation

1) How does your leader display leadership behavior to foster public service innovation?

2) How does your organization apply human resource management practices to foster public service innovation?

3) How does your organization apply innovation strategy to foster public service innovation?

4) How does your organization transmit organizational culture to foster public service innovation?

5) How does your organization change organizational structure to foster public service innovation?

6) How does your organization apply knowledge management to foster public service innovation?

7) How does your organization apply communication to foster public service innovation?

8) How does your organization apply resource management to foster public service innovation?

APPENDIX B

Index of Item-Objective Congruence (IOC) of Questionnaire

The result of the Index of Item-Objective Congruence (IOC)

+1 means that the question is consistent with the objective.

0 means that the question is unclearly consistent with the objective.

-1 means that the question is not consistent with the objective.

Construct	Experts					Total	IOC
	1	2	3	4	5		
Innovative Leadership							
1.The leader has a clear policy on innovation management.	+1	+1	+1	+1	+1	5	1
2.The leader can establish vision, goals, and innovative strategies.	+1	+1	+1	+1	+1	5	1
3. The leader has knowledge and ability regarding innovation management.	+1	0	0	+1	+1	3	0.6
4. The leader involved in the innovation process.	+1	+1	+1	+1	+1	5	1
5. The leader implement new processes at work to generate new ideas for creating innovation	+1	+1	+1	+1	+1	5	1
6. The leader dares to take the risks and accept failure that might occur.	+1	+1	+1	0	+1	4	0.8
7. The leader empowers employees to work on innovative projects.	+1	+1	+1	+1	+1	5	1
8. The leader can coach and advise employees on innovative projects.	+1	+1	+1	+1	+1	5	1
9. The leader gives the techniques for problem-solving in the innovation process.	0	+1	+1	+1	0	3	0.6
10. The leader is open to accepting personnel to express opinions and criticism to solve problems.	-1	+1	+1	+1	+1	3	0.6
11. The leader provides constructive feedback to employees.	+1	+1	+1	+1	+1	5	1
12. The leader encourages employees to generate creative ideas and solutions.	+1	+1	+1	+1	+1	5	1

Construct	Experts					Total	IOC
	1	2	3	4	5		
13. The leader facilitates collaborative teamwork in innovation projects.	+1	0	+1	0	+1	3	0.60
14. The leader creates an excellent learning environment to promote innovation	0	0	+1	+1	+1	3	0.6
15. The leader uses a formal channel such as policies, memos, and meetings to communicate and gather initial information and to find solutions in innovative projects.	+1	0	+1	+1	+1	4	0.8
16. The leader motivates employees to contribute to the success of innovative projects by giving rewards and recognition.	+1	+1	+1	+1	+1	5	1
17. The leader fosters a workplace culture that allows people to try new things and think “outside the box.”	+1	+1	+1	+1	+1	5	1
18. The leader supports a workplace culture in which employees are always eager to learn.	+1	+1	+1	0	0	3	0.6
19. The leader develops a culture that supports employees to share knowledge and coordinate with others.	+1	+1	+1	+1	+1	5	1
20. The leader promotes best KM practices that relate to innovation.	+1	+1	+1	+1	+1	5	1
21. The leader facilitates information sharing across the organization.	+1	+1	+1	+1	+1	5	1
22. The leader supports the development of innovative exchange channels such as organizational websites and social media.	+1	+1	+1	+1	+1	5	1

Construct	Experts					Total	IOC
	1	2	3	4	5		
23. The leader provides critical resources and tasks to implement innovation.	+1	+1	+1	+1	+1	5	1
24. The leader effectively utilizes existing resources and increases resource activities to develop innovation.	+1	+1	+1	+1	+1	5	1
Innovation Strategy							
25. Your organization has a policy for boosting innovation.	+1	+1	+1	+1	+1	5	1
26. Your organization has a vision that shows the desire to create innovation.	+1	+1	+1	+1	+1	5	1
27. Your organization communicates its vision, strategies, and goals related to innovation at all organizational levels.	+1	+1	+1	+1	+1	5	1
28. Your organization has developed an innovation strategy as a guideline for promoting innovation.	+1	+1	+1	+1	+1	5	1
29. Your organization has a process to convert innovation strategy into an annual action plan.	+1	+1	+1	+1	+1	5	1
30. Your organization sets innovative strategy goals at a level that can be achieved.	+1	0	0	+1	+1	3	0.6
31. Your organization has continuous and systematic innovation strategy development.	+1	+1	0	0	+1	3	0.6
32. Your organization monitors and measures innovation performance according to the strategic plan.	+1	+1	+1	+1	+1	5	1
33. Innovation strategies help your organization have a clear direction to implement innovation.	+1	+1	+1	+1	+1	5	1

Construct	Experts					Total	IOC
	1	2	3	4	5		
34. Your organization adjusts its strategies to a fast-changing work environment.	+1	+1	+1	+1	+1	5	1
Organizational Culture							
35. Innovation is a shared value in your organization.	+1	+1	+1	+1	+1	5	1
36. Your organization encourages employees to recognize and be responsible for the organization's innovation goals.	+1	+1	+1	+1	+1	5	1
37. Your organization has an open culture by supporting diversity and accepting different opinions.	+1	+1	+1	+1	+1	5	1
38. Your organization has a proactive culture to drive innovation in the organization.	+1	+1	+1	+1	+1	5	1
39. Your organization has an organizational culture that encourages employees to take risks and accepts mistakes without punishment.	+1	+1	+1	+1	+1	5	1
40. Your organization culture shows an adaptive readiness to deal with change.	0	0	+1	+1	+1	3	0.6
41. Your organization creates a culture of teamwork.	+1	+1	+1	+1	+1	5	1
42. Your organization builds a competitive culture to motivate the employee to initiate new ideas.	+1	+1	+1	+1	+1	5	1
43. Your organization has an empowered culture for employees at all levels.	+1	+1	+1	+1	+1	5	1
44. Your organization creates a continuous learning culture.	+1	+1	0	0	+1	3	0.6
Organizational Structure							
45. Your organization has decentralized employees to have	+1	+1	+1	+1	+1	5	1

Construct	Experts					Total	IOC
	1	2	3	4	5		
the authority to make decisions in the innovation process.							
46. The organizational structure in your organization encourages a flexible work environment for decision and their implementation.	+1	+1	+1	+1	+1	5	1
47. The organizational structure in your organization increases involvement for employees in the innovation process.	+1	+1	+1	+1	+1	5	1
48. Your organization has a flexible organizational structure to facilitate innovation.	+1	+1	+1	+1	+1	5	1
49. Your organization gives employees the freedom to work on innovative projects.	+1	+1	+1	+1	+1	5	1
50. The organization adjusts its structure under the innovation strategy.	+1	+1	+1	+1	+1	5	1
51. Your organization promotes specialization to initiate innovation.	+1	0	0	+1	+1	3	0.6
52. Your organization has established a special unit to be responsible for creating innovation.	+1	+1	+1	+1	+1	5	1
53. Your organization creates across functional team members to share various knowledge, and expertise for developing innovation.	+1	+1	+1	+1	+1	5	1
54. Your organization creates networks with external agencies to exchange information and resources.	+1	+1	+1	+1	+1	5	1
Human Resource Management							
55. Your organization recruits and selects competent employees that are consistent with creating and developing innovation.	0	0	+1	+1	+1	3	0.6

Construct	Experts					Total	IOC
	1	2	3	4	5		
56. Your organization specifies innovation as a core competency.	+1	+1	+1	+1	+1	5	1
57. Your organization develops competency, indicating the performance, attitudes, and skills relevant to promoting innovation.	+1	+1	+1	+1	+1	5	1
58. Your organization provides training and skills development for the creativity and innovation of employees.	+1	+1	+1	+1	+1	5	1
59. The training in innovation in your organization encourages you to feel that you are important enough to contribute your ideas to foster innovation.	+1	+1	+1	+1	+1	5	1
60. Your organization supports employees to acquire new knowledge to find solutions in innovative projects.	+1	+1	0	0	+1	3	0.6
61. You can apply creative ideas to solve complex problems that are within your job responsibility.	+1	+1	+1	+1	+1	5	1
62. Your organization has job rotation for developing the ability to work.	0	0	+1	+1	+1	3	0.6
63. Job rotation increases the level of flexibility, freedom, and cooperative teamwork.	+1	+1	0	+1	0	3	0.6
64. Your organization increases flexibility in job responsibilities such as work time.	0	+1	+1	+1	+1	4	0.8
65. Your organization supports a work-life balance for employees to spend time thinking of creative things.	+1	+1	+1	+1	0	4	0.8
66. Your organization has an open-door policy to allow employees to exchange ideas and comments with	+1	+1	+1	+1	+1	5	1

Construct	Experts					Total	IOC
	1	2	3	4	5		
the managerial positions at all levels.							
67. Your organization has defined innovation as part of the performance evaluation criteria.	+1	+1	+1	+1	+1	5	1
68. Your organization allows employees to participate in setting performance evaluation goals.	+1	+1	+1	+1	+1	5	1
69. Your organization maintains and reduces the turnover rate of creative and innovative employees.	+1	0	0	+1	+1	3	0.6
70. Your organization rewards employees for their achievement in innovation.	+1	+1	+1	+1	+1	5	1
71. Your organization provides extrinsic rewards when employees achieve innovation goals such as incentives, bonuses, and special rewards.	+1	+1	+1	+1	+1	5	1
72. Your organization provides intrinsic rewards when employees achieve innovation goals such as appreciation, empowerment, and freedom.	+1	+1	+1	+1	+1	5	1
Organizational System							
<u>Communication</u>							
73. Your organization has various communication channels that employees can access, such as social media, email, boards, and web boards.	+1	+1	+1	+1	+1	5	1
74. Your organization has a channel to exchange knowledge and information about innovation that all employees can easily access.	+1	+1	+1	+1	0	4	0.8

Construct	Experts					Total	IOC
	1	2	3	4	5		
75. Your organization communicates about service innovation to stakeholders such as service recipients.	+1	+1	+1	+1	+1	5	1
76. Your organization supports internal communication (e.g., face-to-face communication, emails, and group meetings) among team members to support idea generation and to improve the quality of products and services in innovative projects.	+1	+1	+1	+1	+1	5	1
Resource Management							
77. Your organization provides sufficient physical resources dedicated to tasks, e.g., technology and equipment.	+1	+1	+1	+1	+1	5	1
78. Your organization provides sufficient intangible resources, e.g., staff and knowledge in the innovation projects.	+1	+1	+1	+1	+1	5	1
79. Your organization supports enough funds in R&D in the innovation projects.	+1	+1	+1	+1	+1	5	1
80. Your organization has a strategic plan in resource management to deal with uncertain environments.	+1	0	0	+1	+1	3	0.6
Knowledge Management							
81. Your organization encourages employees to share knowledge and information formally, e.g., meetings and reports.	+1	+1	+1	+1	+1	5	1
82. Your organization encourages employees to share knowledge and information informally, e.g., informal talks, social media, and web-boards.	+1	+1	+1	+1	+1	5	1

Construct	Experts					Total	IOC
	1	2	3	4	5		
83. Your organization gathers knowledge and information about innovation from both inside and outside the organization.	+1	+1	+1	+1	+1	5	1
84. Your organization searches for employees creative ideas and pushes those ideas into innovation.	+1	+1	+1	+1	+1	5	1
85. Your organization provides easy access to knowledge through different channels such as the intranet, Internet, meetings, policies, and procedures.	+1	+1	+1	+1	+1	5	1
86. Knowledge sharing in your organization increases the participation level in learning and creates new knowledge.	+1	+1	+1	+1	+1	5	1
87. Your organization supports knowledge sharing among groups to transfer creative ideas.	+1	+1	+1	+1	+1	5	1
88. Knowledge sharing between employees helps the organization successfully adopt new ideas, products, and services.	+1	+1	+1	+1	+1	5	1
89. Your organization systematically collects employees' ideas in order to use those ideas to create innovation.	0	0	+1	+1	+1	3	0.6
90. Your organization has knowledge applications related the current knowledge to solve existing problems.	+1	0	+1	+1	+1	4	0.8
91. Knowledge application plays an important role in increasing administrative and technical innovation in your organization.	+1	+1	+1	+1	+1	5	1

Construct	Experts					Total	IOC
	1	2	3	4	5		
Innovation Management Effectiveness							
92. Your organization improves its overall organizational performance when adopting innovation.	+1	+1	+1	+1	+1	5	1
93. Your organization has improved productivity in public services.	+1	+1	+1	+1	+1	5	1
94. Your organization's service innovation improves the quality of services to the public comprehensively and systematically.	+1	+1	+1	+1	+1	5	1
95. Your organization has developed employees' potential in innovation development continuously.	+1	+1	+1	+1	+1	5	1
96. Your organization continually encourages employees to participate in the development of innovation.	+1	+1	+1	+1	+1	5	1
97. Your organization has a process to drive outstanding innovation projects to national competition.	+1	0	0	+1	+1	3	0.6
98. Your organization has been recognized as a modern and high-performing one.	+1	+1	0	+1	+1	4	0.8

BIOGRAPHY

Name-Surname	Mrs.Naphatpapa Sawangnuwatkul
Academic Background	Bachelor of Art (political science) (first-class honors) from Thammasat University, Bangkok, Thailand in 2005 Master of Public Administration from Chulalongkorn University, Bangkok, Thailand in 2009
Experience	Lecturer in Public Administration Faculty of Humanities and Social Sciences, Chandrakasem Rajabhat University Bangkok, Thailand Two years as an analyst in human resource management, Bangkok Bank Public Company Limited, Thailand