Corporate Future Foresight in Government: A necessity or a luxury?

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Corporate Future Foresight in Government: A necessity or a luxury?

By

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Service Leadership and Innovation

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Dedication

To my Mom and Dad for your endless encouragement

To my family who supported me along the way

To my husband, Fadeel for making everything possible

I would like to thank Dr. Jennifer Matic for her guidance and support through this journey. And I would like to thank my RIT-Dubai COHORT for their support and warm wishes.

Special thanks to my dearest friends, Rana and Ruba for their help when most needed.
In the era of continuous change, governments increasingly find themselves in the face of growing uncertainty and increasing need for future foresight. This research aims to test the relationships between the corporate future foresight maturity level, environmental hostility level and the value contribution of foresight activities in government entities in Dubai. Adopting a quantitative approach, 39 government entities participated in the cross-sectional survey used in this research. The results show that there is a significant positive relationship between the future foresight maturity level among government entities and the value contribution of foresight activities. Also, the results revealed no significant relationship between environmental hostility level and the value contribution of foresight activities. Additional findings revealed a high need for integrating future foresight activities with low competition intensity, high technological and market turbulence in government’s contextual environment. Also, they revealed a better practice level in future foresight practices among government entities. This research is concluded by discussing the results, highlighting their academic and practical contributions, understanding the study’s limitations and recommending areas for further research.

**Keywords:** Future foresight, corporate foresight, foresight maturity, value contribution, government future
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Introduction

To thrive in the future, organizations must have the capacity to create an environment that nurtures future foresight (Constanzo & Mackay, 2010; Peter & Jarratt, 2015; Rohrbeck 2012). Future foresight is defined as the organizational efforts directed towards understanding and continuous learning about the future and its possibilities (Slaughter, 1995; Tsoukas & Shepherd, 2009). Organizations need to envision the long-term goals and build mechanisms today to probe the progress towards the desired future (Abell, D., 1999). Thereby, organizations will be able to broaden the scope of strategic thinking and look at business from various angles. On the other hand, the means of building a foresight-driven culture need to be established so that organizations can keep pace with the increasing speed of change.

Government organizations are increasingly inclined towards shaping their futures (Borch, Dingli, & Sogaard Jorgensen, 2013; Conteh, 2014; Kuosa, 2012). Interest in integrating future foresight in the public administration sector is rising as the surrounding environment shows growing levels of uncertainty and ambiguity (Dreyer & Stangas, 2013; Marland, Walker, & Swain, 2016, United Nations Development Operations Coordination Office, n.d). However, many government organizations find themselves struggling behind as the world is changing at a faster speed (Sturesson, McIntyre, Cleal, & Jones, 2013). United Arab Emirates (UAE) is among the countries that adopted future foresight as a key focus area and therefore developed the UAE Strategy for the Future in 2015 and mandated corporate foresight activities among its government entities (mocaf.gov.ae).

In this study, the researcher adopts a quantitative approach with a cross-sectional survey method as a strategy of inquiry to test the relationship between the future foresight maturity level
in government entities, competitive intensity, technological turbulence, market turbulence in UAE and the value contribution of foresight activities. It tests the following hypotheses:

**H1:** The corporate future foresight maturity level is positively related to the value contribution of foresight activities.

**H2:** The environmental hostility level is related to the value contribution of foresight activities.

The first independent variable, corporate future foresight maturity level, is defined as the level at which the capabilities of understanding and learning about future possibilities are systematic and implemented across the organization (Presse, 2001; Slaughter, 1995; Tsoukas & Shepherd, 2009). The second independent variable, environmental hostility level, is defined the level of conditions that surround the government entities including competitive intensity, technological turbulence, and market turbulence. Competitive intensity refers to the extent to which organizations at certain industry put pressure on one another and limits its profit and market share (Porter’s five forces, 2013). Technological turbulence refers to the rate of change and advancement in the technology sector. Market turbulence refers to the level of change in the market including speed of change in customers’ preferences and needs and the stability level of economic climate (Market orientation, 2003).

The dependent variable, value contribution of foresight activities is defined as the possible positive benefits realized from implementing activities that are targeted towards future foresight in organization (Rohrbeck, & Schwarz, 2013).

The importance of this study stems from the need for hard evidence to show the effectiveness of future foresight in governmental sector context. The research hypotheses use the capabilities
maturity model rationale that enables the description of a process effectiveness (Presse, 2001). Showing the relationships between the hypotheses variables help in describing the effectiveness of the future foresight process in government entities. Additionally, government entities operate under budgetary constraints while they are expected to perform at their full potential, avoid predicted perils and manage unanticipated risks (Curristine, Lonti, & Joumard, 2007). Thus, understanding the nature of these relationships helps in supporting or challenging the investment in enhancing the future foresight maturity level, conducting foresight activities at government entities, and implementing mechanisms that probe the changes in the level of environmental hostility.

In the literature review, the researcher draws on documentations that support the research hypotheses, communicates the conclusions about how literature addressed the research hypotheses, and reveals the gap found in research in this subject of interest. In the method and evaluation section, the researcher explains the approach used in this study, identifies the population, sample and participants and their method of selection. She also explains the study’s instrument and data collection and analysis procedures. In the results section, the researcher introduces the study’s findings. In the discussion section, the researcher interprets the results and describes the contribution to the literature and the practical contributions. Lastly, the researcher clarifies the study limitations and provides recommendations for future research.

**Problem Statement**

The purpose of this survey study is to test the relationships between the future foresight maturity level, the environmental hostility level and the value contribution of foresight activities in government organizations in UAE. The independent variables are the future foresight maturity
level and the environmental hostility level. The dependent variable is the value contribution of foresight activities.

This study aims to contribute to the efforts exerted to enhance the government sector’s response to disruptive and discontinuous change and the ability to anticipate future trends in the transactional and contextual environments in which it operates. By understanding the nature of the relationship between these variables, there will be a hard evidence to support or challenge the direction towards investing in future foresight activities and the need for future foresight.

Moreover, by measuring the future foresight maturity level, there will be a better understanding about the current status of future foresight maturity level in UAE’s government and future foresight practices prevalence. Thus, help the government in directing its efforts to where they are needed the most and having a better return on investment. Also, measuring the environmental hostility level will reveal the perceived degree of intensity in each of the three factors included: competitive intensity, technological turbulence, and market turbulence in the UAE’s government sector. This will help in setting more proactive strategies. Additionally, measuring value contribution reveals the trends of positive benefits realized from implementing activities related to future foresight among government entities.

**Literature Review**

To many organizations, the increasing complexity and the growing uncertainty in the surrounding environment has limited their abilities to survive and thrive (Auh, & Menguc, 2005; Peter & Jarrat, 2015). Thereby, they find themselves in situations where the strategic direction had to shift from the linear, go with the flow, direction to a more divergent, explore all options, approach (Day & Schoemaker, 2005). Here, the researcher introduced key concepts related to the
study’s hypotheses and the problem under focus. Literature review of corporate future foresight concept, corporate future foresight environmental drivers, and corporate future foresight in government sector helped the researcher understand the surrounding environment of the study’s problem, showcase its importance and reveal how it was addressed by other researchers. Furthermore, literature review of maturity level of corporate future foresight and value contribution of foresight activities introduced the various mechanisms in which organizations constructed their foresight systems and deployed their divergent long-term strategies.

Corporate Future Foresight Concept

A review of the literature revealed increasing interest in understanding the concept of future foresight and its constructs (Rohrbeck, 2011; Slaughter, 1995; Tsoukas & Shepherd, 2009). The definition of corporate future foresight has been developing over the past decades. Slaughter defined foresight from an individual perspective as “opening to the future with every means at our disposal, developing views of future options, and then choosing between them” (1995, p. 1). Tsoukas and Shephard addressed the concept from its broader sense as “a refined sensitivity for detecting and disclosing invisible, inarticulate or unconscious societal motives, aspirations, and preferences and of articulating them in such a way as to create novel opportunities hitherto unthought and hence unavailable to a society or organization” (2009, p.22). Rohrbeck stated that foresight is “the ability to detect, interpret and respond to discontinuous change” (2011, p. 1).

The foresight literature highlighted two main concentrations in corporate future foresight activities: the long-term focus ranging for ten years or more, with the exception of high-speed evolving industries such as technology, and alternative paths for the future (Kuosa, 2012). However, other researchers focused on the importance of selecting the foresight topic and the
solutions needed to achieve the desired future (Borch, Dingli, & Sogaard Jorgensen, 2013). This implies different methods in implementing foresight activities; the first approach introduced by Kuosa aims to prepare organizations for future possibilities while the second approach offers practical steps which organizations can follow to achieve their desired future. In practice, these two approaches often used simultaneously to build full-fledged long-term strategies (Van der Duin, 2016).

Despite the different views of foresight concept, a consensus was found that it includes the skill of redirecting thinking towards more peripheral vision of corporate future and detection of signals as essential parts of it (Auh, & Menguc, 2005; Rohbreck, 2011). Therefore, corporate future foresight can be defined as the corporate capabilities of understanding and learning about future possibilities.

**Corporate future foresight frameworks.** Studies emphasized the importance of treating corporate foresight as system rather than a process (Battistella, 2014; Dufva & Ahlqvist, 2015; Peter & Jarratt, 2015). Researchers (Dufva & Ahlqvist, 2015; Sarpong & Maclean, 2016; Sarpong, Maclean, & Davies, 2013) used qualitative studies to explore how organizations established their corporate foresight systems and how they integrated them into the organizational ecosystem. They introduced elements including normative organizing structure, prominence of formal knowledge, and horizontal interactions among organizational structures (Dufva & Ahlqvist, 2015; Sarpong & Maclean, 2016; Sarpong, Maclean, & Davies, 2013). However, there is hardly any quantitative research that studied the relationships or effects among these elements.
The literature review of corporate future foresight system frameworks continued to explore how organizations deploy foresight frameworks with fewer findings about what their effects might be. It revealed that some organizations introduced a special unit for future foresight as a factor that cultivates future foresight activities, leadership recognition of foresight as a priority, formal and informal communication between units and signal detection activities (Battistella, 2014; Peter & Jarratt, 2015; Roherbeck, 2010). Others view foresight formulated through practice (Tsoukas & Shephard, 2004).

However, other scholars argued that having the responsibility of dedicated business unit for foresight limits the prospects of influencing the future compared to foresight operations that are closer to decision makers in organizations (Wilenius, 2008; Durst, Durst, Kolonko, Neef, & Greif, 2015). They tended to favor spreading formal knowledge and raising people’s competency in using foresight approaches and tools across various organizational levels rather than having it as a separate function in the organizational structure. Therefore, there is a need to link how well organizations activate such elements and their value contribution of foresight activities so more evidences can be introduced to support these various points of view.

The literature examined on foresight structural elements showed the need for further research that assesses these elements among organizations, and which determines what can contribute to the evolution or impediment of foresight driven organizations and maximize the value generated.

**Corporate Future Foresight Environmental Drivers**

As with other corporate management systems, corporate future foresight might be influenced by internal and external factors. Hiltunen (2013) argued that organizations have
internal motivators for foresight: the demand of business operation for the long term, and being proactive in innovation operations. The relationship between the need for long term perspective of business and the innovation process and the trend-based innovation has been addressed in literature by several studies (Corsi, & Neau, 2015; Hiltunen, 2013; Rohrbeck & Gemünden, 2011).

On the other hand, the external drivers for foresight activities such as avoiding surprises in the organizational surrounding environment, mapping information between products and future users, collaborating for innovative ideas, and changing the operational environment and strategy process has been identified (Hiltunen, 2013). Other researchers shared a similar perspective of external motivators including new rivals, technologies and regulations (Day & Schoemaker, 2005). Also, strategic foresight has been considered as a vital competence for businesses as new competitive landscapes quickly rise and demand agile and adaptive planning and seizing opportunities quickly (Tsoukas & Shephard, 2004). However, there is gap in testing the association between these factors and the benefits realized from corporate foresight activities.

Corporate Future Foresight in Government Sector

Foresight is traditionally perceived as applicable to science, technology, environmental studies and military; however, it is expanding to other fields such as public administration and policy making (Borch, Dingli, & Sogaard Jorgensen, 2013; Conteh, 2014; Kuosa, 2012, Tully, 2015).

The literature review revealed that foresight contributes to the advancement of the government sector (Conteh, 2014; Kuosa, 2012). It informs decision makers to favor policies that help in shaping the desired future and acts as an overarching vision for governance (Conteh,
Moreover, foresight contributes to policy making in three levels; gathering systematic forward knowledge, enhancing “reflexive mutual social learning among policy makers”, and having better future vision and strategies (Kuosa, 2012, p. 138). These benefits would help governments to foresee demographic changes and other public trends and address problems before they become prominent.

It has been argued that governments’ solo focus on current issues without considering the emerging threats and opportunities often resulted in hindsight and improvidence of actions (Kuosa, 2012). On the other hand, the United Nations Development Operations Coordination Office (UNDOCO) offered several cases showing foresight as a tool to assist multi-year strategic planning and enhance lateral problem solving in governments (UNDOCO, n.d). They argued that foresight can help in preventing organizations from the solo focus on internal issues, reaching convergence on solutions prematurely, and over assurance about future (UNDOCO, n.d). They also discussed that with increased volatility and uncertain conditions, organizations as well as governments find themselves in positions where they need to be prepared for multiple scenarios (UNDOCO, n.d). Tully (2015) also argued that strategic foresight is a critical tool to help governments perform better and have an effective governance.

In conclusion, there are several studies that show the importance of foresight in governments and that responds to the increased interest in future foresight in this field. However, there is a gap in literature in studies that test foresight models in governmental context. Therefore, this study adds to the current body of knowledge in future foresight field in the context of government environment.
Maturity Level of Corporate Future Foresight

Researchers have been exploring the key elements of corporate future foresight to formulate the structure that can help organizations implement foresight activities systematically. Organizational culture was addressed as a key element in supporting corporate foresight attitudes among organizations (Peter & Jarratt, 2015; Rohrbeck & Gemünden, 2011; Shamiyeh, 2010; Tsoukas & Shephard, 2004; Wilenius, 2008). Wilenius (2008) highlighted the importance of having a direction to look for opportunities and options to change rather than waiting for change to happen. Shamiyeh (2010) addressed the importance of design attitude in leadership as it works best in ambiguous environments and uncertain conditions. Additionally, researchers highlighted the importance of active engagement of employees in searching for novelty in processes, products and services in building a foresight driven culture (Shamiyeh, 2010; Von der Gracht, Bañuls, Turoff, Skulimowski, & Gordon, 2015; Wilenius, 2008). These individual studies contributed to the emergence of capability maturity models in the field of future foresight.

The Capability Maturity Model (CMM) is broadly used to describe the characteristics of process effectiveness. The first model was developed by the Software Engineering Institute (SEI) of Carnegie-Mellon University in Pittsburgh in the mid-1980s (Persse, 2001). SEI stated that the CMM can be used to assess an organization in a subject area against a scale of maturity levels and each level rank resembles how much the organization has developed its processes from ad-hoc practices to structured and managed steps (Presse, 2001).

Research showed that the CMM has been implemented in various subject areas such as software management, innovation, and future foresight (Corsi & Neau, 2015; Kononiuk & Sacio-Szymańska, 2015; Persse, 2001; Rohbreck, 2011; Rohrbeck, Jissink, & Huizingh, 2015). It also revealed future foresight maturity models including the Foresight Maturity Model (FMM)
developed by Terry Grim, and the Maturity Model of Corporate Foresight (MMCF) developed by Rene Rohbreck (Grim, 2009; Rohbreck, 2011). The authors of both the FMM and MMCF followed the practice of building maturity models by including definition of maturity levels to enable judgment of the level of each foresight capabilities (Downing, 2013).

However, MMCF has been used in a larger number of published studies related to the future foresight subject area. Additionally, this maturity model was developed based on a sample from multiple industries with different position in the value chain, and primary business driver, which made it possible to research the same phenomenon in different companies (Eisenhardt & Graebner, 2007; Rohbreck, 2011). Hence, the researcher preferred to use this model for this study.

The MMCF consists of three major parts: context, capabilities, and impact. See Figure 1. Context addresses the need for corporate foresight by examining the organization’s surrounding setting including size, strategy nature, competition, environment complexity and industry change pace. Capabilities are organized into five dimensions: information usage, method sophistication, people and networks, organization, and culture (Rohbreck, 2011). Impact is structured into four categories; reduction of uncertainty, triggering actions, influencing others to act, and secondary benefits (Rohbreck, 2011).
The maturity level of future foresight is defined as the level of proficiency among the five capabilities: information usage, method sophistication, people and networks, organization, and culture (Rohbreck, 2011). As per the MMCF there are four level of maturity; level 1 as rudimentary, level 2 as better practice, level 3 as good practice, and level 4 as best practice (Rohbreck, 2011, p. 94).

![Figure 1. The maturity model of corporate foresight. Reprinted from Towards a Maturity Model for the Future Orientation of a Firm Context (p. 72), by R. Rohbreck, 2011. Reprinted with permission.](image)

**Value Contribution of Foresight Activities**

Research addressed the value contribution of foresight activities in diverse areas including triggering response, driving strategic discussion, identifying resources needed to generate long term competitive advantage, and strategic agility (Rohrbeck, 2012; Rohrbeck & Gemünden, 2011; Rohrbeck & Schwarz, 2013; Vecchiato, 2015; Wilburn & Wilburn, 2011).

Studies revealed that future foresight is important for the survival of organizations especially with the emergence of the knowledge economy (Burt & Heijden, 2003; Tsoukas &
Shephard, 2009). Nowadays, organizations are required to balance between their short-term and long-term planning. Researchers concluded that understanding the complex forces that drive changes in their operating environments is vital for their success (Battistella, 2014; Rohrbeck & Schwarz, 2013).

Slaughter (1995) argued that foresight provided insights in four perspectives; consequence assessment, that is assessing the implication of present actions and decisions on the future state for the organization, early detection of problems, proactive strategy for future needs, and future scenario preparations. Such insights will help management to make faster decisions which put their companies on the lead of competition (Rohbreck, Arnold, & Heuer, 2007).

Researchers argued that lack of environmental scanning can lead to major business failures (Lauder, 2013; Mullins, 2010). Lauder (2013) addressed failure of foresight as a major risk in organizations. The intentional action of overlooking warning signals and identification of risk at early stages can lead to disasters such as the Challenger accident (Lauder, 2013). In recent years, catastrophes such as British Petroleum rig explosion which resulted in one of the largest oil spill in history, had elements of failure to foresight such as failing to detect leak soon enough (Mullins, 2010).

Rohbreck (2012) discussed foresight activities’ contribution to enhancing the product portfolio through scanning the environment and consumer scouting, exploring and developing new business fields, and supporting the process of technology acquisition. Rohrbeck & Gemünden (2011) discussed the role of foresight activities in enhancing organizational innovation including providing direction and vision for the innovation activities, triggering innovation initiatives, and challenging innovators for better innovations. Rohrbeck & Schwarz
CORPORATE FUTURE FORESIGHT IN GOVERNMENT

(2013) discussed that key benefits of future foresight activities were realized in enhancing organizational learning and determining the initiatives that help in shaping the future.

Vecchiato (2015) focused on highlighting strategic foresight’s role in enhancing the long-term performance of organizations. He addressed three key areas in which future foresight contributes most: reducing environmental uncertainty, enhancing strategic planning and first mover advantages, and supporting organizational learning and organizational memories.

Wilburn and Wilburn (2011) emphasized the role of scenarios used in future foresight in helping the decision maker to formulate toady’s strategic direction based on future insights. Thus, organizations can avoid unknown risk and exploit new opportunities more effectively.

The literature reviewed on value gained from future foresight activities revealed an abundance of qualitative studies to explore main areas of contribution. However, quantitative studies that investigate the relationship between value contribution and other variables in future foresight ecosystem are limited. Therefore, this study contributes the body of knowledge in this area.

**Methods and Evaluation**

**Approach**

This research adopts a quantitative approach to test the research hypotheses:

H1: The corporate future foresight maturity level is positively related to the value contribution of foresight activities

H2: the environmental hostility level is related to the value contribution of foresight activities
This approach will be suitable for this type of research as the quantitative method is widely used to test the relationship among variables and reveal underlying trends among them (Creswell, 2014; O’Gorman & MacIntosh, 2015). Additionally, it uses instruments that are carefully designed to reduce bias unlike the qualitative approach which uses various tools for data collection and depends on reflectivity and interpretation of findings, thus, being more bias-prone (Creswell, 2014).

A cross-sectional survey was used as the strategy of inquiry. This method helped in the generalization of results based on the sample tested and enabled inferences about the population (Creswell, 2014; O’Gorman & MacIntosh, 2015). Also, this method is cost effective; especially with online surveys, the cost is relatively inexpensive and comes with the additional benefit of providing more convenient means to track and enhance response rate such as reminders (Denscombe, 2014). Additionally, surveys can be used to collect extensive data about the attributes of the sample and help in drawing conclusions about the population in a relatively short time span (Creswell, 2014). A major advantage of using a survey is its flexibility nature as it can be administrated via different means, i.e. mobile surveys, online surveys or phone survey (Denscombe, 2014). The researcher can choose the medium that is more convenient for the research sample. Moreover, the anonymity of the survey would increase the honesty and openness in the answers which might not be attained by other research methods (Denscombe, 2014). On the other hand, quantitative method can limit the outcomes of the research as the participants have limited options to choose from. Also, the quantitative research isolates the participants from their natural setting and does not accommodate for the differences among them, thus limits generalizations of results (Denscombe, 2014). The effect of these drawbacks is addressed in the study limitation section on p. 42.
Population, Sample and Participants

The population of this survey study is Dubai’s local authorities who provide services to citizens, businesses or other government entities and adopt future foresight activities among their functions. After the UAE’s government release of the future strategy in 2015 and mandate of its execution to all government entities in the country (mocaf.gov.ae, n.d), more future foresight activities have been conducted in these entities.

A total of 42 entities who provide services operate under the local government of Dubai (dubai.ae, n.d). Although they vary in size and role in serving the needs of UAE’s citizens and residents, all follow the Dubai Plan 2021 which describes the future of Dubai through holistic and complementary perspectives including people, society, experience, place, economy and government (Dubaiplan.ae, n.d). Therefore, they share the same goal of achieving the Dubai vision 2021.

The means of access to the population included their mailing lists, phone numbers and face to face contact via the Dubai Government Achievement Exhibition (DGAE). DGAE is an annual exhibition where all local authorities, institutions, departments and agencies showcase their most effective programmers and innovative solutions (DGEA.ae, 2017). Therefore, this exhibition provided a great opportunity for the researcher to meet the individuals who participated in the study.

The sample size was determined using the confidence level of 95% and the confidence interval of +/- 5 which resulted in 38 participants (Pyrczak, 2010). Denscombe (2014) proposed tactics to ensure high response rate and achieving the determined sample including sending the
survey to a larger number of participants given the predicted response rate and following up with participants.

The participants are the strategy, excellence and institutional development unit’s directors and experts. They are who the researcher assumes to have the required knowledge about the subject of the study as they are engaged in the activities of future foresight as per the management of future foresight activities mandate (mocaf.gov.ae).

The researcher followed a single stage sampling design for this study. Single stage sampling design is the preferred procedure if the researcher had access to the participants directly (Creswell, 2014). The researcher used a random sample as a selection process for individuals who participated in the study. This means that each individual in the population had an equal opportunity of being selected (Creswell, 2014). The random sample was generated using Excel. The procedure involves assigning a random number to each participant, sorting the numbers in ascending order and then selecting the number of rows that represents the sample size (uwec.edu, n.d). The researcher used a non-stratified sample for this study. Stratification is when specific characteristics of the individual needed to be known first before being selected (Creswell, 2014). For this study, no specific characteristics were needed.

**Instrument**

The survey instrument used for this study is based on the revised corporate foresight questionnaire developed by Rene Rohbreck. Rohbreck first used the corporate foresight questionnaire in a qualitative research to establish and validate the MMCF (Rohbreck, 2011). After that Rohbreck, Jissink, & Huizingh (2015) used a revised version in a quantitative study
aimed at developing and validating a measurement scale for corporate foresight and examining its impact on performance in private sector companies.

For this study, the researcher used the revised corporate foresight questionnaire as the data collection instrument (see Appendix A). The researcher was granted permission via email to freely use the scales developed by the author. However, as the questionnaire was designed for measurement in the private sector, the researcher had to slightly modify some of its parts to make it more applicable for measurement in government sector. The questionnaire consists of four parts: general information, context, corporate foresight, and value contribution. The general information part was altered by replacing industry and revenue questions with a question about entity service type which is more aligned with a government mandate, the organization size question remained the same as it suitable for both purposes. The context and corporate foresight questions remained the same. The value contribution part had questions about new product success, new product innovativeness, and financial performance including market share, sales, return on investment, and profitability. These questions were replaced by questions about introducing new services and products, exploiting new opportunities, and avoiding unknown risks. More explanation about the basis of these modifications is provided in the dependent variable measurement sub-section.

**Independent variables measurement.** The first independent variable, the future foresight maturity level, is measured using the corporate foresight part of the questionnaire. It consists of five main areas: information usage, method sophistication, people and networks, organization, and culture. The second independent variable, the environmental hostility level, is measured using the context part of the questionnaire. It consists of three main parts: competitive intensity, technological turbulence, and market turbulence. This structure is based on the MMCF
which the researcher believes it would adequately measure the independent variables. That is, for the future foresight maturity level, maturity models make it possible to measure the company’s level of proficiency and suggest steps for improvement (Downing, 2013). Thus, this model serves the purpose of the research and provides a framework to test the research first hypothesis. For the environmental hostility level, literature review showed that market and technological turbulences may lead to creating new service or products without the effort to detect them (Han, Kim, & Srivastava, 1998). Also, it revealed that competitive intensity may reveal unknown risks or the need to develop new opportunities (Auh, & Menguc, 2005). Therefore, the second hypothesis can be adequately tested using this structure.

**Dependent variable measurement.** In order to measure the dependent variable, the value contribution of foresight activities in government entities, the researcher amended the corporate foresight questionnaire questions based on the findings revealed from literature review as follows:

- **Question 4.1** “Our organization exploited new opportunities over the past two years” asks about the first pillar of value contribution, exploiting new opportunity, was derived based on the literature review findings of that many companies showed contributed value of future foresight in ways outside the expectation scope (Rohbreck, 2012), and that corporate foresight enhanced organization’s ability to explore new business fields (Rohrbeck & Gemünden, 2011)

- **Question 4.2** “Future foresight helps our organization avoid unknown risks” asks about the second pillar of value contribution, avoiding unknown risk, was derived based on the literature review findings of that “using scenarios allows organizations to make strategic decisions with foresight into what that uncertainty could look like in the future” (Wilburn
& Wilburn, 2011, p. 164), corporate foresight enhanced organizational ability in recognizing and coping with uncertainty (Vecchiato, 2015), and that foresight activities enhanced organizational capacity to interpret and respond to change (Rohbreck & Schwarz, 2013).

- Question 4.3 “Our organization introduced new services/products to its customers over the past two years” addresses the third pillar of value contribution, introducing new services and products, based on the finding that corporate foresight role in initiating novel concepts and ideas. Thus, increasing quantity and quality of innovation output (Rohrbeck & Gemünden, 2011).

Thus, the researcher believes that exploiting new opportunities, avoiding unknown risks and introducing new products and services can adequately measure the value contribution of future foresight activities.

**Instrument’s validity.** Validity in quantitative research is crucial to be able to draw meaningful conclusions from the data resulted from the instrument and show the strength of interpretations (Creswell, 2014). Content validity shows whether the items measure the intended content and construct validity shows whether the items measure the hypothetical constructs or concepts (Creswell, 2014).

Creswell and Denscombe emphasized the importance of clarity of purpose, confidentiality, freedom to respond and gratitude to respondents for a well-perceived survey instrument (Creswell, 2014; Denscombe, 2014). Therefore, the researcher added an introduction to the questionnaire to ensure the before mentioned points are covered and increase its face and content validity.
Furthermore, it is important to ensure there are no barriers exist due to language proficiency (Denscombe, 2014). Therefore, the questionnaire was bilingual: Arabic and English. The original questionnaire was in English and the researcher of this study added the Arabic translation to accompany each question for better understanding. Additionally, the researcher selected a convenient sample of 3 experts in future foresight and studies to review the questionnaire itself to ensure its clarity, face and content validity. Their feedback and comments where incorporated in the final instrument revision. Additionally, they also assessed the translation and the final version was translated back to English and the results showed no significant difference.

For using an existing instrument, Creswell (2014) encouraged reporting the original authors’ efforts in ensuring validity. Rohbreck et al. (2015) conducted a pilot test to assess face and content validity where they selected a convenient sample of six participants in academic and industry positions with knowledge and experience in foresight practices and amended the survey items according to their feedback. As explained in the previous paragraph, and in the dependent variable measurement subsection, the researcher ensured that validity holds despite the minor modifications made to questionnaire by involving experts in content review, providing clarity in the response process, and building on literature research and previously developed outcome measures for the changes made.

**Instrument reliability.** Reliability refers to the consistency of the measurement or the degree to which an instrument measures the same way each time it is used under the same conditions with the same subject (Creswell, 2014).

For the revised corporate foresight questionnaire, the authors used factor loadings to reflect construct reliability, and reported an adequate loading ranging from 0.57 to 0.88
They also assessed internal consistency reliability using composite reliability (CR) scores and reported values ranging from 0.79 to 0.92 which exceeds the minimum required 0.7 (Rohbreck et al., 2015).

Moreover, the reliability of this study’s instruments was checked using Cronbach's alpha which is a measure of internal consistency. Cronbach alpha calculates correlation among all the variables, in every combination. The reliability test using Cronbach's Alpha showed that the alpha coefficient for the 30 items in the survey is 0.927, suggesting that the items have relatively high internal consistency. A reliability coefficient of .70 or higher is considered acceptable in most social science research situations (Institute for Digital Research and Education, n.d). Additionally, the same test was run for the modified part of value contribution and the result was 0.723 which is also acceptable.

Data Collection

Data was collected by means of an online questionnaire over a two week period. As the population is limited and relatively small, the survey was sent out to all entities to ensure sufficient responses were attained and follow up was conducted on non-responses. Out of 42 questionnaires sent, 39 responds were received with a response rate of 93%.

The researcher used Qualtrics as tool to design the survey. Qualtrics is an enterprise research platform that enables users to design, administer, track and analyze surveys (Qualtrics.com, n.d). It is also recognized as the world’s leading online survey and insight platform, and it is used for collecting data for academic research among hundreds of universities and academic institutions (www.rit.edu/survey, n.d). Additionally, it is Rochester Institute of Technology’s online survey tool; therefore it was available at no cost. Additionally, Qualtrics provide various means to distribute the questionnaire once it is designed. Anonymous link and
personalized links are among the available options for distribution (Qualitrics.com, n.d). The researcher used both means to reach the research sample size. Anonymous link usage, where the respondent’s personal information is not registered, increased the sense of freedom to participate. However, the researcher asked participants to confirm their completion of the survey via email for data collection tracking. The personalized links had a built-in mechanism to track response status.

The researcher used several tactics to reduce bias including stressing the importance of the study and making it easy for respondents to participate (Pyrczak, 2010). The importance of the study was emphasized in the questionnaire introduction and the official academic support letter issued from RIT. The questionnaire was designed to be easily accessed and completed by the respondent through their emails or mobile phones. Also, the questionnaire was set to resume from where the respondent left, show progress, and thank the respondent for a smooth participation experience. Preventing taking the survey again ensured that only the intended respondents answer the questionnaire. Also, personalized links were used to follow up on non-responses as this option enabled tracking the progress of survey completion.

To reduce non-respondents’ bias, the researcher chose to meet participants who did not respond, known by comparing the number of responses and number of completion confirmation emails received, face to face at the DGAE where they were asked to participate in the study using a tablet provided by the researcher. This method had advantages including speeding the data collection process, increased response rate, and providing answers to the respondent’s questions and clarification (Denscombe, 2014). Disadvantages of this approach include discomfort in answering the survey as the researcher is present in the same setting. However, the researcher managed to give respondent the privacy needed to answer the survey freely as no data
about the respondent’s or his entity’s identity was collected throughout the questionnaire (Denscombe, 2014). As a result, the response rate was high (93%) and the non-respondent’s results would have not substantially changed the overall results (Creswell, 2014).

**Data Analysis**

Descriptive statistical analysis was used to summarize the data. That included frequencies and percentages that best describes the research findings (Creswell, 2014). Correlational and inferential statistics were used to test the research hypothesis, and check for reliability.

Analyzing the basic information including the entity size and entity service type using frequencies and percentages helped the researcher in understanding the sample characteristics and prepared to test for certain trends among certain population segments.

The first independent variable, the maturity level of future foresight, was measured by analyzing the results of part three in the questionnaire, corporate foresight, which is designed to capture the most salient elements of corporate foresight ability measured using the five elements of the MMCF: information usage, method sophistication, people and network, organization, and culture (Rohbrech, 2011). The percentage of participants who respond totally agree, agree, disagree, totally disagree was reported and compared to the levels of maturity explained by the MMCF. That is, percentage of responses as totally disagree on questions 3.1-3.5 was considered as level 4 *rudimentary*, disagree as level 3 *better* practice, agree as level 2 *good* practice, and totally agree as level 1 *best* practice (Rohbreck, 2011). The overall level of maturity was calculated as the lowest level of maturity among the five constructs of the MMCF as per the theory of constraints (www.referenceforbusiness.com, n.d).
The second independent variable, the environmental hostility level, was measured using the context part of the questionnaire (questions 2.1, 2.2, and 2.3). Percentages and frequencies were used in analyzing the questions in this part. The percentage of participants who totally agree and agree with the statements was interpreted as the level of environmental hostility. This analysis helped the researcher to capture the attitudes towards the need for foresight activities in the context of UAE’s government entities and determine areas where major uncertainties may arise in the future.

The dependent variable, value contribution of foresight activities, was measured through questions 4.1, 4.2, and 4.3. The percentage of participants who totally agree and agree with these statements was interpreted as the value contribution perceptions. The overall value of the variable was calculated as the average score of the responses on questions 4.1, 4.2 and 4.3 (Statistical Service Center, 2001).

Pearson’s correlational coefficient was used to test the research hypotheses. That is, the relation between the results of questions 3.1-3.5 and questions 4.1-4.3, and the relation between the results of questions 2.1-2.3 and questions 4.1-4.3. Also, $p$-value was used to determine the significance of the results, t-test was used to determine the level of confidence in which general conclusions can be drawn based of the sample findings, and standard error of the mean was used to determine whether the results can be inferred to the population (Pyrczak, 2010). The data analyses for this study were generated using Qualtrics and SPSS software. Both softwares provided robust mechanism for data analysis and facilitated data representation for the researcher.
Reliability check for internal consistency was conducted using Cronbach’s alpha (Creswell, 2014). It checks how closely related a set of items are as a group (UCLA, n.d). The researcher used SPSS to run the test.

**Results**

The population of this study is 42 government entities (N=42), the questionnaire was distributed to 42 entities and 39 entities responded. The response rate is 93%. Sample size is 39 (n=39).

The data collected showed the demographics of the sample as \( f=21 \) (54%) of the participants were medium size entities, \( f=10 \) (26%) were large size, and \( f=8 \) (21%) were small size ones. It also showed that 71% of participants provides services to customers (G2C), 58% provides services to businesses (G2B), and 45% provides services to government (G2G) keeping in mind that an entity can be providing one or more of these service types.

The context of future foresight questions (questions 2.1, 2.2, 2.3) were designed to measure the level of environment hostility. The results showed a moderate level of environment hostility with 5% agree and 62% strongly agree that their environment is hostile.

For competitive intensity, the results showed low level of competitive intensity with only 3% strongly agree and 8% agree that they are experiencing rivalry competition. In details, 3% strongly agree and 10% agree that it is very difficult to differentiate their brand in terms of products or services due to similarities in the offerings to the market. Also, 3% strongly agree and 39% agree that, anything one competitor can offer, others can match easily.

Technology turbulence results showed high level of turbulence with 56% strongly agree and 36% agree. Particularly, 69% strongly agree and 26% agree that technological changes
provide big opportunities. Also 44% strongly agree and 44% agree that the technology in the entity’s industry is changing rapidly. Additionally, 54% strongly agree and 39% agree that large number of new product and service ideas have been made possible through technological breakthroughs in the entity’s industry.

Market turbulence results showed that 21% strongly agree and 64% agree that the extent of turbulence in the market is high. Also 28% strongly agree and 56% agree that the frequency of changes in customer preferences is high. This indicates high market turbulence in the environment in which the entities operate.

Future foresight maturity level (FFML) results showed various maturity levels among the government entities. The majority of entities were at better practice maturity level $f=22$ (56%). Table 1 shows the frequency and percentage of each level.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFML Level 4</td>
<td>2</td>
<td>5.1</td>
<td>5.1</td>
</tr>
<tr>
<td>Best practice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3</td>
<td>12</td>
<td>30.8</td>
<td>35.9</td>
</tr>
<tr>
<td>Good practice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2</td>
<td>22</td>
<td>56.4</td>
<td>92.3</td>
</tr>
<tr>
<td>Better practice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1</td>
<td>3</td>
<td>7.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Rudimentary</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Additional cross tabulation analysis of FFML results with entity size disclosed that the 5% of entities who reached best practice level of FFML were all medium size entities. Table 2 below shows the detailed results.

Table 2

<table>
<thead>
<tr>
<th>Entity size</th>
<th>Level 4</th>
<th>Level 3</th>
<th>Level 2</th>
<th>Level 1</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Best practice</td>
<td>Good practice</td>
<td>Better practice</td>
<td>Rudimentary</td>
<td></td>
</tr>
<tr>
<td>Large</td>
<td>0.0%</td>
<td>17.9%</td>
<td>5.1%</td>
<td>2.6%</td>
<td>25.6%</td>
</tr>
<tr>
<td>Medium</td>
<td>5.1%</td>
<td>10.3%</td>
<td>35.9%</td>
<td>2.6%</td>
<td>53.8%</td>
</tr>
<tr>
<td>Small</td>
<td>0.0%</td>
<td>2.6%</td>
<td>15.4%</td>
<td>2.6%</td>
<td>20.5%</td>
</tr>
<tr>
<td>Grand Total</td>
<td>5.1%</td>
<td>30.8%</td>
<td>56.4%</td>
<td>7.7%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The results also showed a relatively similar distribution among the five elements of the MMCF. Table 3 below shows the results.

Table 3

<table>
<thead>
<tr>
<th>Information Usage</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Level 4</td>
<td>12</td>
<td>30.8</td>
<td>30.8</td>
<td>30.8</td>
</tr>
<tr>
<td>Best practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3 Good practice</td>
<td>16</td>
<td>41.0</td>
<td>41.0</td>
<td>71.8</td>
</tr>
<tr>
<td>Level 2 Better practice</td>
<td>9</td>
<td>23.1</td>
<td>23.1</td>
<td>94.9</td>
</tr>
<tr>
<td>Level 1 Rudimentary</td>
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<td>5.1</td>
<td>5.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
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<td>100.0</td>
<td>100.0</td>
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<table>
<thead>
<tr>
<th>Method Sophistication</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>Level 4</td>
<td>8</td>
<td>20.5</td>
<td>20.5</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>---</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Best practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3</td>
<td></td>
<td>21</td>
<td>53.8</td>
<td>53.8</td>
</tr>
<tr>
<td>Good practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2</td>
<td></td>
<td>10</td>
<td>25.6</td>
<td>25.6</td>
</tr>
<tr>
<td>Better practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>39</td>
<td>100.0</td>
<td>100.0</td>
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</table>

**People and Network**

<table>
<thead>
<tr>
<th>Valid</th>
<th>Level 4</th>
<th>5</th>
<th>12.8</th>
<th>12.8</th>
<th>12.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3</td>
<td></td>
<td>22</td>
<td>56.4</td>
<td>56.4</td>
<td>69.2</td>
</tr>
<tr>
<td>Good practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2</td>
<td></td>
<td>11</td>
<td>28.2</td>
<td>28.2</td>
<td>97.4</td>
</tr>
<tr>
<td>Better practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1</td>
<td></td>
<td>1</td>
<td>2.6</td>
<td>2.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Rudimentary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>39</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Organization**

<table>
<thead>
<tr>
<th>Valid</th>
<th>Level 4</th>
<th>7</th>
<th>17.9</th>
<th>17.9</th>
<th>17.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3</td>
<td></td>
<td>21</td>
<td>53.8</td>
<td>53.8</td>
<td>71.8</td>
</tr>
<tr>
<td>Good practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2</td>
<td></td>
<td>11</td>
<td>28.2</td>
<td>28.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Better practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>39</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Culture**

<table>
<thead>
<tr>
<th>Valid</th>
<th>Level 4</th>
<th>6</th>
<th>15.4</th>
<th>15.4</th>
<th>15.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3</td>
<td></td>
<td>19</td>
<td>48.7</td>
<td>48.7</td>
<td>64.1</td>
</tr>
<tr>
<td>Good practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2</td>
<td></td>
<td>13</td>
<td>33.3</td>
<td>33.3</td>
<td>97.4</td>
</tr>
<tr>
<td>Better practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1</td>
<td></td>
<td>1</td>
<td>2.6</td>
<td>2.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Rudimentary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The value contribution results showed that there was a high value contribution of foresight activities as depicted in the percentages of responses (totally agree and agree) cumulatively coming to 89.7%. *Figure 2* shows the results.

*Figure 2. Value contribution of foresight activities responses percentage*

The results also showed that 44% of respondents strongly agree and 46% agree that their organizations exploited new opportunities over the past two years. Meanwhile, 28% strongly agree and 49% agree that their organizations avoided risk and anticipated unknown risks over the past two years. Also, 54% strongly agree and 36% agree that their organizations introduced new services/products to its customers over the past two years. This indicates that the perceived value contribution is higher in identifying opportunities followed by introducing new services and the least value was perceived in enhancing risk management.
Hypothesis Testing

The correlation analysis used to test the first hypothesis showed a significant positive relationship between the future foresight maturity model and the value contribution of foresight activities $p=0.035$ ($p<0.05$). The strength of the relationship is reflected by the value of Pearson’s coefficient $r=0.338$. This implies that the higher the maturity level of future foresight, the higher the value gained from future related activities. Table 4 shows the details.

<table>
<thead>
<tr>
<th>FFML</th>
<th>Pearson Correlation</th>
<th>Value Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>39</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).

The correlation analysis used to test the second hypothesis showed no significant relationship between the environment hostility level and the value contribution of foresight activities because the p-value is greater than the significance level 0.05 ($p=0.788$). Table 5 shows the details.

<table>
<thead>
<tr>
<th>Environmental Hostility level</th>
<th>Pearson Correlation</th>
<th>Value Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.788</td>
</tr>
</tbody>
</table>
Inferential analysis using $t$-test determines whether the sample mean is statistically different from the population mean (Kent State University, n.d). The result of $t$-test showed significance ($p<.001$). This indicates that the results of the sample can be inferred to the population. Table 6 shows the details for H1 and Table 7 shows the details for H2

<table>
<thead>
<tr>
<th>Table 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t$-test Results for H1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>One-Sample Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
</tr>
<tr>
<td>FFML</td>
</tr>
<tr>
<td>Value Contribution</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>One-Sample Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Value = 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>t</strong></th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFML</td>
<td>23.761</td>
<td>38</td>
<td>.000</td>
<td>2.667</td>
<td>2.44</td>
</tr>
<tr>
<td>Value Contribution</td>
<td>17.311</td>
<td>38</td>
<td>.000</td>
<td>1.778</td>
<td>1.57</td>
</tr>
</tbody>
</table>
### Table 7

#### t-test Results for H2

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Hostility level</td>
<td>39</td>
<td>2.31</td>
<td>.614</td>
<td>.098</td>
</tr>
<tr>
<td>Value Contribution</td>
<td>39</td>
<td>1.78</td>
<td>.641</td>
<td>.103</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Hostility level</td>
<td>23.486</td>
<td>38</td>
<td>.000</td>
<td>2.308</td>
<td>2.11 to 2.51</td>
</tr>
<tr>
<td>Value Contribution</td>
<td>17.311</td>
<td>38</td>
<td>.000</td>
<td>1.778</td>
<td>1.57 to 1.99</td>
</tr>
</tbody>
</table>

### Discussion

In this study, the researcher aimed to verify whether the level of future foresight maturity level is positively related to the value contribution of foresight activities, and whether environmental hostility level is related to the value contribution of foresight activities in a governmental context. The results supported the first hypothesis and disproved the second one.

For H1, the results showed a significant positive relationship between government entities’ future foresight maturity level and the value contribution of foresight activities. Evidences that support these findings are needed to showcase that public sector and
governmental institutions can benefit from implementing strategies that support fostering internal capabilities for long-term planning and future thinking. That is, more research based evidences are needed to shift the perception that the major benefits of future foresight for government entities are intangible such as decision-making aid and risk management (Everest-Phillips, 2015) to creating new products and service and enhancing future agility.

What was surprising in the overall maturity level of future foresight results is that although most organizations scored a good practice level at 3 out of 5 constructs, the overall maturity level remained at better practice level. This finding can be explained by the theory of constraints (TOC) where the strength of any system is determined by its weakest link (www.referenceforbusiness.com, n.d). This implies that interdependencies exist among the MMCF elements and thus organizations should consider them for long-term planning.

The results showed that the majority of government entities realized greater values from foresight activities in introducing new services and products to its customers, exploiting new opportunities and avoiding risk and anticipating unknown risks respectively. The relation between the corporate foresight maturity level and the ability to introduce new products and services is supported by the literature. A study showed that corporate foresight is positively related to performance including new product success, new product innovativeness and financial performance (Rohbreck, Jissink, & Huizingh, 2015). Another study provided evidence that corporate foresight contributes to the organizational ability to innovate (Paliokaitė & Pačėsa, 2015). While these studies had taken place in the private sector context, the results of the two studies and this study indicate a similar nature of relationship among the variables. Also, the
literature supported the finding that corporate foresight is related to the entity’s ability to seize new opportunities and managing unknown risks (Abell, 1999; Vecchiato, 2015).

For H2, the results showed no significant relationship between the environmental hostility level and the value contribution of foresight activities. This implies that external factors including competitive intensity, technological turbulence and market turbulence have inconclusive evidence of association with the organizational ability to introduce new products and services, exploit new opportunities and avoid unknown risks. In the literature, the environmental hostility level three constructs were used as control variables in a causal study and showed no correlation to value contribution of foresight activities (Rohrbeck, Jissink, & Huizingh, 2015). An alternative explanation to the findings may include that environmental hostility may create the sense of urgency to react or anticipate change and future trends. However, organizations can not translate it into action unless they build their internal capabilities to enable decision making under conditions of uncertainty. Thus, they can start to realize the benefits of detecting change and accumulating knowledge about possible futures.

**Contribution to Literature**

This research contributes to the future foresight literature in several ways. It extends Rohbreck’s previous research of the foresight maturity model and structural elements of future foresight through implementing an existing instrument in a new context. That is, this research provided a chance to test the MMCF measurement scale on government entities as previous usage was focused on private organizations (Rohbreck, 2011). Moreover, having the instrument tested in a government context sets the path for additional theory testing in this sector.
It also helps significantly in bridging the gap in the literature when it comes to future foresight and value contribution of foresight activates in the public sector. In contrast, future foresight value contribution in the private sector has been supported by several studies (Peter & Jarratt, 2015; Rohrbeck & Gemünden, 2011; Sarpong & Maclean, 2016; Rohrbeck & Schwarz, 2013). Additionally, results showing a positive impact on all elements of value contribution enhance the notion among scholars of what foresight is about in terms of detecting invisible trends and articulating them to create novel opportunities (Tsoukas and Shephard, 2009). It also reinforces the scholars’ directions towards viewing future foresight as a system rather than a process (Battistella, 2014; Dufva & AHlqvist, 2015; Peter & Jarratt, 2015). This is evident by the significant relation between the elements of the MMCF and the value contribution of foresight activities.

This research contributes to the literature of management in governmental context. The results revealed that the level of environmental hostility around government’s entities is moderate despite the low level of competition in terms of service offerings. Moreover, the results showed that other factors play a major role in creating the necessity for adopting future foresight methodologies within the government operating model including high technological turbulence and high market turbulence. These findings support the literature that showed the understanding the complex forces and drivers in the contextual environment of government organizations is important for their survival and success (Kutz, 2011; Tully, 2015). It also supports the trend towards management practices that seek knowledge in areas further than the transactional environment of their organizations to survive and thrive in times of sudden change and go beyond the pressure towards short-term issues (Dreyer & Stang, 2013; Kutz, 2011).
**Practical Contribution**

The results of this study help in integrating future foresight in the public sector. Using the MMCF to measure the future foresight maturity level in government entities helps in viewing future foresight as a system rather than a process, which is important to institutionalize the concept in all work aspects (Battistella, 2014; Dufva & AHlqvist, 2015; Peter & Jarratt, 2015).

Government organizations can look at the constructs of the MMCF and determine key strengths and weaknesses whereby they can start the improvement cycle (Downing, 2013). The results showed that information usage and culture constructs are weaker points, majority at better practice level, compared to method sophistication, organization and people and network where majority of entities scored a good practice level. So, focus is given to understanding the underlying behaviors and systems related to the weaker elements for a faster improvement cycle.

This research helps in determining priorities in building a future oriented government in UAE. The results indicated that efforts should be directed towards enhancing future related information usage such as environmental scanning within and outside current business, proactive scanning in short and long term and expanding sources variety and exclusivity. Similarly, a focus on the culture construct’s elements including the ability to receive signals from the external environment, challenging basic assumptions and encouraging detecting and transmitting weak signals would enhance overall future foresight maturity level and hence, foresight value contribution.

**Study Limitations**

A cross-sectional survey study is a widely used method of data collection in business and management research and it suited to the purpose of this research and its timeframe. However, it
represents the results at a specific point of time. Given the fact that the benefits of foresight may be realized over an extended period of time, the participants’ response may be limited by their knowledge about these benefits at the time of the study.

Also, the results are heavily dependent on the design of the instrument, and the sample selection and administration (Creswell, 2014). Although the instrument used in this study showed high internal consistency and validity, it is the first time used in this context. In addition, modifications have been made to cater for its governmental context. Therefore, the results may be limited to this specific context and cannot be generalized to other government entities in other countries.

Considering the fact that future foresight still in its infancy in the Middle East region, the selected sample might lack experience or knowledge to answer the questions properly. Participants’ level of exposure to foresight practices in their organizations as well as their effect in the organization varies among the entities. It is also influenced by the organizational structure, information exchange policy and knowledge sharing culture. Such limitations may be the foundation for further research in this area.

**Recommendations for Further Research**

Further future foresight research can be built on the results of this study. A longitudinal study could be performed using this research instrument. It would help in supporting literature in this area and provide more evidences on the value of future foresight activities, considering its time sensitivity, in seizing new opportunities and unraveling unknown risks. It would also enhance the general awareness towards the notion of future foresight among the government sector.
The circumstances that UAE’s government operates in and the drivers that would influence the traditional civil service provision methods could be further researched to discover the megatrends that any government should consider in their long-term planning process.

The constructs of MMCF could be also further researched using a qualitative approach to explore the specific ways they might affect the corporate foresight maturity level and how they reflect them in their everyday practice. Information usage, method sophistication, organization, people and network, and culture are rich constructs that further research may reveal key differences between their elements among private and public sectors. It may also reveal unarticulated areas which can be utilized for a superior deployment of foresight framework in government context.

Other structural elements such as organization size and type of service offered and its relation to the value contribution of foresight activities, and FFML can be also further investigated. Such studies can enrich literature and help in developing guidelines for government entities that helps in realizing the benefits of future foresight more effectively. Ultimately, such studies would enable better government service and policy making.
References


Rohrbeck, R., & Schwarz, J. (2013). The value contribution of strategic foresight: Insights from an empirical study of large European companies. *Technological Forecasting and Social Change, 80*(8), 1593-1606. doi:http://dx.doi.org/10.1016/j.techfore.2013.01.004


impede) organizational foresightfulness. *European Management Journal, 31*(6), 613-625. doi:http://dx.doi.org/10.1016/j.emj.2013.03.004


Appendix

Dear participant,

Welcome to the future talk survey!

This questionnaire is part of research requirements for my master degree thesis with Rochester Institute for Technology and the data provided is only for academic use and will be treated with top confidentiality.

The questionnaire is designed to test the relationship between future foresight maturity level and value contribution of foresight activities in government entities in United Arab Emirates.

Thank you for dedicating 10 minutes of your valuable time to answer the questionnaire freely.

Thank you for participating,

Rochester Institute for Technology

Dubai

عزيزي المشارك,

مرحبا بكم في مسح حديث المستقبل!

هذا الاستبيان هو جزء من متطلبات البحث العلمي لرسالة الماجستير الخاصة بي مع معهد روتشستر للتقنية وهو مخصص للاستخدام الأكاديمي فقط وسيتم التعامل مع البيانات المقدمة بأعلى درجات السرية.

تم تصميم هذا الاستبيان لاختبار العلاقة بين مستوى النضج في استشراف المستقبل والقيمة المحققة من عملية استشراف المستقبل في الجهات الحكومية في دولة الإمارات العربية المتحدة.

شكرًا لمشاركتك،

معهد روتشستر للتكنولوجيا

دبي
Part 1 – General Information

المعلومات العامة

1.1 Entity Name

اسم الجهة

1.2 Entity Size

حجم الجهة

Small (Less than 100 employee) □

Medium (101-5000 employee) □

Large (more than 5000 employee) □

1.3 Entity Service Type

نوع خدمات الجهة

Government to Customer (G2C) □

Government to Business (G2B) □

Government to Government (G2G) □

Part 2 – Context

السياق

For all questions please choose the answer you find more suitable:

في جميع الأسئلة، يرجى اختيار الإجابة التي ترونها مناسبة

<table>
<thead>
<tr>
<th>#</th>
<th>Question</th>
<th>Totally Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Totally Disagree</th>
</tr>
</thead>
</table>

Competitive intensity

حدة المنافسة
There are too many similar products/services in the market, therefore it is very difficult to differentiate our brand.  

There are too many similar products/services in the market, therefore it is very difficult to differentiate our brand.

There are too many similar products/services in the market, therefore it is very difficult to differentiate our brand.

Anythin
g that one competitor can offer, others can match  

Easily  

Easily

Technological turbulence

التغيرات التكنولوجية

Technological changes provide big opportunities in our industry  

التطور التكنولوجي يوفر فرصا كبيرة في مجالنا

Technological changes provide big opportunities in our industry  

التطور التكنولوجي يوفر فرصا كبيرة في مجالنا

Technological changes provide big opportunities in our industry  

التطور التكنولوجي يوفر فرصا كبيرة في مجالنا

The technology in our industry is changing rapidly  

التكنولوجيا في مجال عملنا تتغير بسرعة

The technology in our industry is changing rapidly  

التكنولوجيا في مجال عملنا تتغير بسرعة

The technology in our industry is changing rapidly  

التكنولوجيا في مجال عملنا تتغير بسرعة

large number of new product/service ideas have been made possible through technological breakthroughs in our industry  

نتيجة للتطور التكنولوجي الكبير، أصبح بالإمكان تقديم عدد كبير من الأفكار للخدمات والمنتجات الجديدة

large number of new product/service ideas have been made possible through technological breakthroughs in our industry  

نتيجة للتطور التكنولوجي الكبير، أصبح بالإمكان تقديم عدد كبير من الأفكار للخدمات والمنتجات الجديدة

large number of new product/service ideas have been made possible through technological breakthroughs in our industry  

نتيجة للتطور التكنولوجي الكبير، أصبح بالإمكان تقديم عدد كبير من الأفكار للخدمات والمنتجات الجديدة

Market turbulence

التغيرات في السوق

The extent of turbulence in the market is high  

مدى التقلبات الحاصلة في السوق عالي

The extent of turbulence in the market is high  

مدى التقلبات الحاصلة في السوق عالي

The extent of turbulence in the market is high  

مدى التقلبات الحاصلة في السوق عالي

The frequency of changes in customer preferences is high  

وتيرة التغييرات في تفضيلات المتعاملين عالية

The frequency of changes in customer preferences is high  

وتيرة التغييرات في تفضيلات المتعاملين عالية

The frequency of changes in customer preferences is high  

وتيرة التغييرات في تفضيلات المتعاملين عالية

Part 3 – Corporate Foresight

For all questions please choose the answer you find more suitable:

For all questions please choose the answer you find more suitable:

For all questions please choose the answer you find more suitable:
<table>
<thead>
<tr>
<th>#</th>
<th>Question</th>
<th>Totally Agree موافق بشدة</th>
<th>Agree موافق</th>
<th>Disagree غير موافق</th>
<th>Totally Disagree غير موافق بشدة</th>
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</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Information Usage استخدام المعلومات</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>a</td>
<td>Our organization performs environmental scanning also outside our current business تقوم مؤسستنا باستطلاع التغييرات في البيئة المحيطة بالعمل وكذلك خارج نطاق بيئة عملنا أيضاً</td>
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<tr>
<td>b</td>
<td>Our organization performs environmental scanning proactively in both time horizons, long and short term تقوم مؤسستنا باستطلاع بيئة العمل المحيطة بشكل استباقي على المدى الزمني قصير وطويل الأجل</td>
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<tr>
<td>c</td>
<td>Our organization performs environmental scanning by using a large variety of information sources تقوم مؤسستنا باستطلاع بيئة عمل المحيطة باستخدام مجموعة كبيرة ومتنوعة من مصادر المعلومات</td>
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<tr>
<td>d</td>
<td>Our organization performs environmental scanning by using also restricted or exclusive sources (such as personal contacts and specialized databases) تقوم مؤسستنا أيضاً باستطلاع بيئة العمل المحيطة باستخدام المصادر المغلقة أو الحصرية (مثل الاتصالات الشخصية وقواعد البيانات المتخصصة)</td>
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<tr>
<td>3.2</td>
<td>Method Sophistication تطور المنهج</td>
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<tr>
<td>a</td>
<td>Our organization uses structured ways to integrate future-related market and technology information تقيم مؤسستنا باستخدام أساليب مرتبطة بالمستقبل لتكامل معلومات السوق والتقنية</td>
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<tr>
<td>3.3</td>
<td>People and Network</td>
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<tr>
<td>a</td>
<td>People in our organization that engage in future-related research activities have a broad knowledge reaching beyond their own domain</td>
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<tr>
<td>b</td>
<td>People in our organization that engage in future-related research activities have a strong internal network</td>
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<td>c</td>
<td>People in our organization that engage in future-related research activities have a strong external (outside the organization) network</td>
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### 3.4 Organization

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<tbody>
<tr>
<td>a</td>
<td>In our organization future-related research activities are triggered top-down (e.g. by top management).</td>
</tr>
<tr>
<td>b</td>
<td>In our organization top management strongly supports future-related research</td>
</tr>
<tr>
<td>c</td>
<td>In our organization future-related research is formally implemented</td>
</tr>
<tr>
<td>d</td>
<td>In our organization future-related information is rapidly diffused through formal channels</td>
</tr>
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### 3.5 Culture

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<tbody>
<tr>
<td>a</td>
<td>In our organization most employees are receptive to signals from the external environment (outside the organization).</td>
</tr>
<tr>
<td>b</td>
<td>In our organization basic assumptions are challenged explicitly and frequently.</td>
</tr>
</tbody>
</table>
Part 4 – Value Contribution

For all questions please choose the answer you find more suitable:

القيمة المتحققة

<table>
<thead>
<tr>
<th>#</th>
<th>Question</th>
<th>Totally Agree</th>
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<th>Neutral</th>
<th>Disagree</th>
<th>Totally Disagree</th>
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<tbody>
<tr>
<td>4.1</td>
<td>Our organization exploited new opportunities over the past two years</td>
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<td></td>
<td>استغلت مؤسستنا فرصاً جديدة خلال العامين الماضيين</td>
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<td>4.2</td>
<td>Future foresight helps our organization avoid unknown risks</td>
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<tr>
<td></td>
<td>أصبحت مؤسستنا أفضل في تجنب المخاطر وتفوق غير المعروف منها خلال العامين الماضيين</td>
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<tr>
<td>4.3</td>
<td>Our organization introduced new services/products to its customers over the past two years</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
قدمت مؤسستنا خدمات أو منتجات جديدة للمتعاملين خلال العامين الماضيين.