INNOVATION BUSINESS MODEL DEVELOPMENT FOR PUBLIC SECTOR TOWARDS INNOVATION POLICY IMPLEMENTATION IN MALAYSIA

MUHAMMAD YUSUF BIN ABDULLAH

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Razak Faculty of Technology and Informatics
Universiti Teknologi Malaysia

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For Her, because of HIM

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ABSTRACT

Since 2009, a substantial focus has been given to innovation through transformation agenda, which has resulted in strategic moves in policy and nationwide initiatives. This approach for improvement involves a change in public sector organisations, policy, and service delivery, implicating a huge number of resources and high failure risk. Such impacts influence international report monitoring and ranking among nations, especially in innovation. As the Malaysian Public Sector innovation landscape remains an understudied field together with an absence of measurement instrument and organisation-level innovation model, the drawback poses a tremendous risk towards innovation policy implementation. The aim of this research is to propose an Innovation Business Model for innovation policy implementation and reduce the empirical research gap in the public sector innovation knowledge base. This research examines the innovation landscape in the Malaysian public sector and its impact towards public sector organisation innovation performance through innovation capabilities and innovation management from a Business Model Perspective for contemporary model development. The current innovation business models in organisations were measured through quantitative research using the Structural Equation Modelling technique model to evaluate the impact towards overall organisation innovation performance. This research involves a sample size of 328 public sector middle managers selected by stratified random sampling, and a survey questionnaire as the research instrument. As hypothesised, Malaysian Public Sector innovation landscape was found to be dependent on innovation capabilities, both as a factor and mediator in influencing innovation performance. It was discovered that there is a dire need for an organisation-level model to balance the dependency and improve the innovation performance in public sector agencies by focusing on both innovation capabilities and innovation management. The contribution of this research is in developing an organisation-level Innovation Business Model within the Malaysian setting. Ultimately, the public sector can capitalise on implementing innovation and enhance organisational performance in both practical and the academia through the expansion of public sector literature in the Malaysian context. This motion can be accomplished through its Innovation Business Model development and the accompanying rediscovered measurement instrument.

ABSTRAK

Sejak 2009, tumpuan besar telah diberikan kepada inovasi melalui agenda transformasi, yang telah menghasilkan langkah strategik dalam dasar dan inisiatif di peringkat nasional. Pendekatan penambahbaikan ini melibatkan perubahan dalam organisasi sektor awam, dasar dan penyampaian perkhidmatan, yang melibatkan sejumlah besar sumber dan risiko kegagalan yang tinggi. Impak sedemikian mempengaruhi pemantauan dan penarafan laporan antarabangsa dalam kalangan negara, terutamanya dalam inovasi. Memandangkan landskap inovasi Sektor Awam Malaysia masih merupakan bidang yang kurang dikaji dan ketiadaan kaedah pengukuran serta model inovasi peringkat organisasi, kelemahan tersebut menimbulkan risiko yang besar terhadap pelaksanaan dasar inovasi. Matlamat kajian ini adalah untuk mencadangkan Model Perniagaan Inovasi untuk pelaksanaan dasar inovasi dan mengurangkan jurang kajian empirikal dalam pengetahuan inovasi sektor awam. Kajian ini meneliti lanskap inovasi dalam sektor awam di Malaysia serta impaknya kepada prestasi inovasi organisasi Sektor Awam melalui keupayaan inovasi dan pengurusan inovasi dari perspektif Model Perniagaan bagi membangun model inovasi yang kontemporari. Model Perniagaan Inovasi semasa dalam organisasi diukur melalui kajian kuantitatif menggunakan teknik *Structural Equation Model* dalam menilai impak terhadap prestasi inovasi organisasi secara keseluruhannya. Kajian ini melibatkan saiz sampel seramai 328 pegawai pengurus pertengahan organisasi sektor awam yang dipilih melalui pensampelan rawak berstrata dan kaedah soal selidik sebagai instrumen kajian. Seperti yang dihipotesiskan, landskap inovasi Sektor Awam Malaysia didapati bergantung kepada keupayaan inovasi, sebagai faktor dan pengantara dalam mempengaruhi prestasi inovasi. Adalah didapati bahawa wujud keperluan mendesak untuk model di peringkat organisasi Sektor Awam bagi mengimbangi kebergantungan tersebut dan menambah baik prestasi inovasi dengan memberi tumpuan kepada keupayaan inovasi dan pengurusan inovasi. Sumbangan kajian ini adalah dalam membangunkan Model Perniagaan Inovasi peringkat organisasi dalam persekitaran Malaysia. Akhirnya, Sektor Awam boleh memanfaatkan pelaksanaan inovasi dan meningkatkan prestasi organisasi dalam praktikal dan akademik melalui pengembangan kesusasteraan sektor awam dalam konteks Malaysia. Usul ini boleh dicapai melalui pembangunan Model Perniagaan Inovasi serta kaedah pengukuran yang telah dihasilkan semula.

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CHAPTER 1

INTRODUCTION

1.1   Overview

This chapter explains and describes the overall organisation of this thesis which incorporates ten (10) items starting from the background, problem statement, research objectives, research questions, significance of the study, scope of the study, conceptual framework, operational definition and organisation of the thesis.

Innovation concept is not a new practice and it is still continue making a huge impact in various aspects in life. Innovation had become an important element in enhancing economic performance, social welfare and environmental sustainability (Borins, 2001; ANAO, 2009; Onder & Nyadera, 2019). There are various conceptual views by scholars and researchers pertaining innovation (Erciş & Ünalan, 2016). It created a wide spectrum comprising both conceptual and technical elements (Mulgan & Albury, 2003; Ettlie & Rosenthal, 2011; Mustafid & Anggadwita, 2013).

In Malaysia, innovation driven for enhancing economy through national level policies. All parties such as the government, private sector and the citizens are positioned in an inclusive economic plan (ETP, 2010). The public sector plays a pivotal role in shaping and aiding national policy implementation with innovation initiatives.

Therefore, this research attempts to provide an insight of the innovation landscape in the public sector and to propose a new model that corresponds to current growing needs in the Malaysian Public Sector context. It is to facilitate innovation initiatives in the public sector in conjunction with the nations' fast and radical change

agenda since year 2009. The ever-evolving citizen expectations, expanding industry needs, demographic change and globalisation are challenging public agencies to operate differently, dynamically, and responsively. Increasing demand has become the general expectation where the needs for customisable services based on the current lifestyle of the civil society or described as the 24/7 society requires services to be available and accessible at all times (Lekhi, 2007). These demand forces the public sector to migrate from previous way of doing things by pushing innovation at various aspects of service delivery.

1.2 Background of the Study

This research was motivated by the current near stagnancy state of public sector innovation as compared to period 2009-2012 where innovation initiatives were aggressively rolled out. Adding to this, even empirical based inquiry was still at infancy especially public sector wide studies. Bureaucratic nature of the public sector requires more studies and initiatives in order to progress the sector towards enhancing innovation.

In the public sector context, innovation positioned at the heart of the service delivery system. Innovation could be implemented through many means and strategies. A quick glance into the literature reveals multiple types and strategies that are employed by organisations such as radical innovation for large scale change and fast results and incremental innovations for low risk and small changes.

Cascading further to implementation and operational level, it is crucial to realise that the objectives and the mechanisms in public sector are complex in nature. The complexity that the public sector deals were stressed by (Hughes et al., 2011), (Lewis & Hartley, 2001), (Crepaldi et al., 2012), (Ramli et al., 2016) where it exists within a complex social system, with goals and values that are ambiguous and difficult to quantify. The literature strongly suggests that innovation in the public sector is different from the private sector because of its main objective which is efficiency

where else the latter is profitability. (Tidd, 2001; Hartley, 2005) observed that with these complexity, public sector innovation remains fragile and failure prone.

Apart from the complexity, issues of implementing innovation in the public sector also involves technical aspects. Colville and Carter highlighted this in implementing effective innovation (Osborne & Brown, 2013). Thompson (1965) earlier had commented on the bureaucratic environment that makes it hard for fostering innovation in the public sector and this is still the status quo (Borins, 2002; Parsons, 2006; Potts, 2009; Cinar et al., 2019). Often, innovation results in failure. For evident, Hartley (2013) stated that the failure rate is 30% to 45% even in the private sector. It is expected higher in the public sector because of its size and complexity (Hartley, 2013; Sørensen & Torfing, 2012; Torfing, 2019; Siddiquee, 2019; Fei et al., 2019). But these issues should not hinder the public sector in progressing innovation parallel with changing environment. Rather, it requires for performance of innovation in the public sector to be studied for improvements.

1.2.1 Context of the Study

In understanding the phenomenon, the complexity of public sector involving multiple dimensions need to be revealed, identified, discussed and addressed. Conceptually, innovation in both private and public sector might seem not very different because it is compared in terms of quality of service, efficiency, customer satisfaction and trust (Ramli et al., 2016). But there are many more elements need to be considered beyond this output-based perspective.

Going back in time historically, the Malaysian public sector had been improving its systems and procedures continuously since the 90's through modernisation and reform initiatives by introducing new policies, management practices, developmental leadership visions, work systems and procedures. It has introduced series of administrative reforms and innovations to increase the capacity, efficiency and effectiveness of the administrative machinery. Some of these initiatives were Privatization, Look East Policy, Malaysia Plan, Development Administration

Circular (DAC), Total Quality Management (MAMPU, 1992), International Organization Standard (ISO) and many more (Sanusi, 1997; Siddiquee, 2007). These initiatives were driven by long term vision and implemented on continuous improvement incremental approach. These were the scenario then. Long term policies were also crafted to align the direction and operation of the public sector namely Vision 2010, Industrial Master Plan, National Biotechnology, National Science And Technology Innovation Plan, Industrial Master Plan, and New Economic Model. All of these policies required the public sector to operate like private sector entities by removing bureaucracies. Most innovation initiatives in the public sector are overseen by Malaysian Administrative Modernisation And Management Planning Unit (MAMPU) as the central agency responsible for modernisation (MAMPU, 2016).

As the evolution and progress of administrative improvement were briefly introduced, it is clear that a middle-income country like Malaysia had no other options but to rely on innovation as the catalyst for greater efficiency and economic performance. Thus, resulting Malaysia to embark on innovation related policies through Science and Technology Development policy under the 8th Malaysian Plan (Bekhet & Latif, 2017).

1.3   Problem Statement

Assessing from the policy directions, the way government operated in the previous decades could not cater current growing and complex needs of the dynamic civil society. This situation well acknowledged by the government and change was what the country need. Change and indeed fast change was required. A phenomenon that could bring revolutionary changes to the service delivery system.

Moreover, developing country especially Malaysia faces great pressure poised by stiff competition among countries in attracting foreign direct investment (FDI), global rankings, increasing stakeholder expectations and globalisation. These also contribute to the complexity of current scenario. Similarly, governments all around the world are in such pressure to deliver services efficiently.

Resulting from the external pressure, Malaysia needs to stay competitive and avoid being left lagging behind in order to strengthen the economy. Therefore, the country must progress and reform service delivery system to achieve sustainable development, improve perception in global rankings and avoid the middle-income trap as suggested by The Global Competitiveness Report in 2014. It is generally understood that a middle-income country like Malaysia had no other options but to adapt to the changing environment and advancing society. Clearly, change process is adamant and Malaysia is racing against time in achieving Shared Prosperity 2030 that was envisioned by the country's leadership, let alone outperforming the economic competitors.

In terms of global ranking, securing a position for Malaysia was indeed challenging and it is in a declining trend. In World Competitiveness Yearbook by Institute of Management Department reported Malaysia's ranking was 14th place in 2015, 19th place 2016, 24th place in 2017, and 22nd place in 2018 and 2019. Whereas in Global Competitiveness Report by World Economic Forum, the country was in 18th place in 2015, 25th place in 2016, 23rd place in 2017 and 25th place in 2018. Doing Business by World Bank reported Malaysia was in 22nd place in 2015, 23rd place in 2016 and further declined to 24th place in 2017 and 2018, 15th place in 2019 and 12th place in 2020. As the country's ranking are unstable with high fluctuation trend, it poses a negative effect on the country's competitiveness as well as in attracting FDIs.

Transformation was the direction and applied in the public sector as it supports the private sector; the engine of growth (NEAC, 2010). Responding to this, innovation agenda was centred through nationwide initiatives. National level economic programs, government transformation plan, innovation strategy, financial aids to entrepreneurs and new agencies with innovation portfolio were among the items on the performance targets. With these rigorous nationwide initiatives for half a decade, The Global Innovation Index 2015 (GII, 2015) reported that Malaysia was considered among countries that have the potential to outperform their peers in economy. Technology gap is narrowing between developed and developing countries through innovation performance relative to the development results from links between performance and innovation policy. National innovation policies and institutional arrangement are

found effective in low- and middle-income countries as concluded by GII (2015; 2019).

GII is measured by at least 10 percent improvement in Gross Domestic Product (GDP). It is based on the innovativeness of the country and these countries are called innovation achievers. Among the improvement areas are institutional framework, skilled labour, tertiary education and innovation infrastructure. The GII report measures four main pillars that are Innovation Input Sub-Index, The Innovation Output Sub-Index, The Innovation Efficiency Ratio and The Overall GII score. Innovation Input Sub-Index covers five input pillars namely Institutions, Human Capital & Research, Infrastructure, Market Sophistication and Business Sophistication. Innovation Output Sub-Index focuses at two output pillars namely Knowledge and Technology Outputs and Creative Outputs. The current score for every pillars as presented in Figure 1.1.
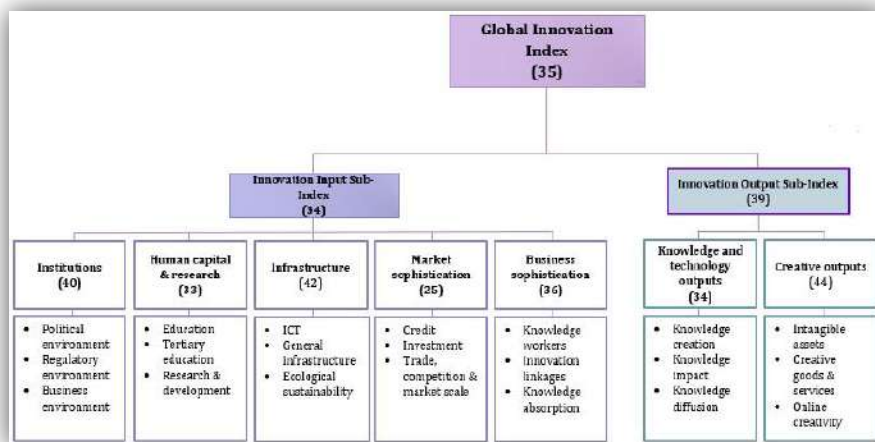
Figure 1.1   The Measurement Framework of GII (MASTIC, 2019)

Based on the report, Malaysia had been an innovation achiever since 2011 where there are potential in innovation performance. However, the ranking of the country had been deteriorating. In 2012 Malaysia was ranked 32th out of 141 countries. It remained at the same spot in 2013 out of 142 countries. Malaysia's position fell to 33rd spot among 143 countries in 2014, 32nd among 141 countries in 2015, 35th among 128 countries in 2015, at 37th among 127 countries in 2017, and settled at 35th among

126 and 129 countries in 2018 and 2019 respectively. Remarks and comments from the global international report are summarised as in Table 1.1.

Table 1.1   Global Innovation Index Report Summary on Malaysia

Strength	Weaknesses	Recommendation
Malaysia is closing the gap through the following areas: **Credit & Investment** • Economic competition • Market sophistication • Business sophistication • Performance and good business practices or innovation policies • Removing structural obstacles to innovation - Ease of starting a business • Strong commercialization in business R&D **Knowledge & Technology** • Creation, impact, and diffusion of knowledge • Acquisition and transfer of knowledge • Knowledge and technology outputs • Knowledge-based activities **Education and R&D** • Human capital and research • Strong basic infrastructure • Consistent promotion incentives • Establishment of National Innovation Agency	Poor performance in innovation efficiency shows a need to review government policies: • Execution of government sponsored R&D funds • Financing of innovation and commercialization • Knowledge-based activities • Reducing technological dependence	There should be greater effort made to improve efficiency of the innovation inputs and outputs: • Institutional support • Knowledge-based activities • Turn Malaysia into a net exporter of technology and services The most pressing are as below: • **Knowledge workers and Innovation linkages** • **Knowledge and technology outputs**

Malaysia needs to improve the weaknesses as reported by the international report (GII, 2015; 2019) and it is regarding the innovation efficiency aspect. As mentioned, domestic innovation capability needs to be strengthened in order to overcome the shortcomings. These are confirmed by its low scores in Knowledge workers, Innovation linkages, and Knowledge creation. These are typical issues for net importers of technology; in these cases, developing domestic innovation capabilities is needed to move from absorbing foreign knowledge and technology to creating domestic new knowledge and technologies.

Innovation index is aimed at gauging the innovation rate at the national level where it consists of the both private and public sector elements that are business market

condition and policy efficiency. The issues are, it possesses a good guide towards the overview of a country but it lacks focus and too complex to perform as it encompasses a wide spectrum of discipline and subject matters. It does not address operational issues of public sector organisations and the advancement of organisational capabilities. The pillars are interwoven between both private and public sector conditions. Moreover, the measurement does not dwell in the detailed view and data from both sectors as well as their contribution towards the ranking. It is more of coordination of policies towards facilitating innovation throughout a country.

Earlier in 2009, MOSTI introduced National Innovation Model. This model aimed to enhance Malaysia's strategic position and market niche by two main approaches. One is by Technology Driven Innovation (TDI) which emphasises funding science research and technology before identifying the suitable market. This approach estimated to consume more time and regarded as a long-term cycle of 10 to 15 years. The second approach is the Market Driven Innovation (MDI) which identifies the potential market and followed by acquiring technology. This is a more short-term mechanism which aimed to be completed by 3 to 5 years.

Current landscape reveals that the focus of the existing innovation model is the private sector, technology driven and did not directly acknowledge the role of public sector. The model was designed solely from an economic based perspective and built around funding, grants and market driven. Moreover, performance of this model is evaluated through financial indicators.

At this point, focus of the national innovation initiatives positioned on private sector, but from the GII report it is rather crystal clear that the improvements scored by Malaysia are contributed by public sector in terms of policies and regulation as well as reducing bureaucracy. It is a strong indication of the importance of the public sector agencies in improving country's performance.

Transforming the civil service is not an easy task as it requires change at all levels. It involves systems, processes, procedures, administrative power, structures, human resource and technology. Thus, the civil service must undergo change process

to stay relevant and capable to cater today's needs of the citizen and industry. Radical innovation was promising where it involves forgetting how work was done and discovering how it can be done at the present moment (Hammer & Champy, 1993). In line with the government's direction to improve its services, government agencies had been urged to cut graft, red tape and speed up their processes. The public sector agencies are urged to innovate and improve their operations.

In 2009, the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) had undertaken an important measure in helping government agencies to improve their services through Business Process Reengineering and e-government online services. Subsequently, targeted digitalisation agenda in 11th Malaysian Plan (2016-2021) overseen by 14 different entities comprises of ministries and agencies. This initiative was still at infancy and needed to be supported with the current Malaysia Digital Economy Blueprint (launched in 2021). However, despite all the planning's and targets, the public sector seemed to be disoriented in action.

Even though innovation was made as the focus of the government in policy agenda, the **main problem** is there exist a gap in finding an appropriate model in implementing innovation in the public sector as compared to the private sector (Bloch & Bugge, 2013; Hsieh, 2008) and Malaysia is no exception to this condition (Thiruchelvam, 2015). Public sector innovation is the under researched field in both practical and knowledge areas. Therefore, going about understanding innovation in the public sector is a huge gap knowledge (Bugge et al., 2011; Kattel et al., 2013).

Firstly, many researchers such as (Clausen et al., 2020; Klimentova, 2014; Pekkarinen et al., 2011) stressed the current underresearched state of the public sector domain. One of the main reasons for this situation is the lack of maturity in public sector innovation research. Empirical research is still at its surface even innovation in the public sector had long taken off. Most references are based on foreign case studies such as the National Health System (NHS) case in the UK.

Secondly, there are limited materials, established guidelines, frameworks and models addressing the public sector innovation landscape let alone being empirically measured. In the academia, public sector innovation-based researches are very scarce. As searched in major online databases (Emerald in September 2016) there are roughly only about 586 references in this subject, and got lesser to 276 when related to policy. Whereby, innovation measurement related materials only returned 80 references.

Thirdly, absence of public sector wide study is evident in the Malaysian public sector. After years of quality initiatives, administrative reforms and service delivery improvements, there are several important issues are yet to be addressed. Implementation and performance of innovation agenda could be questioned in the public sector despite having heavily budgeted. Important factors that have influence are not clear and undiscovered. Information on current level of effectiveness and efficiency of the innovation performance also not widely available. Public sector agencies barely share nor publish these kinds of data for confidentiality reasons.

Fourthly, innovation implementation often carried out at the high-level macro policy. Institutional strategies and activities that agencies employ in going about planning and implementing innovation often not addressed in the Malaysian case. Formulation of effective innovation strategy in improving performance is also not in place. This could only be spotted from small number of innovative agencies such as the Immigration Department, National Registration Department, Road Transport Department and Inland Revenue department. Fifthly, impact of innovation towards organisational performance is unclear. Without accustomed measurement instrument, the factors that made these abovementioned agencies perform could not be revealed. Factors that differentiate innovative agencies from others that are mediocre needs could not be identified hence indicating gaps in innovation impact measurement. Sixthly, Malaysian public sector innovation is in dormancy as compared to year 2000-2012 period and there is a serious need to study the landscape, effect, behaviour, practice and performance of the Malaysian public sector to avoid unnecessary waste of opportunity cost, time, fund and effort as well as opportunity in improving service delivery. Without careful planning and innovation, the public agencies will only be

trapped in their bureaucratic routine without improvement in the institutional framework, organisational effectiveness and business model.

Lastly, worse enough, there are no concrete and dedicated models for the innovation policy implementation in public sector. This study attempts to study the organisational aspect of public sector agencies, examine the existence of innovation related factors, measure them and integrate into a model. This is highly possible because (Subramanian & Nilakanta, 1996; Akman & Yilmaz, 2008; OECD, 2014) confirmed that innovative organisations have identifiable organisational characteristics that distinguish them from their non-innovative counterparts (Damanpour, 1987).

1.4   Research Objectives

Ultimate goal of this study is to establish an empirical insight in the under researched public sector. As current gaps concluded need for scientific measures and practical business model that could serve as an additional option to the public sector. At least 1000 agencies under the purview of 25 ministries in Malaysia could attempt to implement the proposed model because it operates in the same system, culture and geographical location. As UK's National Endowment for Science, Technology and the Arts (NESTA, 2009, p.5) stressed: "...*you cannot make a convincing case for greater innovation if you do not know the scale of innovation currently taking place. And you cannot control – or even reliably influence – what you cannot measure. In addition, measuring innovation is not an end in itself. The measure has to lead to ways of improving the management of innovation and its contribution to economic and social wellbeing*".

This research has a similar footing where it is aimed in investigating the innovation landscape of the whole public sector, measuring crucial factors and develop a working model. Therefore, this research has the following objectives:

(a)   Objective 1: Examine the impact level of Innovation Management, Innovation Capabilities, Innovation Performance and their interactions in Malaysian public sector.

(b)   Objective 2: Evaluate the role of Innovation Capabilities as mediator between Innovation Management and Innovation Performance.

(c)   Objective 3: Determine and measure the most impactful construct that influences Innovation Performance in the Malaysian public sector.

(d)   Objective 4: Determine and propose an appropriate innovation business model for Malaysian public sector agencies.

1.5   Research Questions

This research attempts to clarify the current reality of the Malaysian public sector pertaining to Public Sector innovation. The following research questions needs to be addressed in meeting the research objectives.

(a)   What is the impact level among Innovation Performance, Innovation Capabilities and Innovation Management in the Malaysian Public Sector?

(b)   How significant is Innovation Capabilities as a mediator between Innovation Management and Innovation Performance?

(c)   What is the most influential construct towards Innovation Performance in the Malaysian public sector?

As a result, this research involves testing a total of four hypotheses based on the literature review, research objectives and research questions. These hypotheses are constructed based on the relationship and interaction as discovered by many researchers. The hypotheses are organised as in Table 1.2.

Table 1.2   Research Hypotheses

No	Hypothesis	Objective	Question
1	Innovation Capabilities has a positive and significant influence on Innovation Performance.	1	a
2	Innovation Management has a positive influence on Innovation Performance.	1	a
3	Innovation Management has a positive and significant influence on Innovation Capabilities.	1	a
4	Innovation Capabilities mediates the relationship between Innovation Management and Innovation Performance.	2	b

Hypothesis 1, 2 and 3 is aimed in revealing the current innovation landscape of the public sector. Firstly, it measures all related parameters and their magnitude which are translated as impact level. Impact level will show the current innovation level. Secondly, interactions among the parameters where the influence of one parameter towards others are measured backed by theories. Thus, addressing concerns of Research Question a. Hypothesis 4 measures the assumed role of Innovation Capabilities as mediator between Innovation Performance and Innovation Management. By comparing the regression path with and without the influence of Innovation Capabilities, Research Question d on mediation effect is confirmed.

In achieving all of the Research Objectives, this research examines all public sector ministries in 2019 of their innovation practices. In that sense, it includes both innovators and non-innovators. Both types of ministries shall have their organisational aspects be analysed and derive underlying innovation business model that are in practice. This is in line with the Oslo manual approach which studied both type of public agencies to have a holistic view of the sector.

In addition, Borins (2001) mentioned the approach of identifying innovator agencies are through innovation awards. It involved using large samples of innovations identified by innovation awards to generate and test hypotheses about the process of innovation (Borins, 2002). In the Malaysian public sector, innovation awards are openly organised and participated by agencies from various ministries annually. By

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default, it is organised intra agencies annually. This administrative practice is an advantage in investigating the intended population where all agencies involved in the process.

1.6 Significance of the Study

This study aims to develop an innovation business model to guide public sector agencies in improving innovation performance. As innovation positioned as nationwide agenda, therefore there is a need for dedicated model to serve as a foundation in planning, implementing and measuring innovation policy. At the moment, reference in this particular area is scarce. Currently, agencies implementing innovation related activities through central agency directives and circulars, at the expense of potential unique resources. There exists gap in between field practice and centralised directives. Outcome of this research expected to close this gap. Contribution in enhancing policy efficiency, and knowledge base expansion in the academia are expected from this research.

1.6.1 Enhancing Policy Efficiency

Findings of this study shall have impact on agencies in enhancing the efficiency of innovation related activities. By way of investigating and measuring the public sector innovation landscape, a baseline for practice and the significance are addressed. It reveals the actual inner workings and current effectiveness in an empirical form. As concept of innovation is seriously being injected into the service delivery systems and processes, the policy makers could utilise the output of this research as a complete guideline for implementing innovation precursors for achieving operation excellence by optimising resources. It also potentially reveals several implications in the organisational performance context which is the service delivery of the public sector and research opportunities in improving the current state of performance. Ultimately, this research proposes a working innovation business model in the Malaysian context as a strategic management tool.

Secondly, by measuring existing innovation landscape the impactful construct that has significant effect on innovation performance is identified and given priority in policy endeavours. Activities in policy planning, implementation and evaluation could be orchestrated in accordance. Greater coordination and content management could be crafted by central agencies that are responsible in modernising public sector.

Thirdly, from strategic point of view, the effectiveness of different approach in implementing innovation in the Malaysia case could be compared and contrasted. This could enable agencies to determine the most appropriate and effective strategy that has significant positive effect towards innovation performance. Nationwide innovation initiatives could incorporate the appropriate strategy to ensure high probability of implementation performance. It also has the potential in enhancing quality of the public sector service delivery to the nation.

Fourthly, the model could upgrade the level of intellectual and scientific evidence-based management in Malaysian public sector. It shall serve as an innovation scientific measurement tool with indexes and indicators in gauging innovativeness of public sector agencies. It could pave the way for formalised mechanism in continuously measuring and monitoring level of agency innovation governance, Innovation Performance, Innovation Capabilities and Innovation Management. Fifthly, this kind of empirical insight could well be an initiator for better research in a larger spectrum to take shape thus addressing the under-research state of public sector innovation.

1.6.2 Knowledge Base Expansion

In the academic research field, this research contributes to new knowledge creation in multiple areas. This can be realised in terms of development of a new model, new measurement instrument, application of new theoretical footing, wide sector study approach, new categorisation of innovation dimensions, adoption of internationally established constructs, new primary data, information on the public sector innovation landscape and changing trend in innovation.

Development of an Innovation Business Model for the public sector opens a new dimension in public sector domain. This has moved the traditional ossified perception of public sector (Torfing, 2018) to a more contemporary and strategic organisations. Public sector can no longer solely rely on central agencies directives in implementing innovation which often takes time for expansion and new practice to be in place. At the same time, innovativeness potential in organisations could be yield and capitalised. Moreover, scholars and researchers shall have new data, information, knowledge and unique application of business model theory in the under researched public sector field especially in Malaysia. By establishing the appropriate business model, the level of knowledge in the innovation domain could be enhanced, increased and widely put into action and tested elsewhere.

Current research contributes additional input for practitioners to formulate practical ways to engage and deal with organisational aspects in innovation initiatives. It reveals important cultural and geographical associated factors that are unique in the Malaysian case. Common factors that are related to innovation are tested in the Malaysian setting and their relevance presented empirically. This shall provide a clear picture of the public sector organisational behaviour.

Current research lays out the level and effectiveness of radical innovation and open innovation in Malaysia. Contribution in theoretical advancement is highly possible where these two main elements are regarded as types of innovation in the literature but with vague definition and application. This research provides a new categorisation where radical and open innovations are regarded as strategies rather than innovation archetypes. This aspect further expands the dimension of innovation and concurrently providing new perspective for researcher in analysis.

Lastly, this study provides an internationally adopted and locally accustomed public sector measurement model which synthesises elements from other countries for functionality fit in the Malaysian context. New measurement instrument was rediscovered, established for gauging the public sector innovation landscape. This aspect enriches the understudied domain with new and current measurement with international framework adoption. Hence, enhancing and expanding its applicability.

This shall contribute findings and expands current understanding on areas of improvement in framework adoption for local benefits.

1.7   Scope of the Study

Investigation of innovation landscape involves Ministries in the public sector organisations. Ultimately, whole of Malaysian public sector serves as the landscape of this research. It is a three-layer government structure with federal government consists of ministries, state government and local governments. As innovation initiatives are a nationwide agenda, all agencies in the public sector are suitable for this research. However, to maintain focus, only federal ministries are included in this research. This is due to the role of ministries as the focal point for national policy and strategies. Moreover, this research is bounded by limited timeframe to be completed. Respondent population are middle managers in the ministries whom deals with policy implementation. Respondents from this level could provide a holistic view because of their interaction with various groups of entities namely top management, operational staffs, suppliers, customers and the general public.

1.8   Conceptual Framework

This research is a combination of confirmatory, exploratory, correlational and descriptive research as it is an attempt to discover the **landscape**, the **influence** of the independent variables as well as the **significance** posed towards the dependent variable. These interactions are connected by underpinning theoretical footing.

In terms of theoretical footing, this research adopts and integrated three main theories that are Resource Based View (RBV)'s dynamic capability theory, learning organisation theory into business model theory. This integration itself is a radical innovation in conducting public sector research and produces a dynamic contemporary model for the Malaysian public sector.

In concluding this, conceptual framework is used to depict overall model consists of variables in research (Sekaran, 2007). It presents the interaction between dependent variable, independent variables and mediating variable derived from the literature. Current research utilises a Resource Based Value perpective where organisations are centered as the source of innovation. This includes the key resources of an organisation such as people, process and technology. The conceptual framework for this research is as shown in **Figure 1.2**. Basically, Innovation Performance in the public sector is projected to be influenced by Innovation Capabilities and Innovation Management. These are two independent variables and one dependent variable represent the innovation landscape. Organisational elements that are Innovation Strategy and Innovation Activities makes up the Innovation Management construct. The conceptual framework were adapted from previous study (Ramli, 2016) with similar settings.
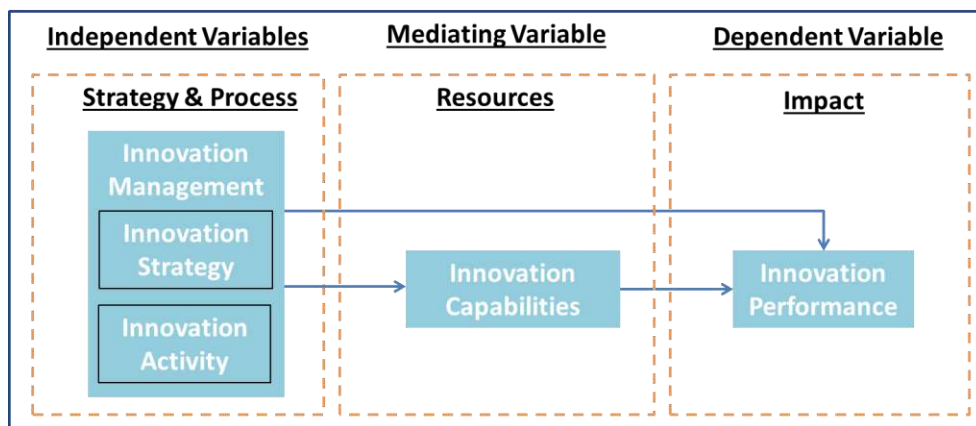
Figure 1.2   Research Conceptual Framework (Abdullah, 2019)

Two independent variables consist of Innovation Management and Innovation Capabilities believed to influence dependent variable that is Innovation Performance. Interaction of these factors are in a process view with strategy and activities as internal processes, capabilities as key resources, and performance as the output. In this setting, Innovation Capabilities functions both as a construct and **mediator** between Innovation Management and Innovation Performance. The framework integrates the Innovation Strategy and Innovation Activities as organisation internal factors that

interacts and drives Iinnovation Management. This research investigates, attempts to model and explain the interactions in public sector innovation landscape.

1.9   Operational Definition

Operation definitions utilised for this research are presented in this section. A broader innovation definition is being employed mainly because of the diverse nature of the public sector and its complexity. The version suggested by the Oslo Manual by OECD in 2005 are utilised in this research as it is widely accepted internationally especially in the public sector. Global Innovation Index utilises this definition as well. Oslo Manual Third Edition defined innovation as "An innovation is the implementation of a new or significantly improved product (good or service), a new process, a new marketing method, or a new organizational method in business practices, workplace organization, or external relations" (OECD, 2005, p. 46). This definition also in line with (Baregheh et al., 2009) whom had reviewed more than 60 definitions and suggested innovation as the multi-stage process whereby organisations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace. The complete list of operation definitions utilised for this research are as follows:

Impact Level: Describes the magnitude of influence posed by a construct.

Innovation: Refers to the implementation of a new or significantly improved product (good or service), a new process, a new marketing method, or a new organisational method in business practices, workplace organization, or external relations (OECD, 2005).

Public Sector Innovation: the creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in the outcome efficiency, effectiveness or quality (Mulgan & Albury, 2003).

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Innovation Activities: Describes the process of innovative idea flowing through an organisation until implementation (Hughes et al., 2011).

Innovation Capabilities: Describes key underpinning organisational resources that influence innovation in organisation. (Hughes et al., 2011).

Innovation Management: is the discipline of managing processes in innovation (Şimşit et al., 2014). It describes the key processes and activities of organisation pertaining to innovation consists of Innovation Strategies and Innovation Activities.

Innovation Performance: Refers to innovation output and outcome towards effectiveness and efficiency aspects of organisation such as speed of service delivery, quality, cost, time, flexibility, culture, public value, trust, customer satisfaction (Bugge & Mortenson, 2011; Hughes et al., 2011).

Innovation Policy: Refers to initiative, planning, program, projects or directives by the government entities pertaining to innovation.

Innovation Strategy: Describes the approach, method, and different types of innovation utilised by organisation based on internal planning or central agencies directives.

Policy Implementation: Involves cascading and translating the objectives of a policy into initiatives, programmes or projects.

Public Sector: Refers to ministries and their agencies as well as central agencies in the Malaysian Public Sector responsible for service delivery.

1.10   Organisation of the Thesis

Organisation of the thesis are outlined in this section to assist the readers to get an overall picture of the research. It comprises a total of five (5) chapters beginning with Chapter 1, which introduces overview of the study, background of the study, problem statement, research objectives, research questions, and significance of the study, scope and limitations as well as definition of terms used in the study. Chapter 2 sets the context by analytical review of innovation from multiple view namely definition, conceptual view, dimensions, public sector innovation, Malaysian public sector innovation, and innovation related policy implemented in Malaysia. The review also focuses on advancement of innovation policy in Malaysia, strategies, past and current approach in Malaysian public sector. Theoretically, the chapter established connections between constructs in this study, provide insight on existing measurement models as well as rational for innovation measurement. Subsequently, Chapter 3 detailed the research methodology as well as rational for adopting current research design, paradigm, approach, strategy and theoretical footing. Adding to this are statistical details of population selection, sampling, development of research instruments, pre testing, pilot test outcome and refinement of research instrument. Data collection and the types of data analysis carried out to make sure all the data are reliable and the findings are valid.

Chapter 4 deals with data analysis in a sequential manner from data editing, screening, coding, performing descriptive analysis, factor analysis, reliability testing, and structural model testing. Ultimately, Chapter 5 discusses the findings of the research and made necessary conclusions as well as recommendations, implications, and suggestions for future research. Thesis ends with list of references and appendices.

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LIST OF PUBLICATIONS

Journal with Impact Factor

1. Abdullah, M.Y, & Ariffin, A.S, (2021). Measuring Malaysian Public Sector Innovation Performance Through Business Model Perspective. International Journal Of Social Science And Human Research. 4(12), 3568-3578 (**Q4, IF:5.586**)

Non-Indexed Journal

2. Ramli, R.I, Abdullah, M.Y, Ariffin, A.S, & Hassan, N. (2016). The Myth of One Size Fits All in Understanding Public Sector Innovation. JoSTIP, 2(1), 31–38.

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1. Abdullah, M.Y, (2019) Innovation Business Model Development For Public Sector Towards Innovation Policy Implementation In Malaysia. Perdana Policy Research Seminar @ Perdana PRS2019

2. Abdullah, M.Y, (2018) Innovation Business Model Development For Public Sector Towards Innovation Policy Implementation In Malaysia. Perdana Policy Research Seminar @ Perdana PRS2018