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The effect of Baldrige performance excellence program on organization's innovation/dynamic capabilities

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THE EFFECT OF BALDRIGE PERFORMANCE EXCELLENCE PROGRAM ON ORGANIZATION'S INNOVATION/DYNAMIC CAPABILITIES

by

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ABSTRACT

This dissertation investigated the effect of Baldrige performance excellence program on organization's innovation/dynamic capabilities improvement. According to the literature, there is little or no practical method for building dynamic/innovation capabilities within organizations. The study hypothesizes that Baldrige performance excellence program helps organizations to systematically develop the required dynamic/innovation capabilities for innovation.

Twenty-four organizations that had implemented Baldrige program over the past five years participated in this research study. Two types of data were measured/collected from these organizations; Performance excellence data and Innovation capabilities data. To avoid bias in the data collection, the two data were measured and collected at different time frames and using different tools and methods. The analysis confirmed positive correlation between Organizations' performance excellence improvement through Baldrige program and Innovation capabilities represented in the Six Building Blocks Innovation model used in this research study.

The performance excellence data of the organizations were measured using three different assessment programs from Florida Sterling Council, the state approved version of the US National Malcolm Baldrige Quality Award Program. The three different assessment programs were designed to help organizations in various stages of their performance excellence journey. Challenge program; designed for new organizations that have no experience with Baldrige criteria and typically have low performance, requires a written application and a team of five experienced examiners to visit the organization and conduct thorough interviews with the all the employees. Governor Sterling Award (GSA) program; designed for more experienced

organizations that want to further improve their performance using intensive assessment criteria, requires a written application and a team of eight experienced examiners to visit the organization and conduct intensive interviews with most of the the employees. And Governor Sustained program; designed for mature organizations that completed the GSA assessment in the past three years and want to continue sustain their performance, requires a written application and a team of three experienced examiners to visit the organization and conduct a thorough meetings and interviews with management level employees.

ANOVA statistical tool was used to analyze the difference in performance among the organizations that participated in at least one of the three assessment programs. The result showed a statistical difference with challenge program being the control group. This confirms that organizations' can systematically improve their performance when implementing Baldrige performance excellence program.

The innovation capabilities data of the participated organizations were measured/collected using a survey-based tool. The innovation capabilities survey covers six building blocks; Innovation Value, Innovation Behavior, Innovation Climate, Innovation Resources, Innovation Process, Innovation Success measures. The Overall innovation capabilities measured based on the average score of all the six innovation building blocks.

ANOVA statistical tool was used to analyze the innovation capabilities of organizations from the three assessment programs. The result confirmed a statistical difference with challenge program being the control group.

Regression analysis was also used to analyze the relationship between performance excellence and each of the six innovation building blocks.

The outcome of the study shows a positive correlation between the implementation of Baldrige performance excellence and organizations' innovation capabilities. Which confirms that Baldrige performance excellence program can be used by organizations to systematically build the required dynamic/innovation capabilities for innovations.

I would like to dedicated this to those special people in my life

My parents,

Who provided me with all the love, wisdom, compassion and blessing. The ones who always pray for me and support me all the time. I pray to Allah to extend your life, keep you healthy and help me give back part of what you provided me.

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CHAPTER ONE: INTRODUCTION

During the 80s and 90s, competitive advantage was mainly based on mainstream activities such as efficiency, quality, customer service and speed. However, in today's emerging knowledge economy and global competitions, Innovation became the main competitive advantage and the indispensable resource for organizations to stay alive in today's fast changing global market.

It is not enough for an organization to rely on its past experience or current financial status to sustain its business in the future, threat of substitution due to advancement in technologies, innovation in products or introduction of new business models are out there all the time. It is becoming harder for organization to survive today's market competition without continuous innovation. Thus, Innovation is the lifeblood for every living organization and it must be in the center of every high performing organization.

In order to innovate, an organization must have innovation capabilities. Scholars call them dynamic capabilities, which are the ability to build, integrate, and manage internal and external resources to adopt or develop new ideas and convert them into innovative outcome. Such dynamic capabilities are not easy to develop and maintain in an organization, they require a holistic change to the organization culture, learning, processes, and strategies, and they also require time, leadership, and perseverance.

Baldrige Performance excellence program provides none prescriptive solution and guidance for senior management to assess current performance and institute a continuous improvement system throughout the organization, which makes Baldrige an ideal framework for

organization to use in order to develop the required innovation capabilities. In this research, I will study the effect of Baldrige performance excellence program on organization innovation/dynamic capabilities, through analyzing three different performance excellence assessment programs at Florida Sterling.

Florida Sterling Council is the approved Florida version of the US National Malcolm Baldrige Quality Award Program. Florida Sterling offers seven management assessment programs to help organizations in Florida improve their performance excellence. Three of the different assessment programs are award level programs that require a written application by the organizations and experienced external examiners. These three programs are: Sterling Challenge Award, Governor Sterling Award (GSA), and Governor Sterling Sustained Award.

This research study will utilize Baldrige framework to measure the performance excellence of a twenty-four organizations, each participating in one of the three Sterling award assessment programs. The study will also measure the innovation capabilities of these organizations that completed one of Florida Sterling performance excellence programs using a survey-based tool. The data collected from both measurements of performance excellence and innovation capabilities are completely independent from each other, as each measurement will be conducted through a different mean and during a separate timing frame.

Research question and objective

This dissertation study is focusing on measuring the effect of Baldrige performance excellence program on organizations' innovation capabilities. Figure 1 shows the conceptual framework of this study.

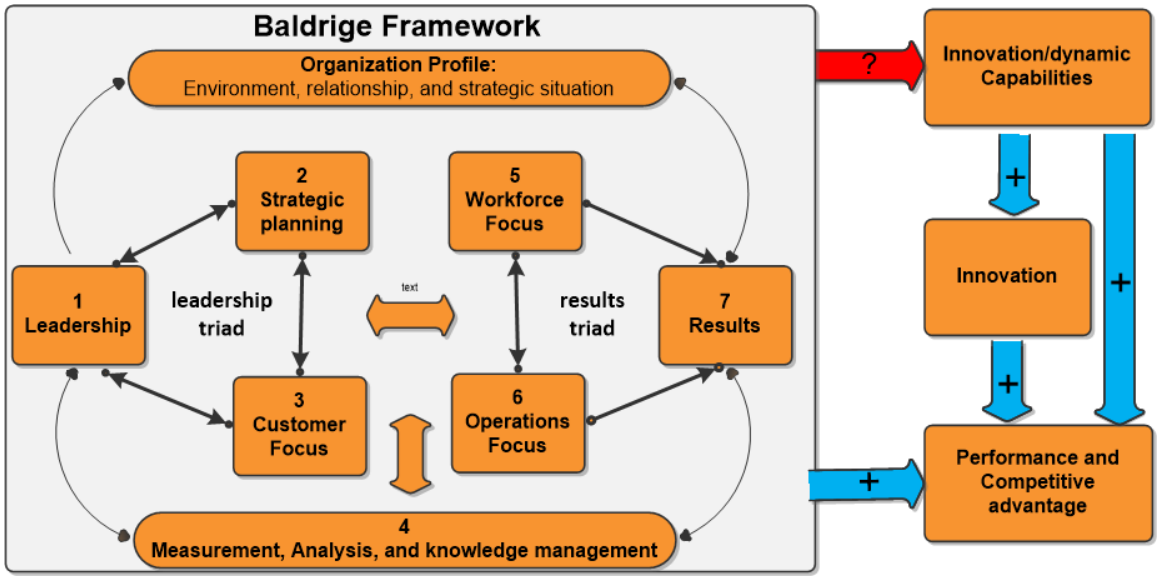

Figure 1: Conceptual framework for the study

This research will answer the following question and hypothesis to explain the relationship between Baldrige assessment framework and innovation/dynamic capabilities.

Main question: What is the effect of Baldrige (Sterling) assessment framework on Organization's innovation/dynamic capabilities?

Main Hypothesis: Baldrige assessment framework has a positive impact on Organization's innovation/dynamic capabilities.

To answer the research main question, further sub-questions and hypothesises have been developed, each sub-question addresses one of six areas that represent a foundation block for organization's innovation capabilities (figure 2.0).

Sub-question 1: What is the effect of Baldrige assessment framework on Organization's value for innovation?

Hypothesis, H1: Baldrige assessment framework has a positive impact on Organization's value for innovation.

Sub-question 2: What is the effect of Baldrige assessment framework on Organization's behaviour regarding innovation?

Hypothesis, H2: Baldrige assessment framework has a positive impact on Organization's behaviour regarding innovation.

Sub-question 3: What is the effect of Baldrige assessment framework on Organization's innovation culture?

Hypothesis, H3: Baldrige assessment framework has a positive impact on Organization's innovation culture.

Sub-question 4: What is the effect of Baldrige assessment framework on Organization's innovation's resources?

Hypothesis, H4: Baldrige assessment framework has a positive impact on Organization's innovation's resources.

Sub-question 5: What is the effect of Baldrige assessment framework on Organization's innovation's processes?

Hypothesis, H5: Baldrige assessment framework has a positive impact on Organization's innovation processes.

Sub-question 6: What is the effect of Baldrige assessment framework on Organization's innovation measurement?

Hypothesis, H6: Baldrige assessment framework has a positive impact on Organization's innovation's measurement.

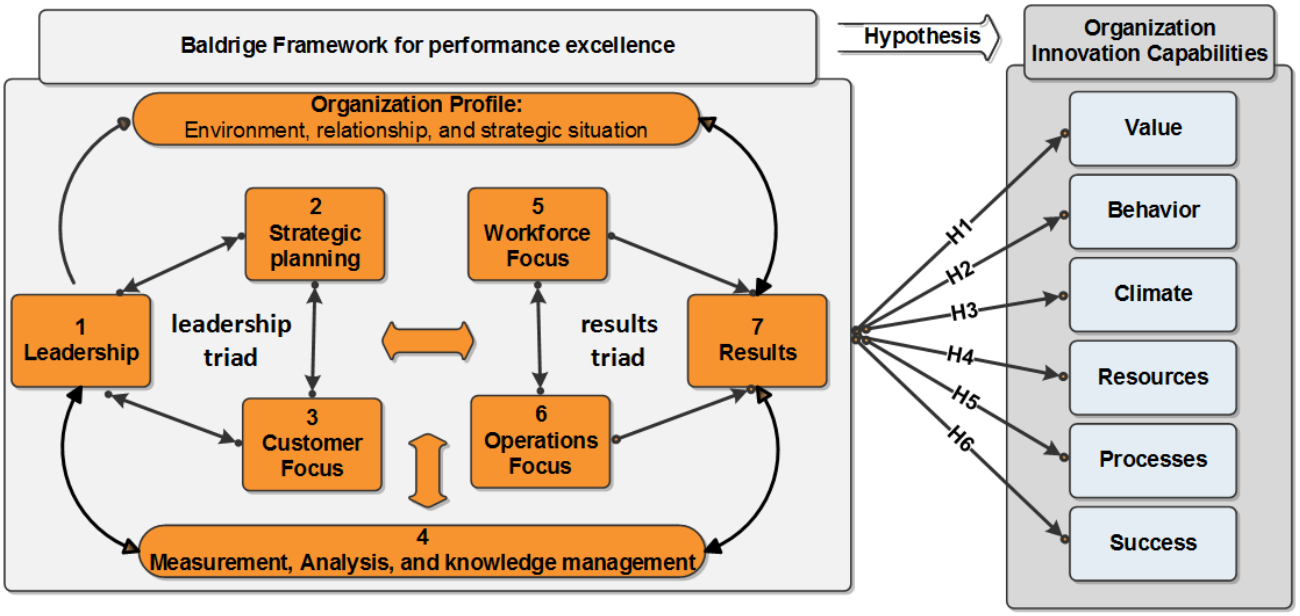

Figure 2: Research Model

Research objective

The objective of this research is to study the effect of Baldrige program on organizations innovation capabilities, and to show that this business performance excellence program can help and guide organizations to conduct the required holistic changes to improve organizations innovation' capabilities.

Research Gap

According to literature, there is very little in-depth research on how organizational capabilities for innovation are developed in practice (Börjesson & Elmquist, 2011). In the Baldrige side, a recent study shows that limited amount of scholarly research has been performed using the Baldrige Criteria and applicant data (Evans & Mai, 2014). The study argues that rigorous research on the impact and effectiveness of the Baldrige program is still nascent.

This dissertation research addresses both calls from organizational capabilities and Baldrige program literatures. In this study, the effect of Baldrige program on organization innovation capabilities will be assessed and analyzed (Figure 1.0).

Expected contribution

This study will contribute to both theoretical body of knowledge and practice. In theory, this study will contribute to organizational capabilities theory through suggesting Baldrige program as a practical and systematic framework for improving organizational capabilities for ordinary capabilities and dynamic/innovation capabilities.

In practice, this study will help convince organizations leaders and senior managers that Baldrige program can be used as a framework to guide the organization step by step in assessing its current capabilities, identifying the gap in its ability to innovate and then systematically developing and improving the skills, knowledge and processes that are needed to support organization's innovation.

Research Assumptions

In this research, several assumptions have been made. First, this study assumes that organizations participating in Baldrige program know about innovation and have the intentions to innovate. Secondly, participating employees in the survey are active in their organization and are aware of their organization innovation efforts. Third, This study assumes that organizations are participating in Baldrige (Florida Sterling) program to improve their performance excellence and not for just winning a state award.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This literature review covers multiple areas of interest as I am trying to link more than one discipline to come up with an innovative research topic for my PhD. Dissertation. My research links three main bodies of knowledge; Total quality management systems represented in Baldrige program, Organization's innovation, and organization's capabilities. As I went through the literatures and papers that cover these bodies of knowledge I managed to scope the research to focus on Organization's innovation/dynamic capabilities area of study and how they are affected by a total quality management system such as Baldrige Performance Excellence Program.

Methodology

The literature review started with collecting past literature reviews on the different bodies of knowledge to understand the current status and know the important and significant research studies in the field. Several key words were used in the title such as "organization's innovation", "innovation capabilities", "Baldrige" and "performance improvement" in the following electronic databases: Science Direct, Proquest, Emerald, and Google scholar. Peer reviewed mark was checked during the search. However, some references (less than 10%), mostly related to Baldrige, are either books or manuals and are not considered peer-reviewed articles. Selection criteria were based on number of citation for papers published before 2010, as I selected the most cited papers, the ones that have been referenced at least more than 5 times a year, many of the selected papers are referenced hundreds of times. Also the journal name was used to assess the

quality of the paper for articles that have been published in the past two years with low number of citations.

Innovation

Literatures reviews show no common definition for the term "innovation", which lead to confusion and challenges in qualifying innovation activities to advance the body of knowledge (Cooper, 1998; Zairi, 1994). The different understanding of innovation is mainly attributed to the vast studies on the topic in diverse fields of knowledge and by different communities of researchers (F. Damanpour & Aravind, 2011). Lack of communication between these different communities added some degree of fuzziness to the basic concept of innovation (J. Fagerberg, 2004).

Different definitions of innovation have been offered over the years. As early as 1934, J. Schumpeter defined innovation as a phenomenon that includes any of the following: 1) introduction of a new good; 2) introduction of a new method of production; 3) opening new market; 4) opening up a new source of supply for raw material; 5) creating a new organization structure. Another early definitions of innovation stated, "Innovation is the generation, acceptance and implementation of new ideas, processes products or services" (Thompson, 1965). At the organizational level, Innovation is defined as "any idea, practice, or material artifact perceived to be new by the relevant unit of adoption" (Zaltman, Duncan, & Holbek, 1973). Innovation is defined as "the generation, development, and adaptation of novel ideas on the part of the firm" (F. Damanpour, 1991). Another definition which was also quoted in 2009 (Wong, Tjosvold, & Liu, 2009) states "Innovation can be defined as the effective application of

processes and products new to the organization and designed to benefit it and its stakeholders" (West & Anderson, 1996). At the managerial level, innovation includes any policy, structure, method or process, or any product or market opportunity that the manager of an operating unit perceives to be new (Nohria & Gulati, 1996).

Some scholars tie innovation with "change", they see innovation as a driver for change that is needed due to external market pressure or as strategy to influence the external market (F. Damanpour, 1996). While innovation results in change, not every change is innovation. Researchers use the word "new" to distinguish innovation from regular changes (Johannessen, Olsen, & Lumpkin, 2001; Slappendel, 1996). Also the amount of change resulted from an introduced innovation depends on the organization's resources, capacity, strategy, and need (Baregheh, Rowley, & Sambrook, 2009).

The common theme in all different definitions of innovation is the key word "new", a further definition went on assessing the relativeness of the idea to the adopted entity, "As long as the idea is perceived as new to the people involved, it is an 'innovation' even though it may appear to others to be an 'imitation' of something that exists elsewhere" (Van de Ven, 1986). Using the same concept of referent entity, Innovation is defined as an idea, practice or object that is perceived as new by an individual or other unit of adoption (E.M. Rogers, 2002).

Sometimes people confuse innovation with invention. While invention is the process of developing or generating a new idea and make it workable, Innovation on the other hand is the process of converting this new idea into application used by customers and commercially accepted in the market (Roberts, 2007). So a new workable idea will remain as an invention until

this idea goes through a process of manufacturing, marketing, and sales and get accepted by the customers. Producing an economic value is the main distinction between invention and innovation (Garcia & Calantone, 2003)

In addition, an invention requires technical knowledge in the field to come up with a new workable idea, However, innovation requires the rest of skills needed to successfully carry this idea from the lab or testing field to the outside world, such as manufacturing, management, marketing, financing skills. (Jan Fagerberg, 2006; Garcia & Calantone, 2003; Roberts, 2007). So innovation is the process of converting a static idea into a dynamic living product, process, or concept.

Innovation always follows the introduction of an idea, in some cases there is a considerable amount of time, years or decades, separate an invention from innovation. This could be due to lack of required infrastructure, major input, complementary product, or basically insufficient needs (Jan Fagerberg, 2006). For example, when Microsoft introduced the tablet PC in 1999, after a decade of trials by other companies, the product failed in the market due to lack of wireless infrastructure as requirement for mobility and lack of developed applications. On the contrary, when Apple introduced its tablet "IPad" in 2010, ten years later, the wireless infrastructure was everywhere, the need for such convenient mobile device was there, and a market full of applications for this new device was in place. All these factors led to a big success for the Apple IPad, as it turns to be a big hit and created a new market in the industry and a new source of revenue for Apple.

This distinction between invention and innovation led to the following equation: Innovation = Invention + Exploitation, where invention covers the seed of the workable idea and exploitation covers the commercialization part of it (Roberts, 2007)

Latest studies in the field defines innovation comprehensively as "production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems. It is both a process and an outcome" (Crossan & Apaydin, 2010).

In summary, there are various definitions for innovations, which, basically depend on the researcher background and area of study. Even though the definitions vary, but most importantly, all researchers agree that innovation is something new that adds value to the organization.

While there has been a growing interest in the concept of open innovation from the early 2000s, one of the major challenges facing empirical research today is to understand the learning mechanisms that might benefit from open innovation (Geenhuizen & Soetanto, 2012).

Classes (magnitude) of innovations

Innovation classification is used to differentiate innovations based on their magnitude of innovativeness, newness, or degree of departure from existing line of innovation. Current literature shows the following different classifications:

Dichotomous classification: radical/routine (Meyers & Tucker, 1989), discontinuous/continuous (Anderson & Tushman, 1990), innovation/re-innovation (Rothwell &

Gardiner, 1988), Evolutionary/revolutionary (Utterback, 1996), sustaining/disruptive (Christensen, 1997), Radical/incremental (Balachandra & Friar, 1997; Freeman, 1998; Kessler & Chakrabarti, 1999), innovative/incremental (Schmidt & Calantone, 1998), really new/incremental (Song & Montoya- Weiss, 1998).

Triadic classification: discontinuous/dynamically continuous/continuous (Robertson, 1967), low innovativeness/moderate innovativeness/high innovativeness (Kleinschmidt & Cooper, 1991), incremental/platform/radical (Wheelwright, 1992).

Despite the different naming convention, All researchers agreed on the two extreme ends of definition for the innovation classification, as they defined continuous/incremental/routine/re-invention innovation as a miner or regular improvement of an existing product with no market disruption or creation (Anderson & Tushman, 1990; Meyers & Tucker, 1989; Robertson, 1967), while discontinuous/radical/revolutionary/discontinuous innovation creates new products that disrupts current market and create a new one, change customers behaviors and create new trend (Anderson & Tushman, 1990; Meyers & Tucker, 1989; Robertson, 1967)

The different classifications are a result of different views by researchers in different fields. One view develops its classification based on firm and industry existing knowledge, skills, and production techniques. Based on this view, a radical or disruptive innovation will change current firm and industry investment in the existing knowledge, skills, and production techniques. Incremental or continuous innovation will keep building on existing knowledge, skills and production technique (Utterback, 1996). Another view looks into the level of departure from existing technological innovation, and whether this departure creates a new market or not

(Rothwell & Gardiner, 1988). A third view focuses on level of newness to the world, market, and firms (Kleinschmidt & Cooper, 1991).

These different classifications have resulted in classifying a certain innovative product differently, For example, certain innovation might be classified as radical innovation based on one view in the meantime it's classified as moderate innovation by another view. Some time the same innovation is classified with the same magnitude by the different classifications but with different labels such as, high innovative, radically new, or disruptive innovation (Garcia & Calantone, 2003).

While different classifications in literature introduced over the years by different researches in an effort to define the magnitude of the innovation output with more precision, lack of standardization and the use of different innovation labels confuses the market and managers who work on producing and managing innovative outputs.

Types of innovations

The identification of different types of innovations is attributed to Schumpeter's early work. Schumpeter distinguished between five different innovations: new products, new methods of production, new sources of supply, new market, and new ways to organize business (Jan Fagerberg, 2006; Godin, 2002). However, most studies focuses and differentiate between the first two; product, and process innovations (Cooper, 1998; F. Damanpour & Aravind, 2011; Jan Fagerberg, 2006; Utterback, 1996; Zaltman et al., 1973)

Another classifications of innovations, mostly interested in organizational development, distinguish three types of innovations; product/service innovation, process innovation, and business model/organizational innovation (Crossan & Apaydin, 2010).

The organization for economic cooperation and development (OECD), consist of 30 countries from Europe and America, defines and distinguishes between four types of innovation in the published Oslo manual, these four types are; product innovations, process innovations, organizational innovations and marketing innovations (Publishing, 2005).

Five different types of innovations were also identified as part of organization's overall innovativeness; product innovativeness, market innovativeness, process innovativeness, behavioral innovativeness, and strategic innovativeness (C. L. Wang & Ahmed, 2004).

The literature provides the following definitions for the four most known types of innovations: product, process, marketing, and organizational innovation.

Product innovation

Product innovation is defined as improving existing or producing a new product or service with new capabilities and features new to the market (Publishing, 2005). The focus of product innovation is external to the organization as the goal is to meet customers needs (F. Damanpour & Aravind, 2011; Utterback & Abernathy, 1975), Timing of introducing the product to the market is a critical factor in the definition of product innovation (C. L. Wang & Ahmed, 2004).

Process innovation

Process innovation is defined as the introduction of a new method in the organization to produce a product or render a service (F. Damanpour & Aravind, 2011; Publishing, 2005; C. L. Wang & Ahmed, 2004). The focus of a process innovation is internal to the organization as the goal is mostly efficiency improvement through cost cutting and reducing development time for products (Cohen & Levinthal, 1990; J. Fagerberg, 2004; Frishammar, Kurkkio, Abrahamsson, & Lichtenthaler, 2012; C. L. Wang & Ahmed, 2004).

Organizational innovation

Organizational innovation is defined as a new configuration of organizational capabilities or developing a new way of doing business or introducing major changes to current business practices within organizations (Armbruster, Bikfalvi, Kinkel, & Lay, 2008; Carayannis & Provance, 2008; Publishing, 2005). In the context of economic development, Schumpeter defined organizational innovation as "The carrying out of the new organization of any industry, like the creation of a monopoly position or the breaking up of a monopoly position" (F. Damanpour & Aravind, 2011). Wang and Ahmed (2004) view this model of innovation as a strategic innovation, which they define as defining market gap and developing a new strategy to cover this gap and create value for the firm.

Marketing innovations

Marketing innovation is defined as implementing new marketing channels and methods, such as new promotions ideas, new pricing structure, new packaging (Publishing, 2005; C. L.

Wang & Ahmed, 2004). Marketing innovation is more involved with opening new markets, product positioning, better understanding customers needs, and increasing sales (Gunday, Ulusoy, Kilic, & Alpkan, 2011)

Innovations are also categorized as either technical or administrative innovations, this is popular among organizational and management researchers. Technical innovation refers to novel technological methods that effect production of products and services, while administrative innovation is mainly concerns with organization's activities that affect management systems (F. Damanpour & Aravind, 2011). Another differentiation between the two types of innovation is that technical innovation address changes that have direct influence on the core business of the organization, such as new services or new products, while administrative innovation address novel changes that has indirect influence on the core business such as management related activities (S. Gopalakrishnan & Damanpour, 1997).

The different types of innovation has a link to the magnitude of innovation; As incremental innovation is mostly associated with product/service or process innovation, and radical innovation is associated with business model that is part of the organizational innovation, even though radical product innovation is the focus of many organizations (Crossan & Apaydin, 2010).

Innovation referent dimension

Innovation referent defines innovation newness in reference to an entity such as the end customer, the adopting organization, or the market. For example, a product or service might be new to the customer (C. L. Wang & Ahmed, 2004), organization (Davila et al., 2006), or market

(Lee and Tsai, 2005) but not to another entity. Innovation referent dimension is linked with the magnitude of innovation, as the degree of innovativeness from highly innovative to low innovative can be seen differently by different adopting entities. Most studies take the organization's perspectives as a referent towards the magnitude of innovation more than other entities (customers, market) (Garcia & Calantone, 2003).

Innovation levels of analysis

Literatures shows that innovation analysis has been conducted at different levels; individual, team, organization, industry, region, and nation. The macro level analysis study innovation at the market, industry, region and nation level. The micro level analysis studies innovation at the individual and team level. And the in between "meso level" studies innovation at the organization level. Innovation is a multilevel phenomenon, however, literature shows that most studies were conducted at specific levels and not across multiple levels (Gupta, Tesluk, & Taylor, 2007).

Studies of innovation at the Individual level concentrates on the factors that determine individual creativity. Two directions are used to evaluate innovation at the individual level, one that treat individual as an entity and creativity as an output of personal traits, the other look at the individual as part of a working environment which has much effect on the personal creativity output. Studies at the team level concentrate on fostering group creativity and interaction among group members. Studies show that teams with high number of diverse members working together for long time demonstrate higher performance. The majority of researches are conducted at the organizational level with three main areas of studies; technological innovation, product or

business development, networking among organizations and its effect on organizational innovation. Studies at the industry level focus on the interaction among organizations forming the industry and the diffusion of innovations. The analysis at this level covers the effect of the cooperation and competitive nature among organizations in an industry on the emergence and diffusion of innovations. Studies at the region and nation levels focus on the determination of innovation and variation of innovation capacity across regions and countries, Studies did not focus on the management of innovation as much as the interaction among individuals and firms as well as the diffusion and creation of innovation (Gupta et al., 2007).

The studies of different levels of analysis for innovation shows that organizations do not innovate in isolation, but they interact with their environment horizontally and vertically which create a system or network of innovation (Jan Fagerberg, 2006).

In this research, innovation is analyzed at the organization level, the relationship between organization innovation and organization performance excellence is the target of this study. Researches related to the macro or micro levels will not be covered in this study.

Diffusion of innovation

Innovation diffusion is the process of disseminating an innovation to target customers over a period of time (Everett M Rogers, 1995). Certain innovations get adopted quicker than others because diffusion of innovation is affected by four main factors; the innovative product that need to be diffused, the channels of diffusion, time, and the target customer (E.M. Rogers, 2002). The characteristics of each innovation define the rate of adoption by the intended customers. These characteristics are:

- Relative advantage: the degree an individual perceives the innovation as advantageous.
- Compatibility: the degree of consistency of an innovation with existing value and previous experience.
- Complexity: the degree to which an innovation is perceived hard to use or understand.
- Trialability: the degree to which an innovation may be experimented with for a limited period of time.
- Observability: the degree to which the result of an innovation is visible to others.

An innovation that has perceived greater relative advantage, compatibility, trialability, observability, and less complexity is adapted more quicker than other innovations (E.M. Rogers, 2002).

Organization Innovativeness and innovative capacity

Innovativeness is defined as the propensity of an organization to develop or adopt new ideas and use them to develop new products (F. Damanpour, 1991; Ettlie, Bridges, & O'keefe, 1984; Garcia & Calantone, 2003; Hurley & Hult, 1998).

The literature shows diverse understanding and dimensions for organizational innovativeness, Hurley and Hult (1998) state that organizational innovativeness is associated with the organization's culture that is characterized by emphasis on learning, participation in decision making, support and collaboration, tolerance to conflict, market focus, and power sharing, They argue that these characteristics are antecedents to organizational innovativeness.

Another empirical study argues that market orientation (activities related to generating, disseminating, and responding to market intelligence), learning orientation (the development of new knowledge), and entrepreneurial orientation (proactive risk taking through creating new products and entering new market) are three key antecedents to organizational innovativeness (Hult, Hurley, & Knight, 2004). Capon et all (1992) use four dimensions for defining organizational innovativeness; market-related growth, technology-related revenue, tendency to pioneer, and technological sophistication. Wang and Ahmed (2004) define five dimensions to determine organizational innovativeness. The five dimensions are product innovativeness (perceived newness of product), market innovativeness (innovation related to market research, advertisements and promotion), process innovativeness (new production method or new management approach), behavioral innovativeness (internal organizational receptivity and reaction to innovations), and strategic innovativeness (identifying gaps in the industry and seek new markets to create value to the organization).

While old studies used product innovation and organizational innovativeness interchangeably (Capon, Farley, Lehmann, & Hulbert, 1992), other scholars differentiate between organizational innovativeness and product innovativeness, they argue that product innovativeness measure the degree of product newness to the customer, organization, or market (Atuahene- Gima, 1995; Danneels & Kleinschmidtb, 2001), and it does not measure or reflect organizational innovativeness accurately, as a matter of fact, using product innovativeness as an only measure for organizational innovativeness is a very narrow view of organizational innovativeness (Garcia & Calantone, 2003).

Hurley and Hult (1998) suggest that organization innovativeness along with other organization aspects, such as age, planning, formalizations, differentiation, market intelligence, increase the organization's capacity to innovate. Organization capacity to innovate can be measured by the numbers of innovations developed or adopted successfully, The higher innovation capacity an organization has the faster and more successful the organization will respond to changes in the market. The higher the organization capacity to innovate the more competitive and better performance the organization is in the market (Hurley & Hult, 1998).

Innovative capacity, innovative capability, and absorptive capacity terms have been used in different studies for almost the same meaning and concept. In one study innovative capability and absorptive capacity are used synonymously and are defined as the organization's ability to identify the importance and value of new external information, understand it, apply it, and commercialize it in the market successfully (Cohen & Levinthal, 1990). Another study states that innovative capacity and absorptive capacity are relative and are measured by the number of successfully adopted innovations (Hurley & Hult, 1998).

Process of innovation

Innovation as a value chain

Innovation process could be viewed, as a value chain comprised of three phases: idea generation, conversion, and diffusion. Six tasks are linked together across these different phases to form a chain. Internal, external, and cross-unit collaborations to generate ideas; screening and development of ideas to convert them into product; then spreading developed ideas within and outside the company as part of the diffusion phase. Weakness in any link of the chain could

break the innovation efforts. The value chain view of the innovation process could help in focusing on the weakest link and work on improving it to increase the value of innovation with organizations. Several practices can be used to strengthen these links; building external networks to extract and pass customers needs to R&D labs and partners for solutions, also building internal networks, communities of specialized groups from different units of the organizations to solve specific problems; establish cross unit funding to support and develop radical ideas, establish a separate business unit to develop new ideas that support the organization strategy, this create a safe heaven for potential ideas; and designate idea evangelists to support the diffusion of the developed product (Hansen & Birkinshaw, 2007).

Innovation and organization performance

Innovation has been linked positively with performance ever since the introduction of innovation concept through the work of Schumpeter in 1934 and 1942, his theory states that firms maintain temporary quasi monopoly through innovation that allow firms to extract rents, however this temporary lead in the market can be eroded due to imitators from competitors or a new innovation that put the leading firm's innovation to obsolete. With distinctive innovations, organizations establish dominant position in the competitive market, and provides new entrants a foothold in the market (Danneels & Kleinschmidtb, 2001). But to maintain sustainable competitive advantage, firms must continue to innovate to utilize better productive processes and keep up with changing customers' needs and demands (Gunday et al., 2011).

According to literatures, Four different types of performance dimensions are used to define organization performance, these are financial performance, production performance, market performance, and innovative performance (Gunday et al., 2011)

The literature also shows an increase number of studies that address the effect of innovation on organization performance in recent years (Rubera & Kirca, 2012). While there is a general agreement among researchers that innovation influence business performance (Hult et al., 2004; Szymanski, Kroff, & Troy, 2007), some other studies show neutral effect (Lin & Chen, 2007; Subramanian & Nilakanta, 1996).

The link between innovations and performance was also extended to cover other dimensions beside types of innovations; for example, quickness and speed in adopting new innovations and number of adapted innovations were tested against organization performance, and the study concluded that both speed and amount of adopted innovations have positive influence on organization's financial performance (Shanthi Gopalakrishnan, 2000). Another study tested the effect of magnitude of innovation on organization's performance, specifically profit, economic rent, and risk, using data on new products from consumer packaged goods industry, the study concluded that incremental innovation preserve companies' value and keep the company in the market with no additional risk, however, radical innovation increase values for the companies, allows to achieve long term growth with high associated risk that is usually offset by increase stock returns (Sorescu & Spanjol, 2008).

The literature shows that most studies on the relationship between firm innovation and firm performance measure the effect of different types of innovations (product, process,

organizational) as a whole or more than one type of innovation (process-product, organizational-process, or organizational-product) on firm performance (Calantone, Cavusgil, & Zhao, 2002; Hult et al., 2004; Hurley & Hult, 1998; Jenssen & Rand, 2006; Keskin, 2006; Ortega, 2010; Yang, Marlow, & Lu, 2009). Studies also show that different innovation's types influence each other, thus several innovations types might need to be implemented at the same time to achieve a better performance results (Walker, 2004).

The various impact of different types of innovations on organizational performance encourage studying each type of innovation and assess its impact on the performance of the organization (Publishing, 2005). New studies proofed that different types of innovations have different influence on organizational performance (Gunday et al., 2011).

Organizational innovation and performance:

Literatures shows that studies on the relationship between organizational innovation and organization performance scarce and mostly old (Mol & Birkinshaw, 2009). While old studies showed little evidence on imperial relationship between organizational innovation and organization performance, A study conducted in 2006 confirmed that organizations that have better performance are more involved in innovative organizational changes (Mazzanti, Pini, & Tortia, 2006). Changes introduced by organizational innovation, such as new organizational method in a firm's business practices, workplace organization, or external relationships have to be new to differentiate it from other regular changes in the organizations (Armbruster et al., 2008; Birkinshaw, Hamel, & Mol, 2008).

Another study was conducted in china to study SME innovation effect on their performance, and the result showed that administrative innovation in terms of wide and new organizational changes leads to increase of sales, which is the measure used to assess the organizations performance in the study, (Lin & Chen, 2007).

Mol and Birkinshaw (2009) confirmed a positive relationship between the introduction of new management practices and future improvement of organizaion performance. The perfromance measure in Mol and Birkinshaw study was based on the productivity growth within the organization, they argue that other measures of performance such as stock market has the market condition as an exogenous factor and does not reflect pure results of organizational innovation. Another study conducted in China and Hong Kong to test the effect of organizational innovation on organization performance with two different institutional context; chinese transition economy, and hong kong market economy. The study confirmed that organiational innovation effects the performance of organizations in transtional economy more than product innovation, and the opposite was also confirmed in market economy such as in hong kong (Luk et al., 2008). This study also confirmed that the institutional context may effect the result of organization perfromace that occur due to organizational innovation.

Camisón and Villar-López (2012) also confirm the relationship between orgnizational innovation and organization performance using a resource-based view theoritical framework. They tested different innovation's types (organizational, process, and product) and their effects on the performance of the organization as part of the imprical study condusted on 144 spanish industrial companies. Organizational innoavtion turned out to be as important as other types of

innoavtion as studies show better organization performance is resulted when organizational innovation is considered along with other innovations types (product/process) (Carayannis & Provance, 2008)

Process innovation and performance:

Process innovations are assumed to enhanced efficiency of organizations and thus achieve competitive advantage in the market (Baer & Frese, 2002) through internal savings that lead to competitive pricing offerings in the market (Gunday et al., 2011) and cost leadership . Cost cutting and saving is always tied with process innovation as stressed in the literatures (J. Fagerberg, 2004). Beside operational savings, Organizations employ process innovation to improve delivery lead-time (Fariborz Damanpour, 2010). According to Gunday et al. (2011) Process innovation has a positive effect on organization's innovative performance that act as a mediator to production and market performance. A new study confirmed that process innovation also has an indirect effect on organization's performance when it is mediated by the development of product innovation capability (Camisón & Villar-López, 2012). Process innovation is crucial for organizations as the competitive advantage and economic improvement lies in the innovative use of technologies, not in the development of new technologies (Stone, Rose, Lal, & Shipp, 2008).

Product innovation and performance:

Literatures shows that among all the innovations types, product innovation is the most type examined and the one that has most effect on performance compared to other types of innovations (Gunday et al., 2011), unlike process innovation that mostly has internal focus,

product innovation has an external focus and drive organization's effectiveness through responding to customers need and capture market (Fariborz Damanpour, 2010). A study showed that, hard to copy, new product innovations will help organizations maintain their market leadership and cash-flow (González-Alvarez & Nieto-Antolín, 2005), Another study confirmed this using stock market value as the performance measure (Srinivasan, Pauwels, Silva-Risso, & Hanssens, 2009). The same study also tested the radical type of product innovation, and it concluded that a new to the market product (radical innovation) has seven times the impact of a new to the organization product (incremental innovation). Similar conclusion of radically innovative products result in higher performance impact was introduced in a recent meta-analysis study (Rubera & Kirca, 2012). These conclusions match with the resource based view (RBV) study (J. Barney, 1991), which states that firms with distinctive resources that are rare, valuable, inimitable, and substitutable achieves superior performance and sustained competitive advantage. Hard to copy radical innovative products have the distinction of rare, valuable, and inimitable at least for some time.

Marketing innovation and performance:

Marketing innovation is critical for organizational performance, as targeting new markets or new segment and creating new way to promote products increase the success rate of a new product and increase sales. Market research that identifies new market practices and new customer demands are crucial to product and process innovation (Publishing, 2005). Sorescu & Spanjol (2008) confirmed in their study that marketing innovations represented in new packaging and merchandising innovation can be a source of significant economic rent.

The literature shows a wide variety of studies that tried to explain the effect of innovation on organizations performance, however, due to the different understandings and views on innovations, the organization's level innovation studies are fragmented, also the use of different categorizations of innovation and different performance measurements lead to contradictory results, this was mainly due to lack of agreement on innovativeness or performance measures. Finally, most studies were conduced in developed countries; more studies are needed in developing countries to better generalize the relationship between innovation and performance.

Measuring organization innovativeness

Measuring innovation is very important; a survey conducted by McKinsey in 2008 found that companies that measure their innovation activities have the highest return from innovation. About 70% of the interviewed firms indicated that innovation is in the top three priorities in their organization agenda. Measuring innovation allows for proper resources allocation, management and improving of the overall innovation performance (Stone et al., 2008).

Innovation is a complex, nonlinear, and unpredictable phenomenon with multi facet and dimensions. These various dimensions of innovation illustrate why innovation activities are a difficult to measure. (Stone et al., 2008). The difficulty of measuring innovation also comes from the fuzziness in the innovation concept and definition, as some define innovation as an output of an R&D and other activities, while others define innovation as the activities and R&D that leads to innovative output, this make innovation measurement a complex and difficult process (Feeny & Rogers, 2003; Godin, 2002). Since there is no single and fix method to innovate, using one dimension to measure innovation is likely not accurate (Shapiro, 2006; Stone

et al., 2008). Several indicators have been used over the past decades to measure innovation in organizations. These indicators vary from input indicators, to output indicators, to activities or process indicators. The literature shows that innovation metrics have evolved over the years; starting with input indicators that was the main measurement for innovation in 1950s -1960s, then output indicators came as next generation measurement in the 1970s -1980s, third generation indicators emerged during the 1990's with focus on innovation surveys, indexing, and benchmarking; the fourth generation indicators started in the early 2000 and focus on process indicators that mostly measure intangibles activities to assess innovation (Stone et al., 2008). The following is a summary of most known indicators:

Innovation output indicators:

Output indicators represent the results of innovations activities within or outside (collaboration with external organizations) the organization, these include all types of innovation output (products, processes, marketing, organizational), it also include number of patents, percentage of revenue from innovative products (Godin, 2002)

1. **Number of Patents:** patent statistics are the most commonly used measure for innovation output. Patent gives firms a temporarily monopoly to use their discoveries, It is an incentive given to firms to continue innovate. Patent data has several advantages; it is available all time, shows collaboration with other organizations, and shows technological level. However, these advantages come with drawbacks, not all innovations are patented, some innovations are covered by multiple patents, also not all patents are considered innovations as many patents might not end up in the market. In addition,

different industries have different propensity to apply got patents. (Brenner & Broekel, 2011; Publishing, 2005)

2. **Number of innovations:** counting innovations over a period of time, for example between 2010 and 2013, using experts' opinions. The advantage is that this will provide a direct measure of innovation output, however, the downside of it are the high cost and efforts to identify these innovations, also this methods can't be immune to selection bias (Brenner & Broekel, 2011).
3. **Percent of revenues from new products:** a quantitative method that is easy to understand and use to measure innovativeness of organizations. It can be integrated with an accounting system to automate this measurement once innovative products are defined in the system. However, just like other methods of measurement, this measure has some issues; perhaps identifying the innovative product is a major one, companies update their products frequently; so does any change count as a new? How much update is required to consider a product as innovative? What if the process of manufacturing a product or rendering a service changed but the product or the service itself did not, cost will go down but revenue might be the same. Another issue is related to the time, for how long will this new product be measured? One year, two, or more. A predefined period of time is required to measure the percent of revenue out of a new product, and this time frame is different from one industry to another, in high tech industry one year might be a suitable time frame, however, one year is not enough to measure revenue coming out of new products in oil industry. Product life cycle is different from one industry to another and this might change the time frame for measuring revenue from innovative products. Third

issue deals with the type of innovation, while pure product innovations (product or service) can be measured easily with this approach, process, organizational, or marketing innovation need extra thinking to be measured. Perhaps even harder if a mix of innovations are used such as a mix of product with process or product with marketing or product with new business model (Shapiro, 2006).

4. **Percent of revenue from new platforms**: another quantitative method proposed to overcome the limitation of measuring percent of revenue from new products. This method help measuring other types of innovations (i.e. process, organizational, marketing). Revenue from platform could be an input indicator, but it's mostly measure the output of the types of innovations. New platforms could be new machineries in a production line, new organization policies, new marketing channels, or new process in delivering services or products. Just like revenue from new product, revenue from new platform has similar issues, such as defining new platform and whether new is considered an innovative or not. Also time frame could be longer here than in revenue from new product (Shapiro, 2006).

Using the output only to measure innovation treats the innovation process as a black box; all the interactions inside the box (activities) are not used to measure the firm innovation, which result in missing many aspects of the efforts and activities used in producing the innovative outputs.

Innovation input indicators:

Input indicators represent all the efforts and resources, tangible and intangible, put into the innovation system within an organization to innovate. These inputs include human capital,

R&D and non R&D expenditure, number of people devoted to innovation number of ideas or concepts being generated. R&D expenditure is a critical innovation input; most innovative companies' invest in R&D to continue innovating in their market. Thus measuring R&D expenditure thought to be a good assessment for innovation since the information of R&D expenditures are usually available within firms' accounting systems (Brenner & Broekel, 2011). However, even though R&D plays a major role in the innovation process, not all innovations are based on R&D activities. In a recent survey conducted by economist intelligent Unit, half the respondent said that their best ideas came from industry and market structure change and only 21% said that they came from R&D (Unit, 2007), as matter of fact many innovations relies on high skilled workers, interactions with external organizations, and organizational structure and propensity to innovation (Publishing, 2005). Using R&D expenditure only might not be an accurate measure as studies show that less than 10% of innovation cost is attributed to R&D expenditures, This confirms that R&D only dimension is not enough measurement for innovation (Godin, 2002).

Innovation process indicators:

The innovation process indicators covers all the activities that an organization take internally and externally to innovate. They are mostly intangible indicators that have produce innovation outputs and improve performance in organizations (Carayannis & Provance, 2008). Latest studies shows that collaboration with external organization as oppose to organization's internal knowledge represented in R&D, turns out to be more critical for organizations to innovate (Powell, Koput, & Smith-Doerr, 1996). Open innovation became a strategic direction

for many organizations to innovate, it allows for exploring broader solutions, in the meantime reduce risk and cost associated with internal R&D activities (Stone et al., 2008). Firms collaborate, share resources, and human capital with partners (external organizations) and all this contribute to improve organization's innovations (Brenner & Broekel, 2011) .

Multi-dimensions indicators:

Using a mix of input, output and process indicators to measure innovation (Carayannis & Provance, 2008; Feeny & Rogers, 2003). The use of multiple indicators overcome some of the limitation with single dimension measurement, however, the literature shows that this approach is still underdeveloped as very few studies addressed this approach (Carayannis & Provance, 2008). This approach might bring more accuracy in measuring innovation, however this will add to the complexity of the measurement process.

In general, two main approaches are used to measure innovation: aggregate indicators and monetization. The aggregate indices approach combines multiple indicators to come up with an innovation measure. This approach was first used at the national level where the European union community innovation surveys used to measure and compare innovation in EU countries. Aggregate indices collect wide variety of innovation factors related data that is mostly qualitative in nature. This approach help compare and discriminate between different innovative entities and units, which is one of the main focus of EU governments, however it does not provide any descriptive analysis of innovation and knowledge of innovation process, on top of that aggregate indices are a complex measure and has limited financial data. The monetization approach measures the ins and outs of innovation dollar sign to assess innovation. It measure the

investment in innovation systems and infrastructure and expenditures of innovation activities and then measure the revenue and other nontangible income from innovation activities to come up with the innovation value within a unit or entity. The monetizing approach is easier than the indices approach and offers an insight into the innovation process (Stone et al., 2008).

Innovation measurement is well established and standardized at the nation levels with community innovation surveys being used in Europe and many other countries in Asia, America, and Africa. The Oslo manual provides a complete framework for collecting innovation data. In the other side, there is no standard measurement or framework for measuring innovation at an organization level; different organizations establish different methods and processes for measuring their innovation activities.

Data collection methodology:

Defining what type of indicators to use and collect to measure innovation is one issue of the process of measuring organizations' innovation, Deciding on a method to collect innovation data is another issue that is still being researched to find better methods to collect data accurately. The literature shows that surveys are the most common method for collecting innovation data in comparison to other methods, focus group and interview.

- **Survey:** surveys are one of the most common used tools to collect innovations information from organizations. European union (EU) use Community Innovation Survey (CIS) base on the Oslo manual developed by the Organization for European Economic Cooperation (OECD) (Brenner & Broekel, 2011; Smith, 2005). Advantages of surveys are simplicity, wide reach, and collection of detailed information on various innovation

types (i.e. product, service, process, marketing, organization), and other interesting information regarding innovation activities such as, R&D and none R&D expenditures, and collaboration. The disadvantages of surveys are as usual accuracy and response rate. The collected data are mostly subjective and highly dependable on the person responding to the questionnaires (Brenner & Broekel, 2011; Godin, 2002).

- **Interview:** provide better response rate in comparison to surveys, it provide responders with clarification option, and it also allows for feedback and checking responder's behavior. However, interview methods is time consuming and hard to conduct with a big sample of organizations (Li & Atuahene- Gima, 2002).
- **Focus Group:** utilize expert opinions to provide information on organizational innovative output. This approach provides direct measure of innovation output, however, it lacks the depth and width or collecting other important data such as innovation's inputs and process indicators. Focus group methods can't be immune to selection bias (Brenner & Broekel, 2011).

Organizational capabilities

Organizational capabilities refer to what an organization can or can not do (Börjesson & Elmquist, 2011). Other scholars define organizational capabilities as the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result (Schreyögg & Kliesch-Eberl, 2007), They view organizations' capabilities as a characteristic that evolve and change over time. Organization

capabilities have been also defined as the capacity to perform a particular activity in a reliable and satisfactory manner (Helfat & Winter, 2011), Helfat and winter see reliability and repeatability as an important feature of capability, otherwise the firm cannot have the capacity or capability to do what intended to be done, they also see organization's capabilities as a key dimension of firm heterogeneity and characteristics that confers competitive advantage. Schreyögg & Kliesch-Eberl (2007) share the same view as they see the different levels of firms' capabilities and resources result in different competitive advantages.

However, despite the various research and interest in organization's capabilities, the concept is still vague, as different authors call it different names; core competence, collective skills, complex routine, best practices, or organizational capabilities (Schreyögg & Kliesch-Eberl, 2007).

Organizations capabilities can be classified as operational or dynamic, Operational capabilities enable organization to perform their current on-going activities using existing skills and techniques to maintain the status quo of the organization, good operational capabilities enable organizations perform current activities efficiently and effectively. However, dynamic capabilities are the ones that enable an organization to change the way it is currently doing business (Helfat & Peteraf, 2003; Helfat & Winter, 2011). Dynamic capabilities are different from operational capabilities, they differ in their purposes and required outcome, however, the line between both types of capabilities are blurry since changes occur all the time, level of changes from regular to radical is not completely defined, and there are some capabilities that can be used for both operational and dynamic purposes such as distribution, marketing, and sales

capabilities (Helfat & Winter, 2011). Helfat & Winter suggest that to distinguish between operational and dynamic capabilities we have to assess the extent, nature, and speed of change that a capability enables, capability that introduces significant economic change is dynamic even if the pace of change is slow. They also suggest that a dynamic capability should not be restricted to new-to-the-world outcome or fast changes to the market, sometime a dynamic capability can help support existing business such as opening new outlets for a store in reaction to market change. Dynamic capabilities are strategic and when used on top of the operational capabilities, organizations can maintain and extend their competitive advantage into the future (David J. Teece, 2012).

Dynamic capabilities was first introduced by Teece, Pisano, & Shuen (1997), they defined it as higher-level competences that determine the firm's ability to integrate, build, and reconfigure internal and external resources/competences to address, and possibly shape, rapidly changing business environments. Dynamic capability was introduced as an extension to the resource based view (RBV) theory (J. B. Barney, 1986), which states that firms achieve sustained competitive advantage through bundles of resources and capabilities, these bundles of resources and capabilities have to be valuable, rare, costly to imitate, and non substitutable for a firm to have a sustained advantage. The RBV theory was static in nature and could not explain the competitive advantage in a continuous changing global environment; dynamic capabilities came to address this gap through aligning the firm's internal and external configurations of resources and capabilities with the external changes in the environment. This view established a link between organizations continuous innovation and their ability to innovation (innovation

capability) (Barreto, 2010; Ellonen, Wikström, & Jantunen, 2009; David J Teece, Pisano, & Shuen, 1997).

Dynamic capabilities describe the ability of an organization to demonstrate timely responsiveness and continuous innovation that is coupled with the management ability to coordinate and updates organization's competences (David J Teece et al., 1997).

Scholars of dynamic capabilities argue that the difference in firms' innovative performance is related to the difference in their dynamic capabilities. A new study linked organization's dynamic capability with its innovative output, the study revealed that the higher an organization dynamic capabilities the higher its innovative output (Ellonen et al., 2009)

Dynamic capabilities are demonstrated by three types of activities: (1) identifying and assessing an opportunity (sensing); (2) mobilization of researches to address an opportunity and capture value from doing so (seizing); (3) continued renewal (transforming). Organizations need to perform these activities effectively to sustain market changes; different organization can maintain some or all of these activities better than others (David J. Teece, 2012).

Capabilities for Innovation

Global intense competition keep pressuring organizations and forcing them to innovate in order to sustain their competitive advantage, thus the ability of an organization to innovate is one of the most critical capabilities that should be possessed in todays business (Lawson & Samson, 2001). Moreover, the rapid development of new products and emerging of knowledge economy require organizations to continuous upgrade their innovation capabilities (C.-h. Wang, Lu, &

Chen, 2008). An innovation is a result of successful implementation of creative ideas, and the level of innovation depends on the organization ability to learn and apply the new knowledge (Alegre & Chiva, 2008), the more ideas an organization implement the higher innovation capability the organization is assumed to have (Francis & Bessant, 2005). Wang and Ahmed (2004) define innovation capability as the organizational ability to produce an innovative outcome. Studies show that different organization's capabilities result in different innovative outputs, some originations tend to produce radical innovations that cannibalize their current knowledge and existing products, while others produce incremental innovations that build and enhance their existing knowledge and existing resources (Ellonen et al., 2009)

Differentiating between ordinary capabilities from innovation capabilities have been identified more than 20 years ago when Kanter (1989) argued that mainstream (ordinary) business capabilities are different from new stream (innovation) capabilities, he further suggested that each capabilities require different resources and need to be managed differently. Mainstream activities provide stable income that funds new stream activities that are needed to develop new products, which later become part of the mainstream autonomous to provide fund for newer new stream activities (Kanter, 1989)

Researchers defined innovation capability as a higher order integration capability that is the ability to mold and manage multiple capabilities (C.-h. Wang et al., 2008), this matches Treece et all (1997) concept of dynamic capabilities that refer to higher-level competences that determine organization's capability to integrate, build, and reconfigure internal and external resources/competences to create innovative products. In another view, dynamic capabilities

explain how organizations manage and deploy its current resources and obtain new resources to continue innovate over time (Cetindamar, Phaal, & Probert, 2009).

Dynamic capability theory is not specific to certain capability (i.e. technological, financing, etc.) it is meant to reflect a combination of capabilities needed to continue innovate at any point of time, these capabilities include management, R&D, manufacturing, sales and marketing, human resources, product & process development and knowledge learning and management (Lawson & Samson, 2001).

Even through innovation is in the central focus of dynamic capabilities, Lawson and Samson (2001) see that dynamic capabilities theory have some deficiencies, they argue that it is hard to identify which capabilities individually or collectively are effective for performance, furthermore, many resources are complementary, which makes it a system of resources and capabilities that matters not individual components. However, they still see that dynamic capabilities approach is well suited to the study of organization innovation due to the fact that it takes a holistic view of organizational innovation and there is no special focus on technology.

Malcolm Baldrige Framework

The Malcolm Baldrige National Quality Award is one of the top programs that help organizations in the US and other parts of the world to improve their quality and increase their overall performance (Evans & Mai, 2014). The award program was the US response to the Japanese Deming prize. During the 1970s and 1980s, the US manufacturing companies where lagging behind their overseas competitors, specially the Japanese companies, this created a major problem for the US economy as customers around the world turned away from American

products. The high quality of the Japanese product surprised the American companies to the point that they had to send representative to Japan to study their methods. They found out that level of defects was much lower in the Japanese factories compared to the American factories, sometime staggering 1000 times lower. When the American started investigating the Japanese methods, they discovered that there is no technique or a tool used to reach this high quality. It was a complete framework of quality management system such as Just-in-time (JIT) and total quality control (TQC) that differentiated the Japanese production and business philosophies from the American counterpart (Loomba & Johannessen, 1997). In 1991, Europe established the European Quality Award (EQA) through the European Foundation for Quality Management (EFQM) to recognize companies with high commitment to quality (Lee, Rho, & Lee, 2003).

The Malcolm Baldrige National Quality Improvement Act passed by the U.S. Congress in 1987 to enhance the competitiveness of U.S. firms and businesses. The purpose of the program is to identify and recognize role-model organizations that demonstrated significant improvement in their goods and services quality, also help other US organizations who seek to improve the quality of their products and services and increase their performance through establishing criteria for evaluating improvement efforts and adopting best practices from award winner organizations. The Baldrige program covers manufacturing, service, none-profit, health care, education, government, small and big businesses (NIST, 2011) Currently, 44 states in the US have a local Baldrige program (Lee et al., 2003)

The MBNQA criteria have evolved over the years to keep up with the changes in the market and to serve different industries and organizations in the nation. It started with focus on

manufacturing quality then in 1999 it was expanded to include education and healthcare organizations, then later in 2006 the criteria were updated to include nonprofit and government organization. The name of the program have also changed in 2010 from Malcolm Baldrige National Quality Award to the Baldrige Performance Excellence Program (Link, 2011; NIST, 2011).

The Baldrige criteria are non-prescriptive, meaning that the criteria do not prescribe a specific structure or practice for management, they do not recommend certain tools or benchmarking, and they do not tell organizations which path their business should take. The criteria focus on results not on tools or procedures. They also focus on the approach, deployment, learning, and integration of processes. This encourages organization to develop their own innovative methods to meet the requirements of the criteria. The focus on the goal rather than the method foster communications, sharing, and integrations of ideas that results in innovative solutions. Specific solutions are avoided also to ensure that the program can help different types, sizes, and level of organization maturity (NIST, 2011).

Applicants are judged and assessed by external examiners in seven categories: Leadership, strategic planning, customers and market focus, measurements and knowledge management, human resource focus, process management, organization performance results (Garvin, 1991; Wisner & Eakins, 1994). The scoring system is based on a 1000 points scale and three-level judging process. The process starts when applicants submit the answers to the Baldrige self assessment survey questionnaires, a group of members of the board of examiners review and score the applicant response then pass the initial results to a panel of judges who

select the top applicants based on their scores, then a team of senior and professional examiners visit the selected applicants for further interviews and documents checking, the score will be updated based on the site visit outcome, then judges meet again for a final time to select winners (Garvin, 1991; Loomba & Johannessen, 1997).

Baldrige award is not a quick fix program; it is a journey of transformation that needs dedication and continuous involvement from senior management. From the time an organization perform the Baldrige self assessment check to understand and know it is current stand in term of performance excellence till it reaches a high class organization and win the Baldrige award there could be many years of work to cover the gap in the various areas assessed by the Baldrige criteria (Garvin, 1991; Hertz, 2012).

The Baldrige assessment for each process in the first six categories is based on four clear measures, Approach, Deployment, Learning, and Integration (ADLI). Each process measure is analyzed for strengths and weaknesses (opportunity for improvement). The ADLI measures ensure a horizontal and vertical deployment of every improvement process in the framework with high degree of alignment and harmony. The horizontal deployment shows whither the improvement program covers one area, couple of areas or all areas in the organization. The vertical deployment covers the tying of strategic goals established by senior management and lower activities done by line workers. Based on these four stages of improvement Baldrige board of examiners differentiates between organizations that have some performance improvement efforts and others that have fully matured improvement processes. Organizations with low score, usually 300 or less, have weakness in most Baldrige categories; they might have one or two good

projects or one Baldrige category where the company performs well, but lack proper deployment and integrations of improvement processes, and show no or few links between quality activities and strategic goals. Organizations with medium score, usually between 400 and 600, are strong in two or three categories and have more programs that are fully deployed and integrated with links between strategic goals and activities, these companies are usually strong in the leadership, human resources, and customer focus categories, but weak in information and knowledge management, results and strategic planning. Deployments outside the operation areas have issues with lower activities not linked to strategic goals. High scorers, usually over 700, have balanced outstanding performance across the organization, All Baldrige seven categories are rated excellent, Every quality and improvement activity in the organization is deployed and integrated well horizontally and vertically (Garvin, 1991; NIST, 2011).

MBNQA and organization performance

Baldrige award has been proofed to be an effective framework for improving organizations' performance and competitiveness, between 1997 and 2000, the index of the companies that received MBNQA outperformed Standard & Poor's 500 by 4.5:1 (Lee et al., 2003). Hospitals that won Baldrige award are six times more likely to be among the top 100 hospitals, they also outperform their top 100 peers in six out of seven key evaluated measures (Hertz, 2012). Studies show that Baldrige award winners perform as well or better than their competitors financially in the market (Wisner & Eakins, 1994). In 2010 Jerry Rose, Vice President, Cargill, Inc. Baldrige award winner, demonstrated the impact and return on investment of using Baldrige. He demonstrated the ROI of three different units in the company that have

different level of Baldrige deployment, the unit that has high Baldrige deployment showed 30% increase in cumulative earning after tax (EAT) compared to 13% for the unit that has partial Baldrige deployment, and -12% for the unit that just started the Baldrige program (Rose, 2010). A study was conducted on 2001 concluded that the US economic benefit from the program based on the benefit-to-cost ratio was 207 to 1. This ratio was updated in a new study using data from 273 applicants from 2006 till 2010 and different analysis, the benefit-to-cost ratio surged to reach 820 to 1 (Link, 2011).

MBNQA Critics & supporters

Despite the wide success, business people, journalists, and quality gurus have criticized the Baldrige award since the beginning of the program. Edward Deming said that Baldrige concentrate on results and not on actual quality management. Philip Crosby argued that organizations are not rewarded for becoming expert in quality, but for complying with Baldrige criteria (Loomba & Johannessen, 1997). Other criticisms were based on three main issues:

First, engagement in the Baldrige award program is costly; it requires major investment in time and money to go through the application and assessment process. Xerox spent $800,000 and a year long of 20 full time employees working hours to prepare for winning the Baldrige award in 1989. Small companies cannot afford to compete with such amount of money and resources needed to win the award (Garvin, 1991; Loomba & Johannessen, 1997).

Second, Baldrige does not reflect financial success, several Baldrige winners suffered financially after wining the award, including Motorola in 1988, Fedex in 1990, and Cadillac in

1990. Even worse, Wallace company Inc., winner of 1990, filed for bankruptcy less than two years after they had won the award (Garvin, 1991; Loomba & Johannessen, 1997).

Third, Baldrige award does not reflect superior product or high quality service. When Cadillac won the award in 1990, they ranked number eight in overall customer satisfaction for the same year by powers reports, consumer reports and J.Ds powers rated Cadillac as less than other stellar rated cars (Loomba & Johannessen, 1997).

Supporters of Baldrige award believe that most criticisms have no or limited merits, while some companies spent lots of time and money to win the award other companies did not spend much in return for winning such a prestigious award, Baldrige has different awards for big and small organizations so fairness is there, in the meantime, Baldrige helps organization on the long run and not for short term gains, profit is not guaranteed with wining Baldrige award, also the earlier criteria does not cover all aspect of financial success such as effective marketing, innovative R&D and financial planning (Garvin, 1991). Newer criteria however have innovation embedded within the different Baldrige categories (NIST, 2011). Defenders of Baldrige do admit that it is not perfect and that is why the criteria get reviewed and updated continuously. But, the adoption of the criteria by many countries around the world provides more evidence for the success of the program. The main value of the Baldrige program is having a road map and process that help organizations change to the better in terms of quality and performance. Dr. Juran supported Baldrige and he thought that critics misunderstood the main goal of the award, He said that "It's not, Meeting the criteria is the heroic effort" (Loomba & Johannessen, 1997).

Baldrige and Organization's Dynamic/innovation capabilities

In the 21st century, an organization not only need to do things right, but also need to do the right things in order to stay in competition. Quality and efficiency that is driven by the improvement programs such as Baldrige, TQM, Six Sigma, and ISO result in excellent mainstream (operational) capabilities, however, this might not be sufficient alone to sustain fierce competition and continuous changes. Organization must possess innovation (dynamic) capabilities to be able to innovate to sustain the competition. A radical innovative product introduced by a small company can pose a major threat to a leading company operating in the same market. At this time, Most CEOs want their organization to innovate and develop the required capabilities for that, however, this is not an easy task, introducing changes in the organization requires knowledge, patience and leadership along with a systematic framework that guide the organization to assess, build and sustain the changes.

Baldrige framework provides a vehicle for change, it helps organizations assess their current performance, also help management to plan, perform, and measure improvement activities and results. This leads to continuous enhancement in organization's products, services, and processes. It also helps organizations align their processes and resources to achieve the organizations goals. Baldrige performance excellence program is a complete transformation framework that is easy to understand and follow. The Baldrige program can be used to improve the operational/mainstream capabilities and Dynamic/new stream capabilities required to help organizations innovate to sustain their businesses and increase their competitive advantage.

Possible future work

Despite the increased interest in dynamic capabilities approach (David J Teece et al., 1997) in recent years, The concept is still not fully established in research literature (Ellonen et al., 2009). Critics suggest that the field of dynamic capabilities requires guidance for future research regarding construct, relationships, boundaries conditions, and contingencies (Barreto, 2010). Dynamic capabilities literature is still in early stages and future opportunities for further research lies in the links between individual, group managerial actions, dynamic capabilities, and firms performance (David J. Teece, 2012). Future research may consider the operationalization of a firm's dynamic capabilities as a simple sum of its four dimensions or multiplicative nonlinear function of these dimensions (Barreto, 2010). Future researches can utilize financial analysts in surveys to collect data for measuring dynamic capabilities constructs, this will mitigate firm's managers responses to such surveys (Barreto, 2010). Furthermore future research can continue address the relationship between dynamic capabilities and intermediate outcome, also between intermediate outcome and performance (Barreto, 2010). There is also a need to have studies that focus on dynamic capabilities and how they link to functional capabilities such as IT, R&D, and marketing. Furthermore, there is a need to explore the construct of dynamic capabilities in other context such as traditional industries, and other countries where different constraints and conditions apply (Easterby- Smith, Lyles, & Peteraf, 2009). Future research can consider how sensing, seizing, and reconfigurations of capabilities are manifested in different industries, Also the interrelationship between firm's capabilities and its innovations activities is a promising research area (Ellonen et al., 2009). Finally, despite the increase interest in

organizational and dynamic capabilities, there is little in-depth on how organizational capabilities for innovation are developed in practice (Börjesson & Elmquist, 2011).

From the Baldrige program literature, limited amount of scholarly research has been conducted using the Baldrige Criteria, Some scholars like Pannirselvam, Siferd, and Ruch (1998), Wilson and Collier (2000), Meyer and Collier (2001), and Flynn and Saladin (2001) focused on validating the Baldrige model using surveys and data from states' award programs. Other researches such as Evans (1997), Ford and Evans (2000), Jack and Evans (2003) Evans (2004) and Stephens, Evans, and Matthews (2005) studied the conceptual linkage among the elements of the criteria and the results items. However, very little studies have been conducted using Baldrige applicant data.

Conclusion

In conclusion, the literature review in a multidiscipline topic requires intensive research in many areas in order to have an established understanding of the status in the various bodies of knowledge. Even though, such study is overwhelming with information and requires huge amount of time and efforts, the link between multiple bodies of knowledge is innovative in itself.

According to literature, there is very little in-depth research on how organizational capabilities for innovation are developed in practice (Börjesson & Elmquist, 2011). In the Baldrige side, recent a study shows that limited amount of scholarly research has been performed using the Baldrige Criteria, also very little research has been performed using Baldrige applicant

data (Evans & Mai, 2014). The study argues that rigorous research on the impact and effectiveness of the Baldrige program is still nascent.

Up to this writing, there is no study that has addressed the impact of Baldrige Excellence Framework, utilizing applicants' data and scores, on organizations' innovation/dynamic capabilities.

CHAPTER THREE: METHODOLOGY

Introduction

This chapter describes the design and methods that will be used in this research and will outline and discuss the steps and rational behind the activities that will take place to measure and collect the required data to achieve the objective of this research study, which is to measure the effect and correlation between Baldrige (Sterling) framework on organizations innovations/dynamic capabilities.

Methodology

A quantitative method is being used in this research study to explain the effect and the correlation between organizations' performance excellence measured by Baldrige (Sterling) assessment score and their innovation/dynamic capabilities level. Two numerical data for each organization will be measured/collected, one that measures the level of organization's performance excellence represented by the Baldrige (Sterling) assessment framework, and one that measures the organization's innovation/dynamic capabilities using a survey tool.

This research will answer the following question and hypothesis to explain the relationship between Baldrige assessment framework and innovation/dynamic capabilities.

Main question: What is the effect of Baldrige (Sterling) assessment framework on Organization's innovation/dynamic capabilities?

Main Hypothesis: Baldrige assessment framework has a positive impact on Organization's innovation/dynamic capabilities.

To answer the research main question, further sub-questions and hypothesises have been developed, each sub-question addresses one of six areas that represent a foundation block for organization's innovation capabilities (figure 2.0).

Sub-question 1: What is the effect of Baldrige assessment framework on Organization's value for innovation?

Hypothesis, H1: Baldrige assessment framework has a positive impact on Organization's value for innovation.

Sub-question 2: What is the effect of Baldrige assessment framework on Organization's behaviour regarding innovation?

Hypothesis, H2: Baldrige assessment framework has a positive impact on Organization's behaviour regarding innovation.

Sub-question 3: What is the effect of Baldrige assessment framework on Organization's innovation culture?

Hypothesis, H3: Baldrige assessment framework has a positive impact on Organization's innovation culture.

Sub-question 4: What is the effect of Baldrige assessment framework on Organization's innovation's resources?

Hypothesis, H4: Baldrige assessment framework has a positive impact on Organization's innovation's resources.

Sub-question 5: What is the effect of Baldrige assessment framework on Organization's innovation's processes?

Hypothesis, H5: Baldrige assessment framework has a positive impact on Organization's innovation processes.

Sub-question 6: What is the effect of Baldrige assessment framework on Organization's innovation measurement?

Hypothesis, H6: Baldrige assessment framework has a positive impact on Organization's innovation's measurement.

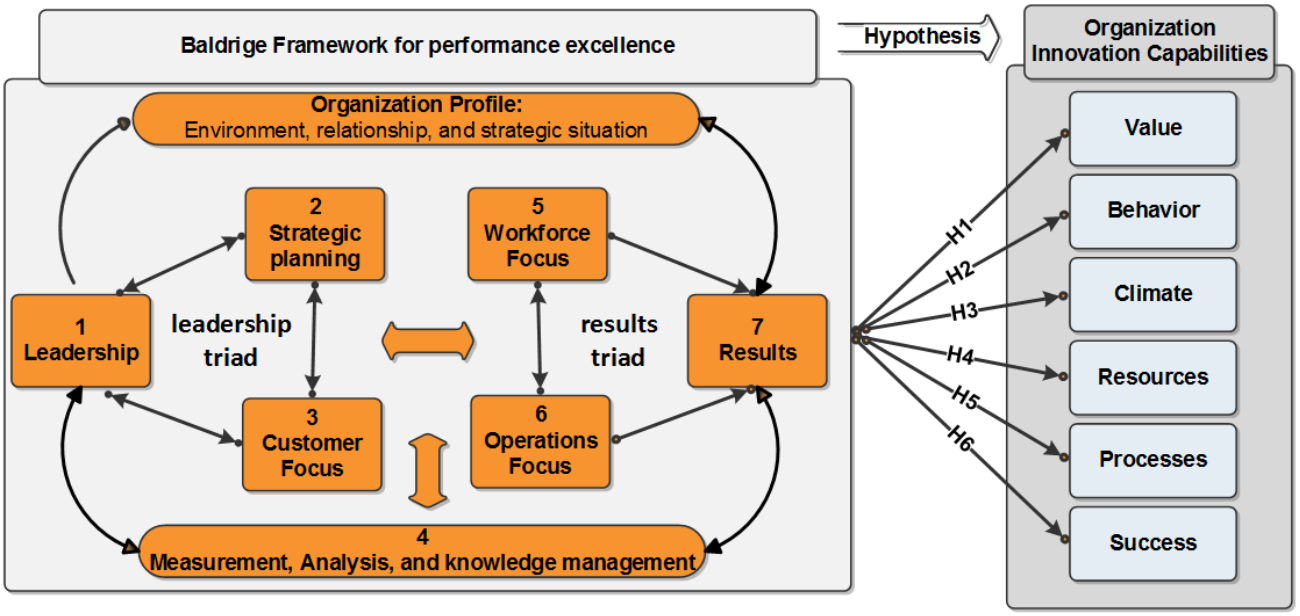

Figure 3: Research Model

Participants

In this research study, a total of 24 organizations participated in the study. The participating organizations represent different industries; healthcare; education; private and government. All the participating organizations are located in Florida State since Florida Sterling council conducts Baldrige framework assessment on local organizations only.

The organizations selection was coordinated with Florida Sterling council who is supporting this research by providing the assessment reports for the participating organizations and communicating with organizations' leaders to invite/encourage them to participate in the study.

The innovation survey (appendix A) will be assessed at three different levels of organization hierarchy; top management, middle management, and employees in order to have a broad and 360 feedback from across the organization.

Instruments

This research employed two different instruments to measure organizations' performance excellence and innovation capabilities. Baldrige framework (Sterling assessment) was used to measure organization's performance excellence, and a comprehensive survey was used to measure organization's innovation capabilities.

Baldrige Framework (Sterling Assessment)

Florida Sterling has three main assessment programs ; Challenge, GSA, and Sustained. The Sterling Challenge is designed for organizations that are in the early stages of developing a system wide approach to improve their processes, It's the first step towards GSA and Sustained programs.

The Sterling Challenge consist of an organization profile and a 20 pages answers to a simplified and direct questionnaires on the seven areas of management practices: Leadership, Strategic Planning, Customer Focus, Measurement, Analysis and Knowledge management, Workforce Focus, Operations Focus and Results. During the five days site visit, a team of experts between 5-6 members interview employees at all levels of the organization.

The Sterling GSA is designed for mature organizations with systematic processes and positive results. The GSA assessment program is rigorous and consisting of organization profile and a 50 pages response to a detailed questionnaires. GSA is conducted over an extensive seven days site visit. A detailed feedback report at the item level is provided that identifies strength, opportunities and overall organization theme.

The Sterling Sustained is designed to help GSA recipients retain their role model status as a top performing organizations. The sustained program is a high-level assessment process that examines the long-term sustainability of the Baldrige management framework. A formal off-site and on-site assessment is conducted by a team of experienced examiners to verify and clarify current organization performance through interviewing leaders and professionals in the organization.

Innovation Survey

A comprehensive Innovation survey (appendix A) has been used in this research to measure organizations' innovation/dynamic capabilities. The survey is designed with fixed response items based on a 5-point rating scale question. The survey questionnaires consist of six building blocks: innovation Value, innovation behaviour, innovation culture, innovation resources, innovation

processes, and innovation success measurement. Each building block addresses three factors, and each factor consists of three elements. This yields a total of 54 questions in the survey. The six building blocks of organization innovation capabilities reviewed in details as part of the literature review and summarised as follow:

- **Block 1 - Innovation value:** The ability to value innovation across the organization through:
    - Instituting an entrepreneurial mindset that is action-oriented, has a hunger for exploring new opportunities, and has tolerance for ambiguity.
    - Institute creativity through encouraging new ways of thinking, providing freedom to pursue new opportunities, and creating playful space.
    - Institute learning habit through asking questions to uncover the unknowns, experimenting new things, and treating failures as learning opportunities.
- **Block 2 – Innovation behavior:** The ability to show the right behavior by leaders and employees in the organization to reflect the value put on innovation in practice. This can be done through:
    - Energize the organization by inspiring the employees with future vision, challenge the employees to act innovatively, and show the right innovation model for employees to follow.
    - Engage the employees through coaching and supporting their innovative initiatives.

- Enabling innovation in the organization through use of strategies to overcome obstacles, change course of action when needed, and follow opportunities persistently.

- **Block 3 – Innovation Culture:** The ability to transform the organization culture to one that cultivates and encourage creativity and innovation. This can be done through:
  - Create a collaboration climate in the organization through encouraging teamwork, respecting diversity, having common understanding of innovation.
  - Create a safe environment in the organization that encourages employees to voice their opinions and question decisions that are inconsistent with the organization values.
  - Create a simple workplace environment that minimize bureaucracy, discourage finger pointing and encourage taking responsibilities.
- **Block 4 – Innovation Resources:** The ability to provide and mobilize the required resources to support innovation within the organization, resourcing includes:
  - People: Are the most critical factors in resources especially champions who impact organizations values and culture, experts who guide others with innovation tools, and talents who ensure projects success.
  - Systems: that hires the right people for supporting innovation culture in the organization, provides a collaboration tools to support innovation efforts, and leverage relationships with suppliers and partners to pursue innovation opportunities.

- Projects: providing employees with time, money, and space to pursue new opportunities.

- **Block 5 – Innovation processes:** The ability to develop the required processes that funnel creative ideas through different stages till it become fully commercialized. This requires:
  - Ideation: a process that allows generation and collection of ideas from different sources, screen the generated ideas for promising ones, and balance risk versus opportunities.
  - Shape: through prototyping promising opportunity, customers' feedback, and quick failing based on predefined criteria.
  - Capture: through flexible process that takes promising opportunity quickly to the market and allocates resources to scale initiatives that shows market promise.
- **Block 6 – Innovation Success Measurement:** The ability to measure innovation efforts at different levels:
  - External: measuring organization's innovation with customers, against competitors, and through organization's financial performance.
  - Enterprise: assessing the organization new capabilities over the past three years, long term vision and approach to innovation.
  - Individual: measuring employees' satisfaction, growth, and reward in regard to innovation efforts and initiatives.

Measurement scale

The two measurement instruments use different scale to assess their related measurements:

Baldrige Framework (Sterling Assessment)

Baldrige Framework (Sterling Assessment) measurement scale is based on two evaluation dimensions: process and results. The processes criteria follow a scoring scale (Table 1) that is different from the result criterion scoring scale (Table 2). Process refers to the way organizations perform and improve works in Leadership, Strategic planning, Customer Focus, Measurement, Analysis and Knowledge management, Workforce Focus, Operation Focus. The processes are evaluated based on four factors; Approach, Deployment, Learning and Integration (ADLI). Approach refers to the method used to accomplish the process and how appropriate and effective these methods are, Deployment refers the extent and consistency of used approaches across the organization, Learning refers to the improvement conducted on these approaches and sharing of best practices and Integration refers to the alignment of these approaches with the organization goals and needs. Results refer to the output of the organization processes in the six areas mentioned above. Four factors are used to evaluate results; Levels, trends, Comparisons, and integration (LeTCI). Level refers the current level of performance. Trends refer to results over extended time or the slope of the results. Comparisons refer to the organization performance in relation to competitors and industry leaders. Integration refers to how relative the results to the organization profile key factors.

Baldrige (Sterling) assessment program uses a scale of 1000 points to measure the organization performance excellence. These points are distributed on the seven management areas, Table 1 Measurement scale, Shows the breakdown of the points over the seven management areas.

Table 1: Sterling Measurement scale

#	Management Area	Score
1	Leadership	140
2	Strategic Planning	100
3	Customer Focus	100
4	Measurement, Analysis & Knowledge Management	100
5	Workforce Focus	100
6	Operations Focus	100
7	Results	360

Innovation Survey

The organizations' innovation/dynamic capabilities will assess 6 building blocks that covers; innovation Value, innovation behaviour, innovation culture, innovation resources, innovation processes, and innovation success measurement. Each building block is divided into three factors and each factor includes three elements. East elements is rated based on a 5 points Likert Scale:

1. 1 = Strongly disagree
2. 2 =mildly disagree
3. 3 =neutral
4. 4 =mildly agree

5. 5 = strongly agree

Block	Factor	Element	Score 1-5	Factor Ave.	Block Ave.
Values	Entrepreneurship	Hunger			
		Ambiguity			
		Action Orientated			
	Creativity	Imagination			
		Autonomy			
		Playful			
	Learning	Curiosity			
		Experiment			
		Failure			
Behaviors	Energy	Inspire			
		Challenge			
		Model			
	Engagement	Coach			
		Initiative			
		Support			
	Enablement	Influence			
		Adapt			
		Grit			
Climate	Collaboration	Community			
		Diversity			
		Teamwork			
	Safety	Trust			
		Integrity			
		Openness			
	Simplicity	No Bureaucracy			
		Accountability			
		Decision Making			
Resources	Talent	Champions			
		Experts			
		Talent			
	Systems	Selection			
		Communication			
		Ecosystem			
	Programs	Time			
		Money			
		Space			
Processes	Ideation	Generate			
		Filter			
		Priorities			
	Testing	Prototype			
		Iterate			
		Fail Smart			
	Speed	Flexibility			
		Launch			
		Scale			
Success	External	Customers			
		Competitors			
		Financial			
	Organizational	Purpose			
		Discipline			
		Capabilities			
	Individual	Satisfaction			
		Growth			
		Reward			
Organization innovation score (Average of the six Block scores)					

Table 2: Innovation Capabilities score

Elements will be averaged to obtain the factor score, and factors will be averaged to calculate the block score, the average of the six building blocks reflect the overall organization innovation capabilities score.

Table 3: Process criteria measurement scale

Factor	0–5%	10–25%	30–45%	50–65%	70–85%	90–100%
Approach	No **systematic approach** to Item requirements is evident; information is **anecdotal.**	The beginning of a **systematic approach** to the **basic requirements** of the Item is evident.	An **effective, systematic approach,** responsive to the **basic requirements** of the Item, is evident.	An **effective, systematic approach**, responsive to the **overall requirements** of the Item, is evident.	An **effective, systematic approach,** responsive to the **multiple requirements** of the Item, is evident.	An **effective, systematic approach**, fully responsive to the **multiple requirements** of the Item, is evident.
Deployment	Little or no **deployment** of any **systematic approach** is evident.	The **approach** is in the early stages of **deployment** in most areas or work units, inhibiting progress in achieving **the basic requirements** of the Item.	The **approach** is **deployed**, although some areas or work units are in the early stages of **deployment**.	The **approach** is well **deployed**, although **deployment** may vary in some areas or work units.	The approach is well deployed, with no significant gaps.	The **approach** is fully **deployed** without significant weaknesses or gaps in any areas or work units.
Learning	An improvement orientation is not evident; improvement is achieved through reacting to problems.	Early stages of a transition from reacting to problems to a general improvement orientation are evident.	The beginning of a **systematic approach** to evaluation and improvement of **key processes** is evident.	A fact-based, **systematic** evaluation and improvement process and some organizational **learning**, including **innovation,** are in place for improving the efficiency and **effectiveness** of **key processes**.	Fact-based, systematic evaluation and improvement and organizational learning, including innovation, are key management tools; there is clear evidence of refinement as a result of organizational-level analysis and sharing.	Fact-based, **systematic** evaluation and improvement and organizational **learning** through innovation are **key** organization-wide tools; refinement and **innovation**, backed by **analysis** and sharing, are evident throughout the organization.
Integration	No organizational **alignment** is evident; individual areas or work units operate independently.	The **approach** is **aligned** with other areas or work units largely through joint problem solving.	The **approach** is in the early stages of **alignment** with basic organizational needs identified in response to the Organizational Profile and other Process Items.	The **approach** is **aligned** with overall organizational needs identified in response to the Organizational Profile and other Process Items.	The **approach** is **integrated** with current and future organizational needs identified in response to the Organizational Profile and other Process Items.	The **approach** is well **integrated** with current and future organizational needs identified in response to the Organizational Profile and other Process Items.

Table 4: Results criteria measurement scale

Factor	0–5%	10–25%	30–45%	50–65%	70–85%	90–100%
Levels	There are no organizational **performance results** and/or poor **results** in areas reported.	A few organizational **performance results** are reported, responsive to the basic requirements of the item, and early good **performance levels** are evident.	Good organizational **performance levels** are reported, responsive to the **basic requirements** of the item.	Good organizational **performance levels** are reported, responsive to the **overall requirements** of the item.	Good to excellent organizational **performance levels** are reported, responsive to the **multiple requirements** of the item.	Excellent organizational **performance levels** are reported that are fully responsive to **the multiple requirements** of the item.
Trends	**Trend** data either are not reported or show mainly adverse **trends.**	Some **trend** data are reported, with some adverse **trends** evident.	Some **trend** data are reported, and a majority of the **trends** presented are beneficial.	Beneficial **trends** are evident in areas of importance to the accomplishment of the organization's **mission.**	Beneficial **trends** have been sustained over time in most areas of importance to the accomplishment of the organization's **mission**.	Beneficial **trends** have been sustained over time in all areas of importance to the accomplishment of the organization's **mission.**
Comparisons	Comparative information is not reported.	Little or no comparative information is reported.	Early stages of obtaining comparative information are evident.	Some current **performance levels** have been evaluated against relevant comparisons and/or **benchmarks** and show areas of good relative **performance**.	Many to most **trends** and current **performance levels** have been evaluated against relevant comparisons and/or **benchmarks** and show areas of leadership and very good relative **performance.**	Evidence of industry and **benchmark** leadership is demonstrated in many areas.
Integration	**Results** are not reported for any areas of importance to the accomplishment of the organization's **mission.**	**Results** are reported for a few areas of importance to the accomplishment of the organization's **mission.**	**Results** are reported for many areas of importance to the accomplishment of the organization's **mission.**	Organizational **performance results** are reported for most **key customer**, market, and **process** requirements.	Organizational **performance results** are reported for most **key customer**, market, **process**, and **action plan** requirements.	Organizational **performance results** and **projections** are reported for more **key customer**, market, **process**, and **action plan** requirements.

Quality and validity of tools:

Reliability and validity of the used instrument are crucial to ensure quality of the measurement. Reliability deals with the stability and consistency of the measure instruments. There are four types of reliability test for a measurement instrument; Test-retest reliability, parallel form reliability, inter-rater reliability, and internal consistency reliability. Validity refers to the extent an instrument measures what it is purported to measure. Validity is measured in four forms; face validity, content validity, criterion validity, and construct validity.

In this research, Organization's innovation/dynamic capabilities are measured using an established instrument, survey questionnaires that have been field-tested for over two years for statistical validity and executive acceptance as both a diagnostic and actionable tool. Data was gathered from 1,026 executives and managers in 15 companies headquartered in the U.S., Europe, Latin America and Asia. Confirmatory factor analysis revealed that 16 out of the 18 factors were reliable at 0.7 or above; the other two were above 0.6. A complete item analysis showed that item discrimination was 0.3 and above (Rao & Weintraub, 2013).

The organization performance excellence assessment follows the Baldrige framework for assessment, which is a standard methodology that is being use in the US and other countries across the world to assess and improve organizations performance. The assessment process goes through ten steps:

1) Organization training: where Florida Sterling trains potential organizations on the performance excellence framework and assessment criteria.

2) Organization profile: the organization develops a complete profile that reflects the organizations products, services, customer, partners, workforce profile. The organization also provides current and future strategy, goals and objectives, competitive challenges and advantages.

3) Criteria response: The organization responds to the assessment criteria based ADLI (Approach, Deploy, Learning, and Integration) process. Which means that every criteria response has to show consistent approach across the organization, it also has to be deployed and used throughout the organization, there must be learning in the process, and it has to show integration with whole system. The criteria response usually takes between 10 to 50 pages.

4) Examiners training: Florida sterling trains the examiners on the assessment process and this takes three training classes in addition to completing a case assessment.

5) Examiner Team: Sterling organization forms the examining team based on the domain of knowledge and industry of the organization operate in. usually six to nine examiners are assigned the assessed organization.

6) Individual evaluation: first actual assessment step is done individually by all examiners, where each examiner review the organization responses to all criteria and complete an independent evaluation.

7) Team consensus: where the examining team meet for a full day to review all independent assessments and come with a consensus result.

8) Site visit: the team arrange for a five to seven days site visit during which, the examiners meet with staff from the organization and conduct an interview with leaders, managers, and staff working in the organization. The consensus assessment gets updated based on the site visit collected information.

9) Finalize assessment report: The team finalize the assessment report and sent it to Florida Sterling.

10) Feedback: Florida Sterling reviews the report and develop an official feedback report to the applicant in case of Challenge program. If the organization is participating in a GSA or Sustained program, the final assessment report is sent to judges to review and select performance winners.

The process for assessing organizations performance is rigorous and takes from two to six months to complete based on the size and type or assessment. To ensure that the data from the performance excellence does not interfere or affect the data from innovation capability measure, Both assessment have been done separately with at least two months difference and through different medium. The Baldrige assessment is mainly face to face with on-site and off-site assessment; Innovation assessment is an online survey.

Analysis

Once the data are collected, each organization will have two data records, one that measures the organization performance excellence in term of leadership, strategic planning, customer focus, workforce focus, knowledge management, operation, and results, these performance scores are aggregated to establish the overall organization performance excellence score out of 1000 points.

The other data measure represents the organization innovation capability in terms of innovation value, innovation behaviour, innovation culture, innovation resources, innovation process, and innovation measurement; these innovations scores are aggregated to establish an organization innovation capability score out of 5 points.

First step, validate the three different Baldrige (Sterling) performance excellence assessment programs and their effect on organizations' overall performance. Using ANOVA, we analyse the difference of performance means among the three assessment programs; Challenge, GSA, and sustained. This will show that the different assessment programs do reflect different performance excellence levels that we will be using to measure their effects on organizations innovations' capabilities.

Second step, Regression analysis will be used to test the six hypothesises to measure the relationship between Baldrige assessment framework and each of the six measured innovation blocks. This will show the effect of Baldrige (Sterling) management framework on each innovation building block.

Third step, Regression analysis will be used to test the main hypothesis to measure the relationship between Baldrige assessment framework and overall organization's innovation capability score.

Phased Timeline

The following is a phased approach (Figure 2.0) with check gate at the end of every phase for time and process control. The dissertation project has 5 phases with 10 steps that cover the research study from initial concept to discussion and recommendation.

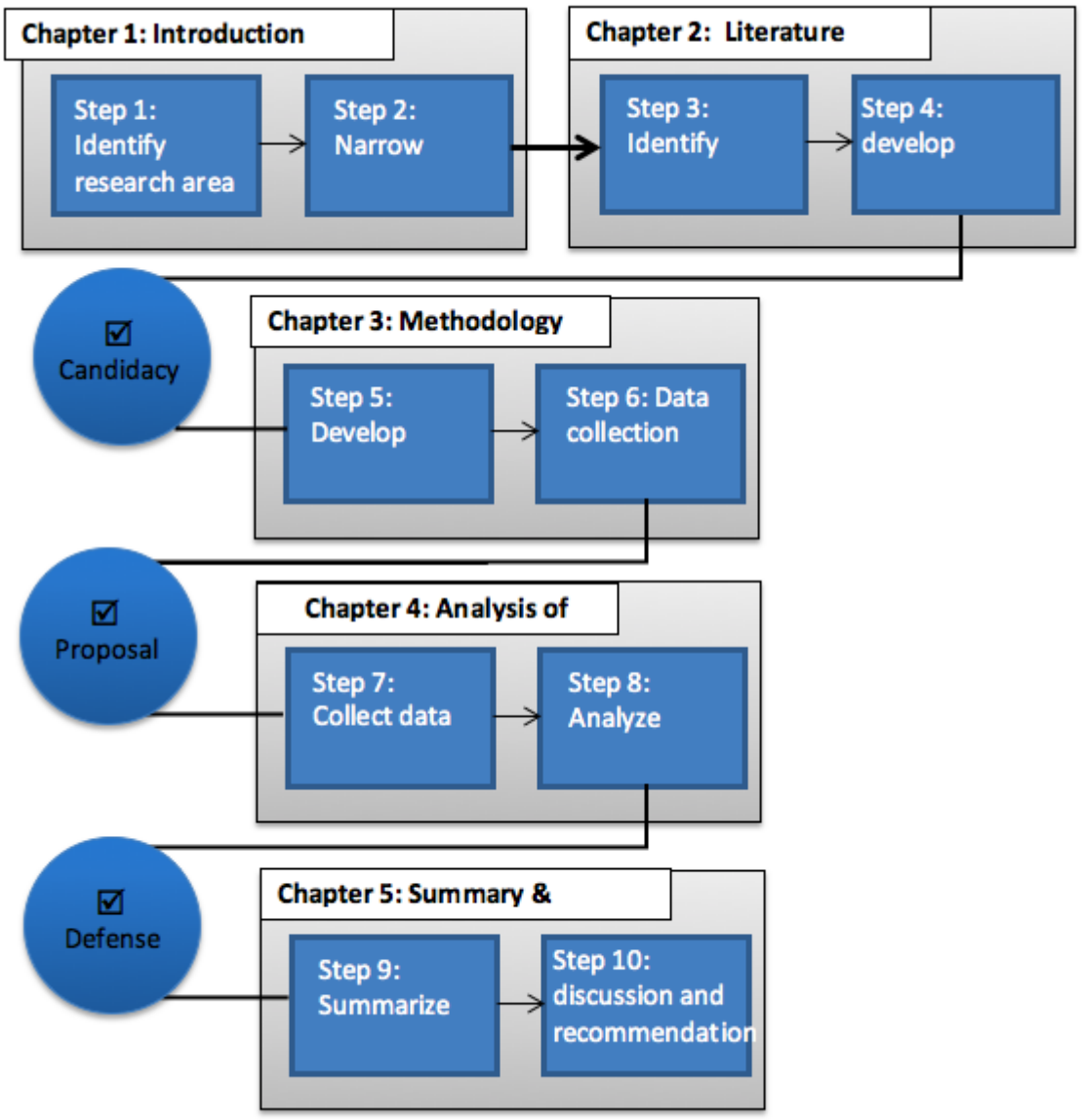

Figure 4: Phased timeline

Detailed timeline

Table 5: Detailed timeline

Research step	Expected completion date	Status
Step 1 – Identify research area and topic	JAN. 2013	✓
Step 2 – Narrow topic focus	FEB. 2013	✓
Step 3 – Identify research gap	MAR. 2013	✓
Step 4 – Develop research question	APR. 2013	✓
Gate A – Candidacy exam	MAY 2013	✓
Step 5 – Develop hypothesis	NOV. 2013	✓
Step 6 – Data collection plan	DEC. 2013	✓
Gate B – Proposal	APR. 2014	✓
Step 7 - Collect performance & innovation data	NOV. 2014	✓
Gate C – Data Collection complete	DEC. 2014	✓

Step 8 – Analyze data	FEB. 2015	✓
Step 9 – Summarize findings	APR. 2015	✓
Step 10 – Discussion and recommendation	AUG. 2015	✓
Gate 11 – Journal paper 1	DEC. 2015	✓
Gate D – Defense	JAN. 2016	
Gate 11 – Journal paper 2	JAN. 2016	
Step 12 – update document	FEB. 2016	
Gate E – Graduate	MAY. 2016	

Limitations

The research study has the following limitations:

1. Since the study is being conducted with Florida Sterling Council, all participating organizations are from Florida, which cover businesses in one-state and not nation wide or international organizations. However, these organizations are benchmarking with top performing organizations operating in the same industry across the US. Which might reflect a national perspective to this study.
2. Due to the limited number of participating organizations in Florida Sterling Council assessment programs, this study will be conducted with twenty-four organizations from different industries, such as; healthcare, education, manufacturing, private and government. This sample mix might yield some inconsistency in the collected data, as different industries might have different innovation levels.
3. The twenty-four organizations participated in this study went through Florida Sterling Council performance excellence programs over the past 5 years, so some of these organizations specially the ones that did the assessment in 2010 might not had strong focus on innovation due to limited innovation criteria at that year criteria version. Also the newer organizations that participate in 2014 might not have enough time to realise the effect of

the program in their innovation capabilities. So all these variations in time and criteria version used among the participating organizations might produce different data. However, Florida Sterling Council keep updating participating organizations with newer criteria every two years and also invite and encourage those organizations to continue their journey to higher level of performance excellence through providing different assessment programs. Which might help the organizations continue focus on improving their operational and dynamic capabilities.

4. Another limitation in might have been in the innovation survey, eleven of the twenty-four organizations responded to the innovation survey, a response rate of 45.8%. Senior examiners in mature organizations completed the innovation survey. However, new organizations with no experienced examiners had their employees completed the survey. This might have inconsistent feedback, however to control this, a large number of participants were required from new organizations in order to accept their data.

5. Finally, Performance excellence data were collected through examiners. No clear data is available to examine the effect of examiners levels in the scoring process. Examiners' experience might have influenced the data. However, Florida sterling intensive examiners training, careful examiners selections based on the examiners performance during training and participation of senior examiners during the site visit and final scores suggest that reliability of the collected data is not an issue.

CHAPTER FOUR: FINDINGS

Introduction

The objective of chapter four is to present the findings that have been collected as part of this research study, which measures the effect of Baldrige (Florida Sterling) performance excellence framework on organizations' innovations capabilities. This is a quantitative correlation study that is trying to measure the correlation between performance excellence and the organization's innovation capabilities. Findings will be presented based on the significance of the tested hypothesis. The data demographics will be presented in this chapter, where type, specifications and age of collected data are discussed.

Data demographics

The target population in this research is consisted of any organizations of any size from private, government, education, manufacturing and healthcare sectors that have participated in one of Florida Sterling performance excellence programs. This research is focusing on three main performance excellence assessment programs; Sterling challenge, Governor Sterling Award (GSA), or Sterling Sustained Award. All organizations are located in the state of Florida, in the US. However, these organizations are benchmarking with top performing organizations operating in the same industry across the US. Which reflects a national perspective to this study. The data were collected from organizations that have been assessed through Sterling programs over the past five years (2010-2014). Some of these organizations have been assessed multiple times before 2010 and showed improvement in their performance excellence over the years; others are being assessed for the first time. New organizations usually start their performance

excellence journey with the challenge program and move on to utilize other assessment programs as they work on improving current processes and results.

Organizations Performance excellence data

The sampled organizations represent a wide range of performance output on the scale of performance excellence (100-1000) points. Starting from low performing organizations that score low in the Sterling challenge assessment program, Which is used by most organization in their early stages of performance excellence journey, to high performing organizations that score high on the same scale in the Sterling sustained program, which is used by organizations that have spent years in improvement and went through the detailed assessment program represented by the Governor Sterling Award (GSA) program.

The performance excellence data are extracted and summarized from each organization final performance assessment report. Performance assessment reports vary in length from one assessment type to another. For example, the challenge report assessment averages at twenty pages. The Governor Sterling Award assessment report, which is the most detailed one, averages at sixty pages. The Sterling Sustained assessment report averages at sixteen pages.

A typical assessment report reflects a detailed measurement in the Baldrige seven management areas (Leadership, Strategic planning, Customer focus, Measurement and knowledge management, Workforce focus, Operation focus and results). A detailed data of the collected results are listed in Appendix D (performance excellence data). In this study, the detailed data have been aggregated to calculate the process performance score and the results score for each organization. The process performance has a maximum score of 640 points and

the results score has a maximum score of 360 points. Once the process and result scores are obtained, both numbers are added to come up with the organization overall performance excellence score out of 1000 points. Table 6.0 (Performance excellence scores) shows the performance excellence scores of the twenty-four participated organizations.

Table 6: Performance excellence scores

Number	Year	Organization Code	Assessment Type	Process score	Result score	Performance score
1	2013	SIC109	Challenge	248	63	311
2	2011	SIC124	Challenge	200	135	335
3	2014	SIC114	Challenge	288	63	351
4	2011	SIC123	Challenge	240	135	375
5	2012	SIC125	Challenge	348	63	411
6	2013	SIC117	Challenge	308	135	443
7	2014	SIC126	Challenge	368	207	575
8	2014	SIC120	Challenge	456	207	663
9	2014	SIC116	GSA	416	149	565
10	2011	SIC121	GSA	436	178	614
11	2014	SIC108	GSA	416	207	623
12	2011	SIC111	GSA	442	193	635
13	2014	SIC118	GSA	456	207	663
14	2012	SIC103	GSA	452	221	673
15	2014	SIC107	GSA	466	250	716
16	2012	SIC112	GSA	488	250	738
17	2013	SIC110	GSA	507	250	757
18	2011	SIC115	GSA	529	243	772
19	2012	SIC127	Sustained	451	241	692
20	2011	SIC104	Sustained	528	223	751
21	2014	SIC102	Sustained	499	264	763
22	2011	SIC122	Sustained	538	241	779
23	2013	SIC101	Sustained	518	264	782
24	2011	SIC106	Sustained	538	253	791

The collected data reflects the three different assessment programs; eight organizations participated in Sterling challenge assessment program, ten organizations participated in Sterling

GSA program, and six organizations participated in the Sterling Sustained program. The collected results from the three different assessment programs have been tested using ANOVA to assess the different performance levels as result of participating in different performance excellence programs and maturity of the organization (Table 7: Different assessment programs data).

Table 7: Different assessment programs data

# Of Organization	Assessment scores per program		
	Challenge	GSA	Sustained
1	311	565	692
2	335	614	751
3	351	623	763
4	375	635	779
5	411	663	782
6	443	673	791
7	575	716	
8	663	738	
9		757	
10		772	

The ANOVA results a statistical difference among the three different performance excellence programs, which means at least one group has a different mean of performance excellence score. Table 8 (ANOVA-Challenge, GSA, Sustain) shows the outcome of the ANOVA analysis.

Table 8: ANOVA-Challenge, GSA, Sustain

Method	**One way ANOVA**				
Null hypothesis	All means are equal				
Alternative hypothesis	At least one mean is different				
Significance level	α = 0.05				
Equal variances were assumed for the analysis.					
Factor Information					
Factor	**Levels**	**Values**			
Assessment Type	3	Challenge, GSA, Sustained			
Analysis of Variance					
Source	**DF**	**Adj SS**	**Adj MS**	**F-Value**	**P-Value**
Code	2	453727.058	226863.529	33.83	<0.0001
Error	21	140821.9	6705.805		
Total	23	594548.958			

Further test has been conducted to confirm statistical differences between each two programs to confirm that as the organization continue with the performance excellence journey and go through the different level of performance excellence programs, the organization will improve its performance and eventually sustain the results on the long run.

Using Tukey method for multiple comparisons to compare each pair of groups (Table 9: Tukey method to compare pairs of means) confirmed a statistical difference in mean performance excellence score between Challenge assessment programs and GSA assessments, Also between Challenge and Sustained assessment program. However, there is no statistical difference in the mean performance excellence score between GSA and Sustained assessment programs.

Table 9: Tukey method to compare pairs of groups

Grouping Information Using the Tukey Method and 95% Confidence

Assessment Type	N	Mean	Grouping	
Sustained	6	759.5	A	
GSA	10	675.6	A	
Challenge	8	424.0		B

Means that do not share a letter are significantly different.

Tukey Simultaneous Tests for Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adjusted P-Value
GSA-Challenge	251.60	38.84	(153.82, 349.38)	6.48	<0.0001
Sustained-Challenge	335.50	44.23	(224.17, 446.83)	7.59	<0.0001
Sustained-GSA	83.90	42.29	(-22.55, 190.35)	1.98	0.1409

Individual confidence level = 98.00%

Tukey method with 95% CIs shows the differences between pair of assessment groups (Figure 5: Tukey 95% CI difference of means for performance score). Any test does not include zero represent a statistical difference. In this case, both GSA and Sustained programs have a statistical difference that Challenge; however, there is no statistical difference between GSA and Sustained assessment programs.

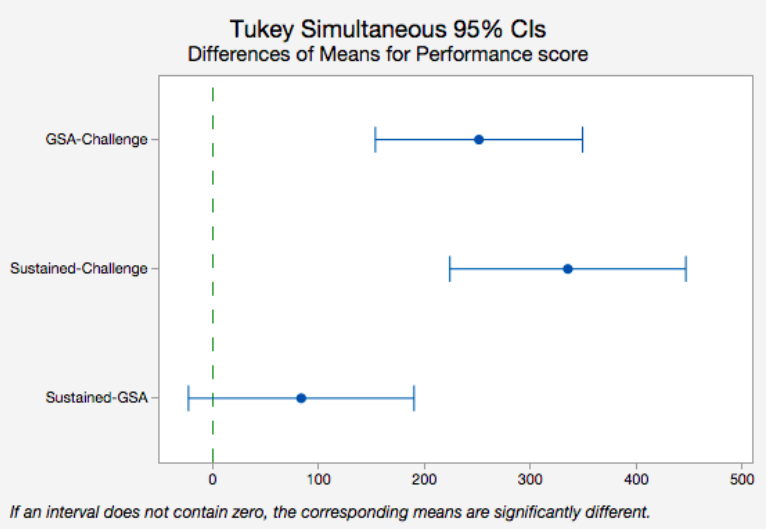

Figure 5: Tukey 95% CI difference of means for performance score

Using Dunnett Method and 95% confidence to test the difference of assessment means in comparison using Challenge assessment as a control group. Table: 10 (Dunnett method test using Challenge assessment as a control group).

Table 10: Dunnett method test using Challenge assessment as a control group

Grouping Information Using the Dunnett Method and 95% Confidence					
Assessment type	N	Mean	Grouping		
Challenge (control)	8	424	A		
Sustained	6	759.5			
GSA	10	675.6			
Means not labeled with the letter A are significantly different from the control level mean.					
Dunnett Simultaneous Tests for Level Mean - Control Mean					
Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adj. P-Value
GSA-Challenge	251.6	38.84	(159.46, 343.74)	6.48	<0.0001
Sustained-Challenge	335.5	44.23	(230.60, 440.40)	7.59	<0.0001
Individual confidence level = 97.27%					

Figure:6 (Dunnett method test using Challenge assessment as a control group) below provide a visual representation of the Dunnett test, where Challenge is the control group. Any test does not include zero represent a statistical difference, which means that both tests shows that GSA and Sustained assessment programs.

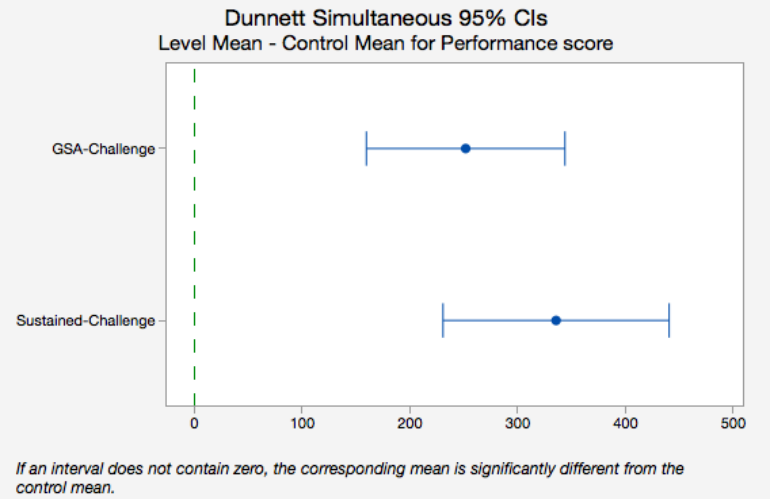

Figure 6: Dunnett method test using Challenge assessment as a control group

Note that Challenge assessment program is available to all organizations new to Baldrige performance excellence model. Usually organizations use this Challenge assessment as a baseline to get to know their weaknesses and strengths in order to start the journey of performance excellence. So this group is an ideal for a control group that we could use to measure the effect of Baldrige performance excellence model on organization performance improvement.

The model summary in Table 11 below shows how well the model fits the data. S represents the standard deviation of how far the data values fall from the fitted values, the lower the S the better, here S is equal to 81.88. R^2 measures the percentage of variation in the response that is explained by the model, the higher R^2 the better, R^2 equal to 76.3%

Table 11: Model summary

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
81.8889783	76.31%	74.06%	69.42%

Means

Assessment Type	N	Mean	StDev	95% CI
Challenge	8	424.00	114.84	(363.79, 484.21)
GSA	10	675.60	68.36	(621.75, 729.45)
Sustained	6	759.50	35.94	(689.98, 829.02)

Pooled StDev = 81.8889783

Normality test was conducted on the collected data to check the normal distribution of the data (Figure 7: Normality test). The normal probability plot of the residuals should approximately follow a straight line to satisfy the normality assumption in order for the test result is reliable. Twenty-four data were collected and based on the normality chart below; we could say that the collected data show normal distribution with a clear outlier in point # 8. This data was collected from SIC120 and it was flagged for further investigation once innovation data is collected.

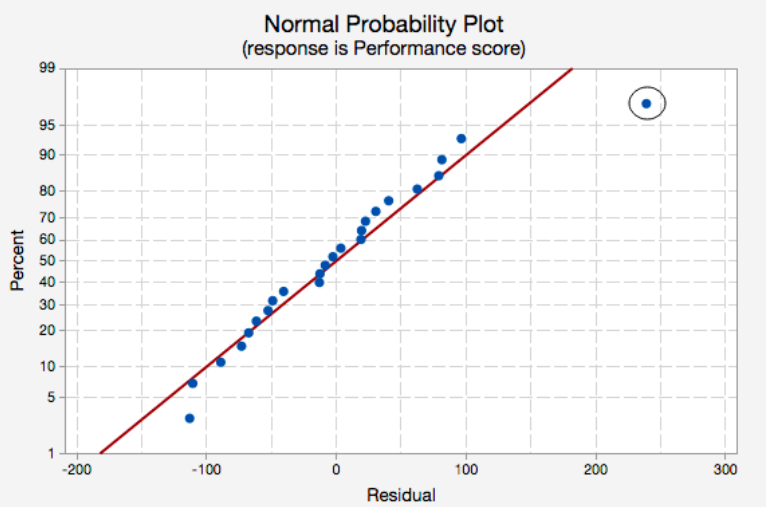

Figure 7: Normality test

One of the main assumptions in this research is that by implementing the different levels of Florida Sterling performance excellence assessment programs, Organizations improve their processes and overall performance over time. This assumption was confirmed during this study. As per the ANOVA test, Figure 8 (Performance score per program) shows that organizations that went through the GSA and Sustained assessment programs have higher performance excellence scores than the ones that went through Challenge assessment program.

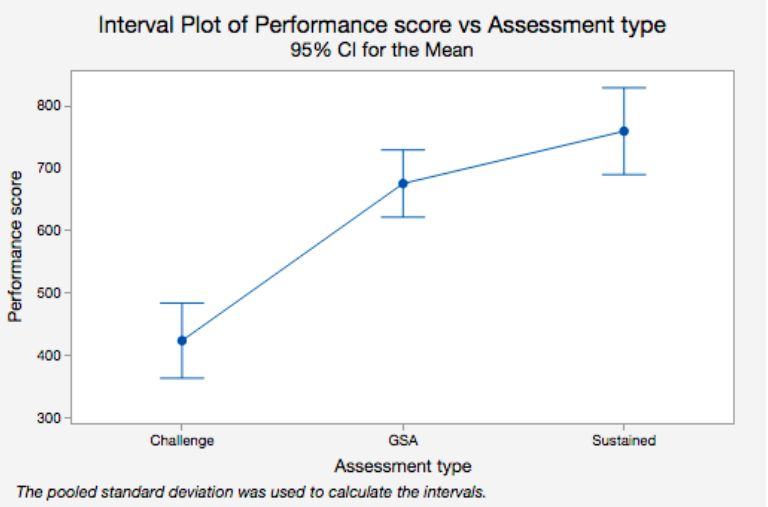

Figure 8: Performance score per program

Looking into the individual value plot diagram (figure 9: individual value plot of performance score vs. assessment type), We see that point # 8, which was collected from SIC120, is an outlier.

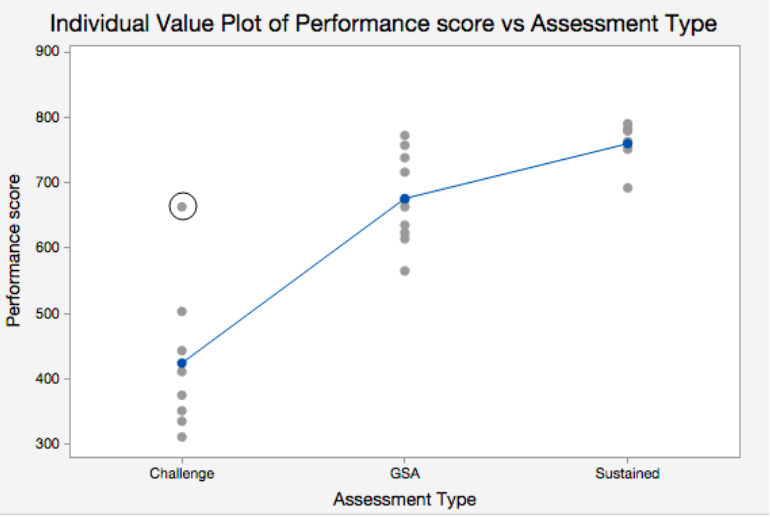

Figure 9: individual value plot of performance score vs. assessment type

Organization SIC120 was investigated for this high score and it turns out that this organization has multiple Sterling examiners some of them are senior examiners and they were

implementing the Baldrige management model internally for many years before going into the Challenge assessment program. The organization scored high in all categories and received the Sterling Challenge Award on May 2014. As a matter of fact, one of the senior examiners mentioned that they used the GSA Assessment criteria when applying for the challenge assessment program, and they also won the GSA in 2015 when they applied for GSA level assessment. Based on this we can comfortably remove point # 8 from the model and redo the ANOVA test for better fit.

ANOVA test after removing the outlier data

Table 12 below shows the performance scores for organizations from different assessment groups. Note that point number 8 in the Challenge assessment group was removed since it was an outlier.

Table 12: Different assessment programs data without outliers

# Of Organization	Assessment scores per program		
	Challenge	GSA	Sustained
1	311	565	692
2	335	614	751
3	351	623	763
4	375	635	779
5	411	663	782
6	443	673	791
7	575	716	
8		738	
9		757	
10		772	

The results below confirm a statistical difference among the three different performance excellence programs, as P-value is less than 0.05 as per Table 13 below.

Table 13: ANOVA-Challenge, GSA, Sustain

Method	**One way ANOVA**				
Null hypothesis	All means are equal				
Alternative hypothesis	At least one mean is different				
Significance level	$\alpha = 0.05$				
Factor Information					
Factor	**Levels**	**Values**			
Assessment Type_1	3	Challenge, GSA, Sustained			
Analysis of Variance					
Source	**DF**	**Adj SS**	**Adj MS**	**F-Value**	**P-Value**
Assessment Type_1	2	516368.982	258184.491	68.36	<0.0001
Error	20	75540.757	3777.038		
Total	22	591909.739			

Using Tukey method for multiple comparisons to compare each pair of groups (Table 14: Tukey method to compare pairs of means) confirmed a statistical difference in mean performance excellence score among the three performance excellence assessment programs (Challenge, GSA and Sustained). This is changed from the previous ANOVA model, where GSA and Sustained assessment programs did not have a statistical difference.

Table 14: Tukey method to compare pairs of means

Grouping Information Using the Tukey Method and 95% Confidence

Assessment Type_1	N	Mean	Grouping		
Sustained	6	759.500000	A		
GSA	10	675.600000		B	
Challenge	7	389.857143			C

Means that do not share a letter are significantly different.

Tukey Simultaneous Tests for Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adjusted P-Value
GSA-Challenge	285.74	30.29	(209.07, 362.41)	9.43	<0.0001
Sustained-Challenge	369.64	34.19	(283.09, 456.20)	10.81	<0.0001
Sustained-GSA	83.90	31.74	(3.56, 164.24)	2.64	0.0396

Individual confidence level = 98.01%

The model summary in Table 15 (Tukey method to compare pairs of means) confirms a better model after removing the outlier data. S in this model is equal to 61.45 compared to 82.88 from the previous model, remember the lower the S the better. R^2 is equal to 87.24% compared to 76.3% from the previous model, the higher R^2 the better.

Table 15: Model Summary

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
61.4576102	87.24%	85.96%	83.44%

Means

Assessment Type_1	N	Mean	StDev	95% CI
Challenge	7	389.86	67.12	(341.40, 438.31)
GSA	10	675.60	68.36	(635.06, 716.14)
Sustained	6	759.50	35.94	(707.16, 811.84)

Pooled StDev = 61.4576102

Using the residual plots to confirm the assumptions of the analysis. Figure 10 (Histogram) shows the histogram of the residual.

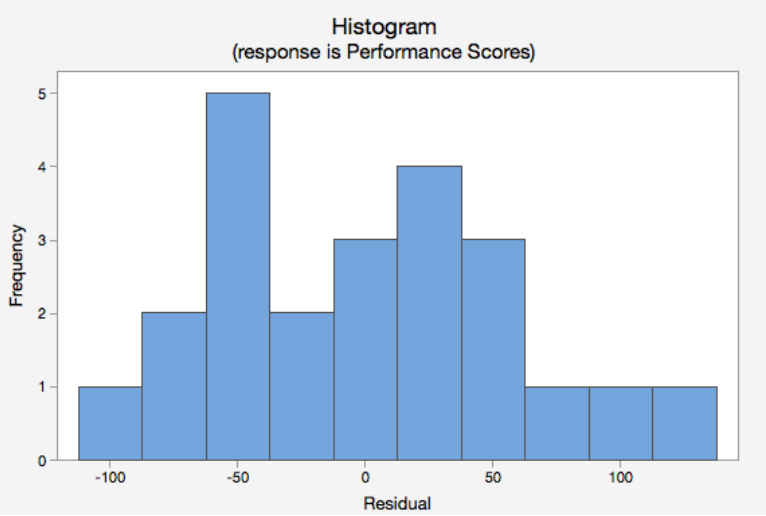

Figure 10: Histogram

Figure 11 (Residual vs. Fits) shows the residuals versus fits plot to versify the assumption that the residual are randomly distributed and have consistent variance.

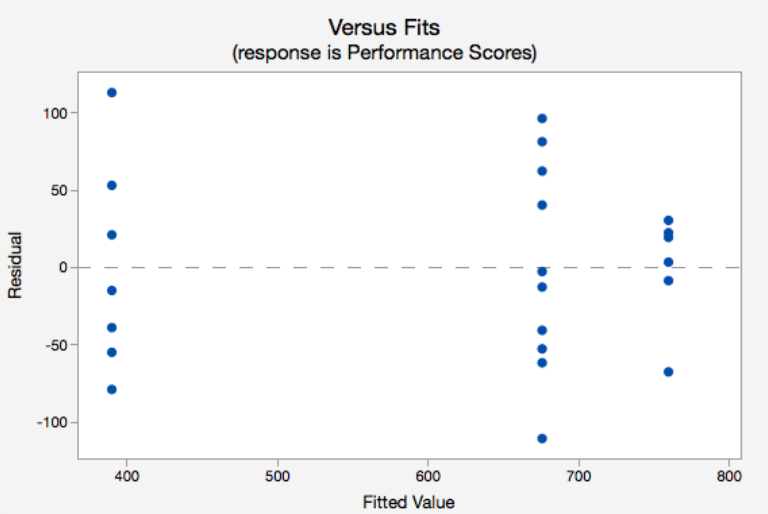

Figure 11: Residual vs. Fits

Using the normal plot of residuals to verify the assumption that the residuals are normally distributed. The normal probability plot of the residuals should approximately follow a straight line. Figure 12 (Normality test without outlier point) show that the normal probability plot of the residuals here follows a straight line, which satisfy the normality assumption in this model.

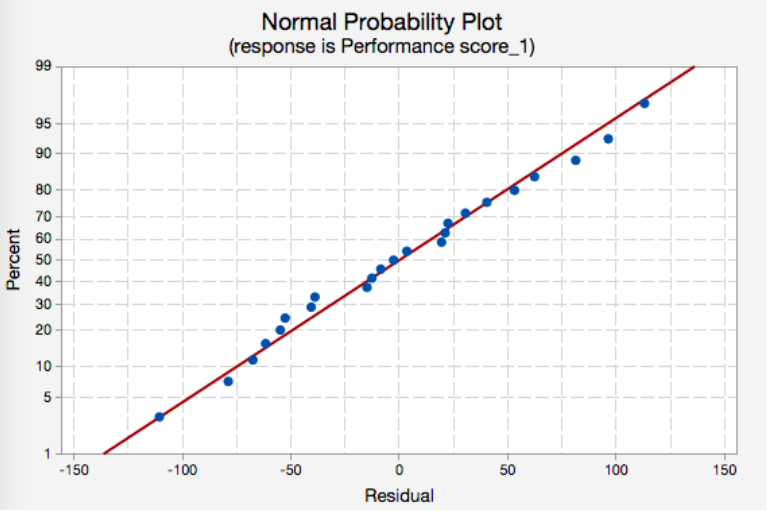

Figure 12: Normality test without outlier point

Figure 13 (Residual vs. Order) shows that residual are independent from one another, which verify the assumption of the analysis.

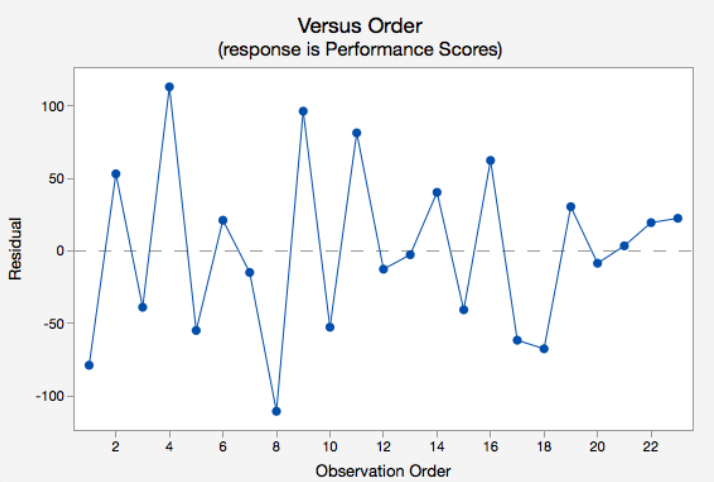

Figure 13: Residual vs. Order

The new model strongly confirms the main assumption in this research, which is implementing the different performance excellence assessment programs do improve the organizations' performance Figure 14 (Performance score per program) shows the mean of performance score of each assessment group; Challenge, GSA, and Sustain.

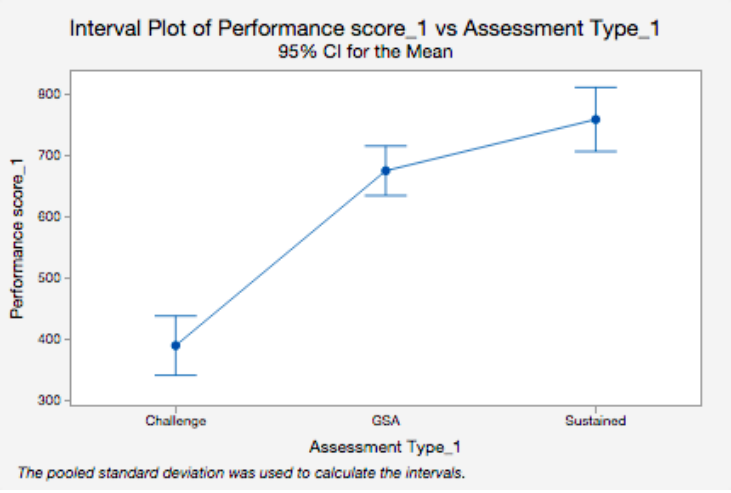

Figure 14: Performance score per program

Figure 15 (individual value plot of performance score vs. assessment type) below shows the individual value of each organization in the three different assessments of Sterling performance excellence programs.

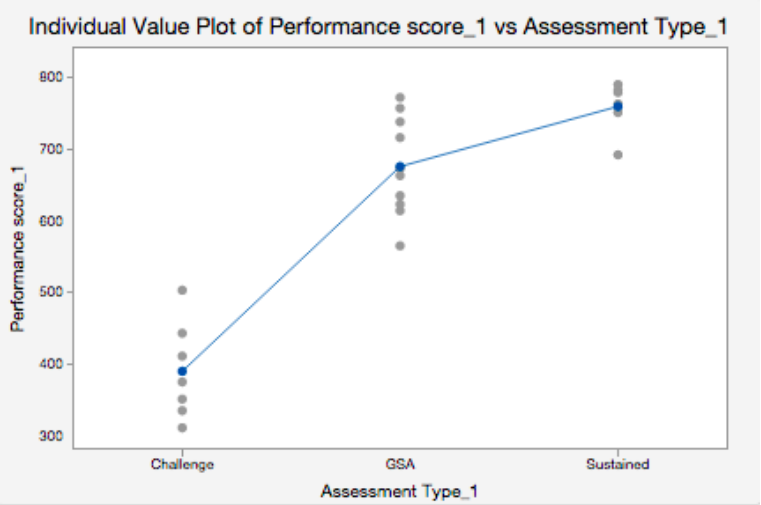

Figure 15: Individual value plot of performance score vs. assessment type

Organizations innovation data

The Twenty-four sampled organization were also surveyed for innovation capability assessment (Appendix A). Thirteen of the twenty-Four have responded, a response rate of 54.17%. Eleven of the thirteen organizations' data were accepted and two were rejected due to low number of sample size. Table 16 (innovation scores) shows the innovation data collected from the surveyed organizations.

Table 16: Innovation scores

Organization Code	Innovation overall score	Innovation Value	Innovation Behavior	Innovation Climate	Innovation Resources	Innovation Process	Innovation Success
SIC109	1.54	1.67	1.33	1.22	2.50	1.33	1.17
SIC124							
SIC114	1.72	1.78	1.89	1.56	1.22	1.67	2.22
SIC123							
SIC125							
SIC117	2.76	3	3.06	3.5	2.44	2.11	2.44
SIC126							
SIC120	3.76	4.33	4.22	3.22	3.94	3.33	3.50
SIC116							
SIC121							
SIC108	3.85	4.00	4.67	4.11	3.33	2.89	4.11
SIC111							
SIC118							
SIC103							
SIC107	4.28	4.5	4.35	4.28	4.11	3.9	4.53
SIC112							
SIC110	4.56	4.56	4.56	4.67	4.56	4.44	4.56
SIC115							
SIC127							
SIC104	3.96	3.94	4.06	4.00	3.78	3.72	4.28
SIC102	4.05	4.33	4.41	4.22	3.74	3.74	3.85
SIC122							
SIC101	3.29	3.64	3.45	3.12	3.05	3.05	3.45
SIC106	4.29	4.33	4.28	4.28	4.33	4.00	4.50

The collected innovation data reflects the innovation measure for organizations participated in the three different performance excellence assessment programs; four data points in Sterling challenge assessment program, three data points in Sterling GSA program, and four data points in the Sterling Sustained program (Table 17: Innovation scores).

Table 17: innovation overall scores

# Of Organization	Innovation Value survey data		
	Challenge	GSA	Sustained
1	1.54	3.85	3.96
2	1.72	4.28	4.05
3	2.76	4.56	3.29
4	3.76		4.29

Note that the Organization SIC120 that was removed from the performance excellence ANOVA model due to the outlier result had an innovation score of 3.76 out of 5 in the challenge group. This also reflects a high innovation score for this group and shows an outlier in the individual plot for innovation score per assessment program (Table 17). Based on this we will also remove the related innovation scores of SIC120.

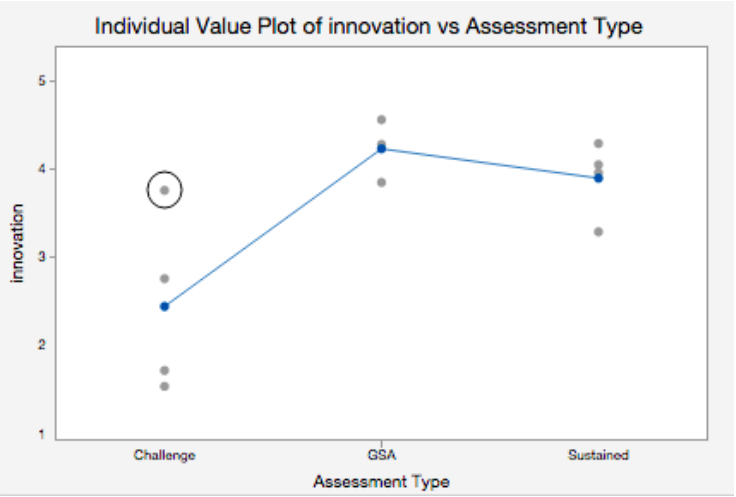

Figure 16: Individual plot for innovation score per assessment program

Innovation data analysis

In this part, ANOVA testing will be used to analyze the collected innovation data from organizations that went through the three different Florida Sterling (Baldrige) performance excellence programs. After removing the outlier data from the collected innovation scores, table 18 (innovation scores without outliers) represents the overall innovation scores that will be tested using ANOVA in this section.

Table 18: Innovation scores without outliers

# Of Organization	Innovation Value survey data		
	Challenge	GSA	Sustained
1	1.54	3.85	3.96
2	1.72	4.28	4.05
3	2.76	4.56	3.29
4			4.29

The ANOVA results below confirm a statistical difference among the three innovation mean scores of the different performance excellence programs' groups; as P-value is less than 0.05, see Table 19.

Table 19: ANOVA-Innovation Challenge, GSA, Sustain

Method	**ANOVA one-way**				
Null hypothesis	All means are equal				
Alt. hypothesis	At least one mean is different				
Significance level	α = 0.05				
Equal variances were assumed for the analysis.					
Factor	**Levels**	**Values**			
Assessment Type_1	3	Challenge, GSA, Sustained			
Analysis of Variance					
Source	**DF**	**Adj SS**	**Adj MS**	**F-Value**	**P-Value**
Assessment Type_1	2	8.8718583	4.43592917	18.55	0.0016
Error	7	1.6735417	0.23907738		
Total	9	10.5454			

Using Tukey method for multiple comparisons to compare each pair of groups (Table 20: Tukey method to compare pairs of means) confirmed a statistical difference in mean innovation score between Challenge and GSA assessments programs' groups, Also between Challenge and Sustained assessments programs' groups. However, there is no statistical difference in the mean innovation score between GSA and Sustained assessments programs' groups.

Table 20: Tukey method to compare pairs of means

Grouping Information Using the Tukey Method and 95% Confidence

Assessment Type_1	N	Mean	Grouping	
GSA	3	4.23	A	
Sustained	4	3.8975	A	
Challenge	3	2.00667		B

Means that do not share a letter are significantly different.

Tukey Simultaneous Tests for Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adj. P-Value
GSA-Challenge	2.2233	0.3992	(1.046, 3.40)	5.57	0.0021
Sustained-Challenge	1.8908	0.3734	(0.790, 2.99)	5.06	0.0036
Sustained-GSA	-0.3325	0.3734	(-1.434, 0.768)	-0.89	0.6629

Individual confidence level = 97.86%

Tukey method with 95% CIs shows the differences between pair of assessment groups (Figure 14: Tukey 95% CI difference of means for innovation score). Any test does not include zero represent a statistical difference. In this case, both GSA and Sustained programs have a statistical difference than Challenge group; however, there is no statistical difference between GSA and Sustained assessment programs innovation mean scores.

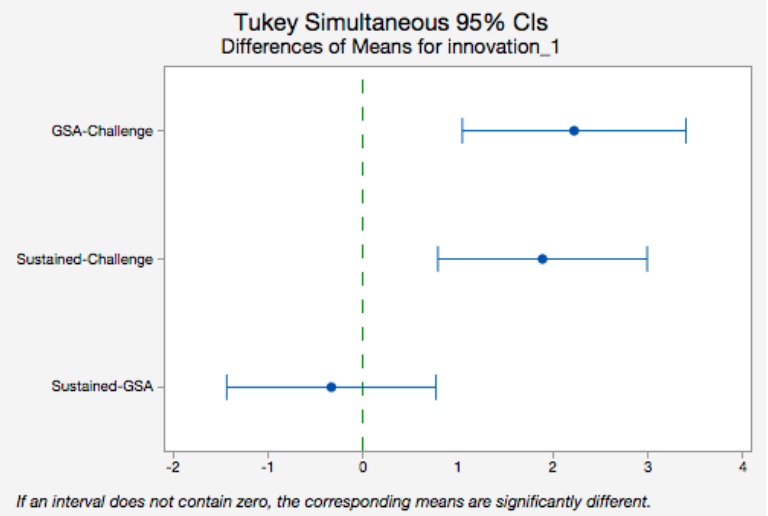

Figure 17: Tukey 95% CI difference of means for innovation score

Using Dunnett Method and 95% confidence to test the difference of innovation scores' means in comparison using Challenge assessment group as a control group. Table: 21 (Dunnett method test using Challenge assessment as a control group).

Table 21: Dunnett method test using Challenge assessment as a control group

Grouping Information Using the Dunnett Method and 95% Confidence			
Assessment Type_1	**N**	**Mean**	**Grouping**
Challenge (control)	3	2.00666667	A
GSA	3	4.23	
Sustained	4	3.8975	

Means not labeled with the letter A are significantly different from the control level mean.

Dunnett Simultaneous Tests for Level Mean - Control Mean

Difference of Levels	**Difference of Means**	**SE of Difference**	**95% CI**	**T-Value**	**Adjusted P-Value**
GSA-Challenge	2.2233	0.3992	(1.128, 3.319)	5.57	0.0015
Sustained-Challenge	1.8908	0.3734	(0.866, 2.916)	5.06	0.0026

Individual confidence level = 97.13%

Figure 18 (Dunnett method test using Challenge assessment as a control group) below provides a visual representation of the Dunnett test, where Challenge assessment is the control group. Any test does not include zero represent a statistical difference, which means that both assessment groups, GSA and Sustained groups, have a statistical difference in innovation scores than the control group "Challenge group".

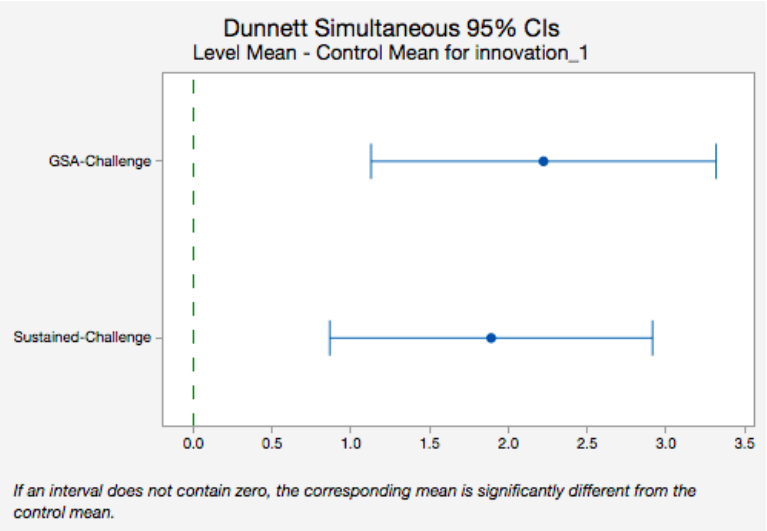

Figure 18: Dunnett method test using Challenge assessment as a control group

The model summary in Table 22 below shows how well the model fits the data. S represents the standard deviation of how far the data values fall from the fitted values, the lower the S the better, here S is equal to .4889. R^2 measures the percentage of variation in the response that is explained by the model, the higher R^2 the better, R^2 equal to 84.13%. This means that 84.13% of the innovation variation is explained by changes in performance excellence.

Table 22: Innovation scores model summary

Model Summary				
S	R-sq	R-sq(adj)	R-sq(pred)	
0.488955398	84.13%	79.60%	66.76%	
Means				
Assessment Type_1	**N**	**Mean**	**StDev**	**95% CI**
Challenge	3	2.0067	0.6586	(1.3391, 2.6742)
GSA	3	4.23	0.3576	(3.5625, 4.8975)
Sustained	4	3.8975	0.4283	(3.3194, 4.4756)
Pooled StDev = 0.488955398				

Normality test was conducted on the collected data to check the normal distribution of the data, Figure 19 (Normality test for innovation scores). The normal probability plot of the residuals approximately follows a straight line, which satisfies the normality assumption for reliable results.

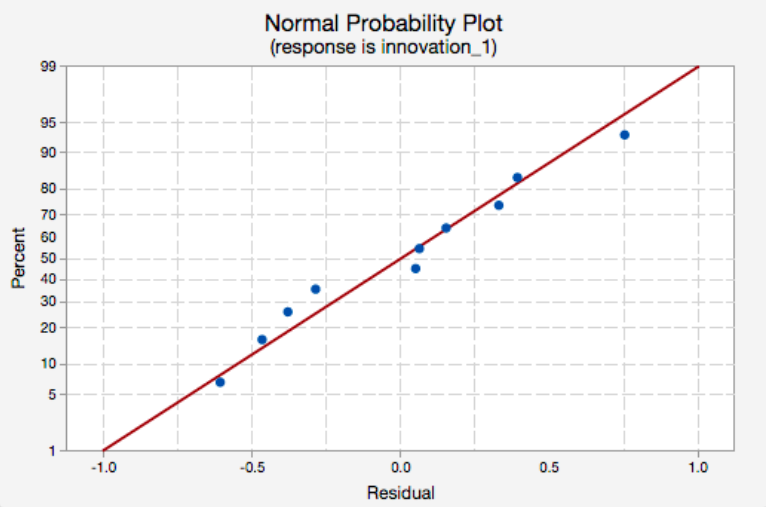

Figure 19: Normality test for innovation scores

Based on ANOVA test, Baldrige (Florida Sterling) performance excellence programs do have effect on organizations innovation. Comparing the innovation scores of the organizations that went through the Challenge performance excellence assessment with the innovation scores

of other organizations that did GSA and Sustained performance excellence programs. We see that the more experienced organizations with Baldrige framework and performance excellence have better innovation scores that the new organizations that just started Baldrige performance excellence. Figure 20 (interval plot of innovation vs assessment groups) and figure 21 (individual value plot of innovation vs. assessment groups) below provide a visual representation to the different performance excellence groups and their innovation scores.

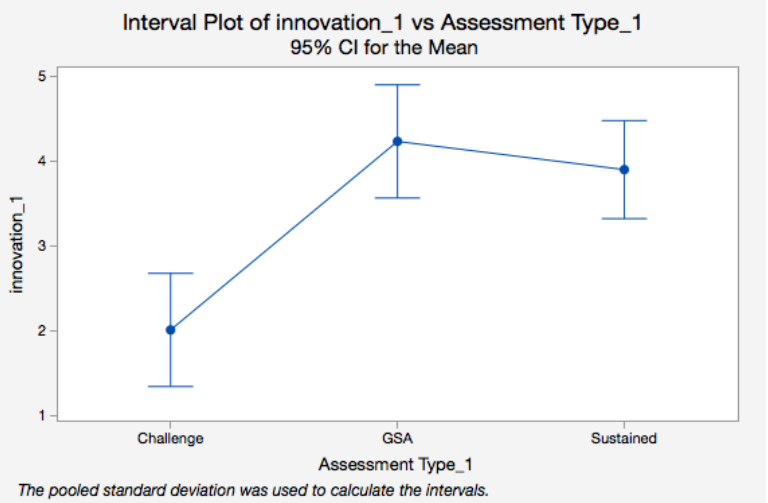

Figure 20: interval plot of innovation vs. assessment groups

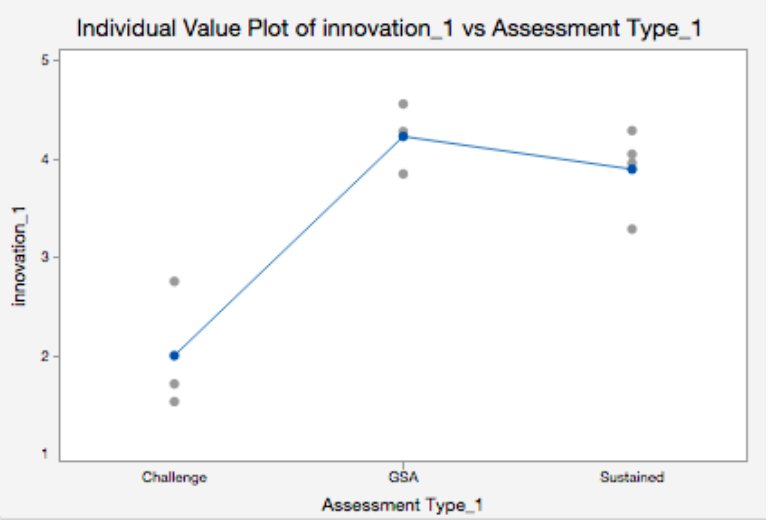

Figure 21: individual value plot of innovation vs. assessment groups

Innovation – Value

Innovation Value is the first building block of the Innovation building model that is used in this research. In the following section, the Baldrige performance excellence will be examined against organizations' Innovation Value using regression analysis. Table 23 (Innovation value vs. Performance excellence) show the innovation Value scores that were collected from the surveyed organizations and their performance excellence scores.

Table 23: Innovation value vs. Performance excellence

#	Assessment Type	Organization Code	Performance Score	Innovation Values
1	Challenge	SIC109	311	1.67
2	Challenge	SIC124	335	
3	Challenge	SIC114	351	1.78
4	Challenge	SIC123	375	
5	Challenge	SIC125	411	
6	Challenge	SIC117	443	3.00
7	Challenge	SIC126	575	
8	Challenge	SIC120	663	
9	GSA	SIC116	565	
10	GSA	SIC121	614	
11	GSA	SIC108	623	4.00
12	GSA	SIC111	635	
13	GSA	SIC118	663	
14	GSA	SIC103	673	
15	GSA	SIC107	716	4.5
16	GSA	SIC112	738	
17	GSA	SIC110	757	4.56
18	GSA	SIC115	772	
19	Sustained	SIC127	692	
20	Sustained	SIC104	751	3.94
21	Sustained	SIC102	763	4.33
22	Sustained	SIC122	779	
23	Sustained	SIC101	782	3.64
24	Sustained	SIC106	791	4.33

Correlation test: Pearson correlation of performance excellence score and Innovation Value score = 0.926, P-value= 0.0001

Based on the output of Pearson correlation of performance score and innovation's value, r= 0.926 which, indicates a high positive correlation between organization's Baldrige performance excellence and organization's innovation value building block of the innovation model.

Table 24: Linear regression test for Innovation Value vs. performance score

Analysis of Variance					
Source	**DF**	**Adj SS**	**Adj MS**	**F-Value**	**P-Value**
Regression	1	8.9800657	8.98006572	48.36	0.0001
Performance score	1	8.9800657	8.98006572	48.36	0.0001
Error	8	1.4855843	0.18569804		
Total	9	10.46565			
Model Summary					
S	**R-sq**	**R-sq(adj)**	**R-sq(pred)**		
0.430926949	85.81%	84.03%	78.41%		
Coefficients Term	**Coef**	**SE Coef**	**T-Value**	**P-Value**	**VIF**
Constant	0.2401	0.4985	0.48	0.6429	
Performance score	0.0053044	0.0007628	6.95	0.0001	1
Regression Equation					
Innovation_Values = 0.2401 + 0.0053044 Performance score					

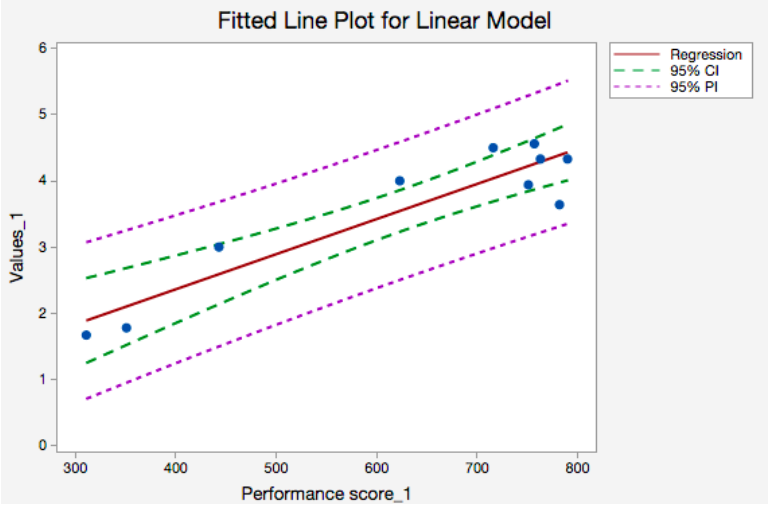

Figure 22: Fitted line plot for linear model

The P-value of the linear model is less than 0.05, however, we noticed some curvature in the data in the Fitted line plot, the model $R^2 = 85.81\%$ and S= 0.4309. So in order to get a better fit for the model, the test will be repeated with an addition of a polynomial term.

Table 25: Quadratic regression test for innovation value vs. performance excellence

Analysis of Variance					
Source	**DF**	**Adj SS**	**Adj MS**	**F-Value**	**P-Value**
Regression	2	9.7791853	4.88959263	49.86	<0.0001
Performance score	1	1.3109633	1.31096333	13.37	0.0081
Performance score^2	1	0.7991195	0.79911954	8.15	0.0245
Error	7	0.6864647	0.09806639		
Total	9	10.46565			
Model Summary					
S	**R-sq**	**R-sq(adj)**	**R-sq(pred)**		
0.31315554	93.44%	91.57%	87.43%		
Coefficients Term	**Coef**	**SE Coef**	**T-Value**	**P-Value**	**VIF**
Constant	-4.331	1.642	-2.64	0.0335	
Performance score	0.023886	0.006533	3.66	0.0081	138.904791
Performance score^2	-0.000016647	0.000005832	-2.85	0.0245	138.904791
Regression Equation					
Innovation_Values = − 4.331 + 0.0239 Performance_score − 0.0000167 Performance_score^2					

The P-value of the new model is less than 0.05, which means that the terms involved in the regression model are ok. It's noticed that the model has improved after adding the polynomial term in the model, R^2 = 93.44%, which higher than previous model R^2 (85.81%) and S = 0.313 which is less than the previous model S (0.4309). Figure 23 (Fitted line plot for the quadratic model) shows the regression data has better fit with 95% CI and 95% PI.

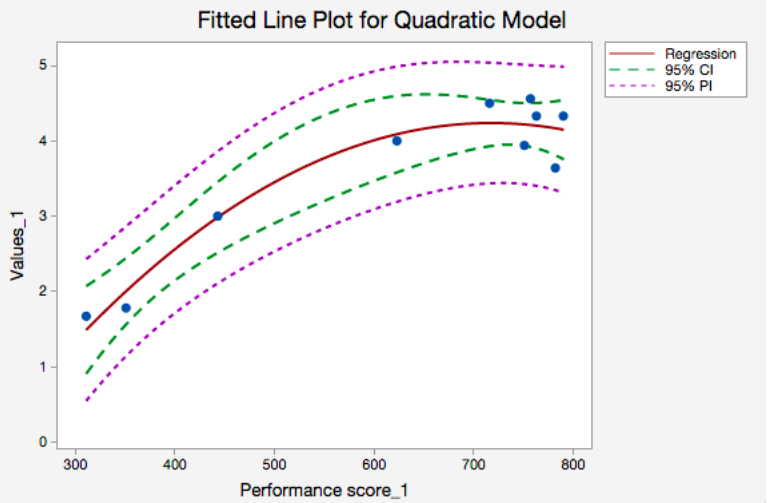

Figure 23: Fitted line plot for the quadratic model

ANOVA analysis will be used here to test the means of Innovation Value scores output from the three performance excellence assessment programs in order to find which program (group) has a statistical difference.

Table 26: ANOVA test for Innovation Value

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Assessment Type_1	2	8.8501833	4.42509167	19.17	0.0014
Error	7	1.6154667	0.23078095		
Total	9	10.46565			

Table 27: Tukey method test for Innovation Value

Grouping Information Using the Tukey Method and 95% Confidence				
Assessment Type_1	N	Mean	Grouping	
GSA	3	4.35	A	
Sustained	4	4.06	A	
Challenge	3	2.15		B
Means that do not share a letter are significantly different.				

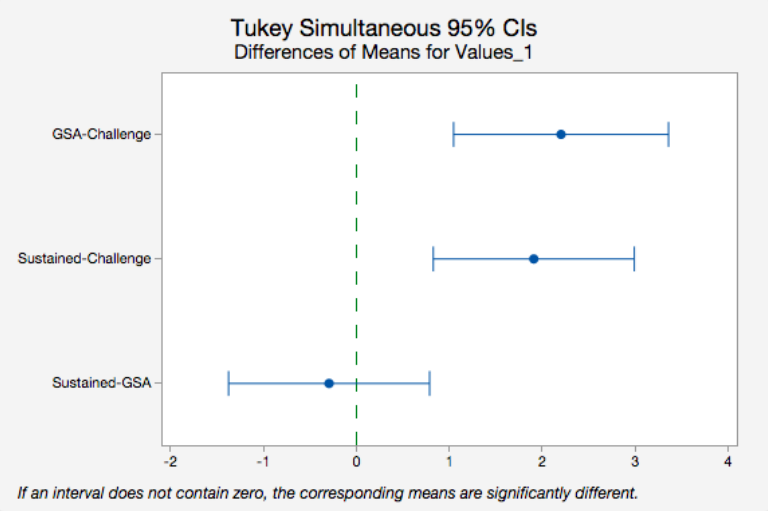

Figure 24: Tukey test difference of means for innovation value

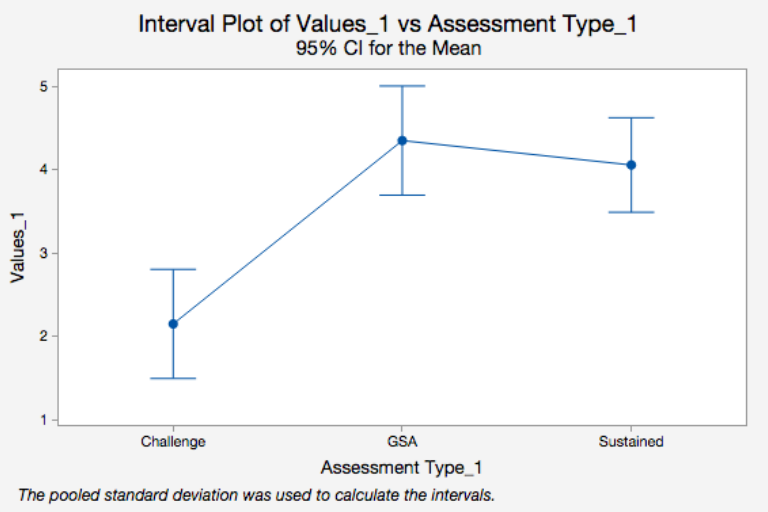

Figure 25: Interval Plot of Innovation value vs. assessment type

Innovation – Behavior

Innovation behavior is the second building block of building innovation capabilities within organization. In the following section, the Baldrige performance excellence will be

examined against organizations' Innovation Behavior using regression analysis. Table 28 (Innovation Behavior vs. Performance excellence) show the innovation Behavior scores that were collected from the surveyed organizations and their performance excellence scores.

Table 28: Innovation Behavior vs. Performance excellence

#	Assessment Type	Organization Code	Performance Score	Innovation Behavior
1	Challenge	SIC109	311	1.33
2	Challenge	SIC124	335	
3	Challenge	SIC114	351	1.89
4	Challenge	SIC123	375	
5	Challenge	SIC125	411	
6	Challenge	SIC117	443	3.06
7	Challenge	SIC126	575	
8	Challenge	SIC120	663	
9	GSA	SIC116	565	
10	GSA	SIC121	614	
11	GSA	SIC108	623	4.67
12	GSA	SIC111	635	
13	GSA	SIC118	663	
14	GSA	SIC103	673	
15	GSA	SIC107	716	4.35
16	GSA	SIC112	738	
17	GSA	SIC110	757	4.56
18	GSA	SIC115	772	
19	Sustained	SIC127	692	
20	Sustained	SIC104	751	4.06
21	Sustained	SIC102	763	4.41
22	Sustained	SIC122	779	
23	Sustained	SIC101	782	3.45
24	Sustained	SIC106	791	4.28

Correlation test: Pearson correlation of performance excellence score and Innovation Value score = 0.872, P-value= 0.001

Based on the output of Pearson correlation of performance score and innovation's value, r= 0.872 which, indicates a high positive correlation between organization's Baldrige performance excellence and organization's innovation Behavior building block of the innovation model.

Table 29: Linear regression for innovation Behavior vs. performance excellence

Analysis of Variance					
Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	1	9.3838505	9.38385052	25.31	0.001
Performance score_1	1	9.3838505	9.38385052	25.31	0.001
Error	8	2.9659895	0.37074869		
Total	9	12.34984			
Model Summary					
S	R-sq	R-sq(adj)	R-sq(pred)		
0.608891357	75.98%	72.98%	63.05%		
Coefficients Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	0.197	0.7044	0.28	0.7868	
Performance score_1	0.005422	0.001078	5.03	0.001	1
Regression Equation					
Innovation Behavior = 0.1970 + 0.005422 Performance score					

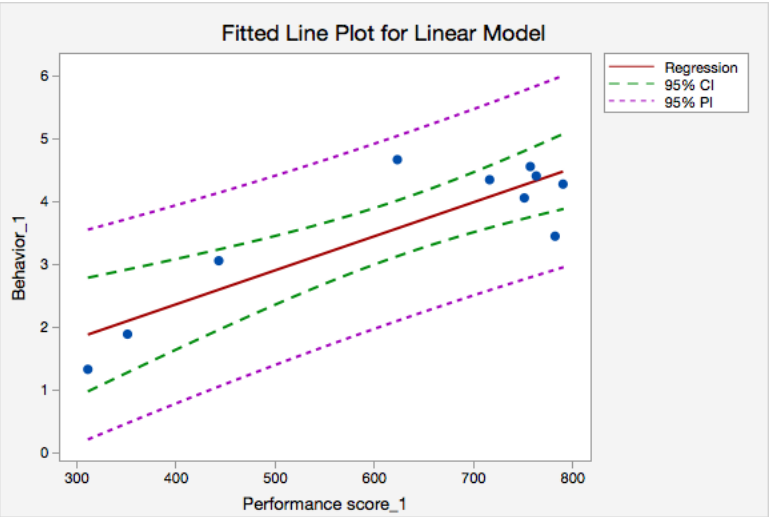

Figure 26: Fitted line plot for linear model

The P-value of the linear model is less than 0.05, however, we noticed some curvature in the data in the Fitted line plot, the model R2 = 75.98% and S= 0.6089. So in order to get a better fit for the model, the test will be repeated with an addition of a polynomial term.

Table 30: Quadratic regression for innovation Behavior vs. performance excellence

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	2	11.6032	5.80160	54.39	<0.0001
Performance score_1	1	3.04256	3.04256	28.53	0.0011
Performance score_1^2	1	2.2194	2.21936	20.81	0.0026
Error	7	0.7466	0.10666		
Total	9	12.34984			
Model Summary					
S	**R-sq**	**R-sq(adj)**	**R-sq(pred)**		
0.32659	93.95%	92.23%	88.60%		
Coefficients Term	**Coef**	**SE Coef**	**T-Value**	**P-Value**	**VIF**
Constant	-7.421	1.712	-4.33	0.0034	
Performance score	0.03639	0.006813	5.34	0.0011	138.905
Performance score^2	-0.000028	0.000006	-4.56	0.0026	138.905
Regression Equation					
Behavior_1 = − 7.421 + 0.036389 Performance score − 0.000027743 Performance score^2					

The P-value of the new model is less than 0.05, which means that the terms involved in the regression model are ok. It's been noticed that the model has improved with the use of the polynomial term where R^2 = 93.95%, higher than previous model R^2 (75.98%) and S = 0.313, less than the previous model S (0.6089). Figure 20 (Fitted line plot for the quadratic model) shows the regression data has better fit with 95% CI and 95% PI.

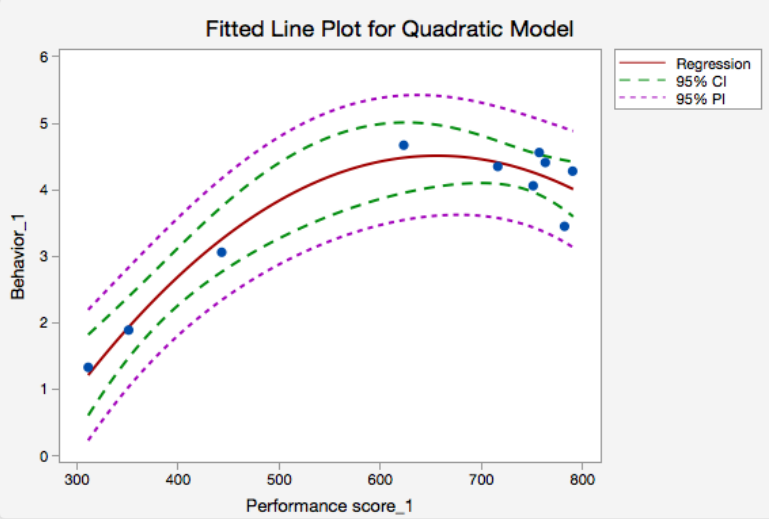

Figure 27: Fitted line plot for quadratic model

ANOVA analysis will be used here to test the means of Innovation Behavior scores output from the three performance excellence assessment programs in order to find which program (group) has a statistical difference.

Table 31: ANOVA test for Innovation Behavior

Analysis of Variance					
Source	DF	Adj SS	Adj MS	F-Value	P-Value
Assessment Type_1	2	10.1959067	5.09795333	16.57	0.0022
Error	7	2.1539333	0.30770476		
Total	9	12.34984			

Table 32: Tukey method test for Innovation Behavior

Grouping Information Using the Tukey Method and 95% Confidence				
Assessment Type_1	N	Mean	Grouping	
GSA	3	4.52666667	A	
Sustained	4	4.05	A	
Challenge	3	2.09333333		B
Means that do not share a letter are significantly different.				

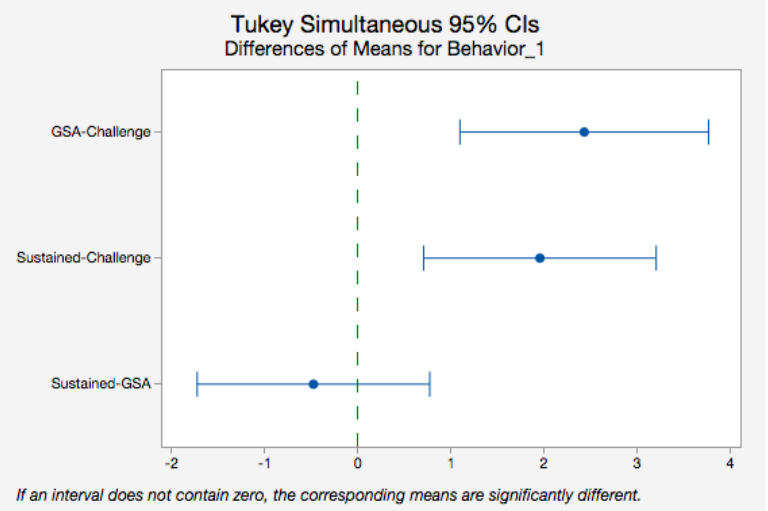

Figure 28: Tukey test different of means for Innovation Behavior

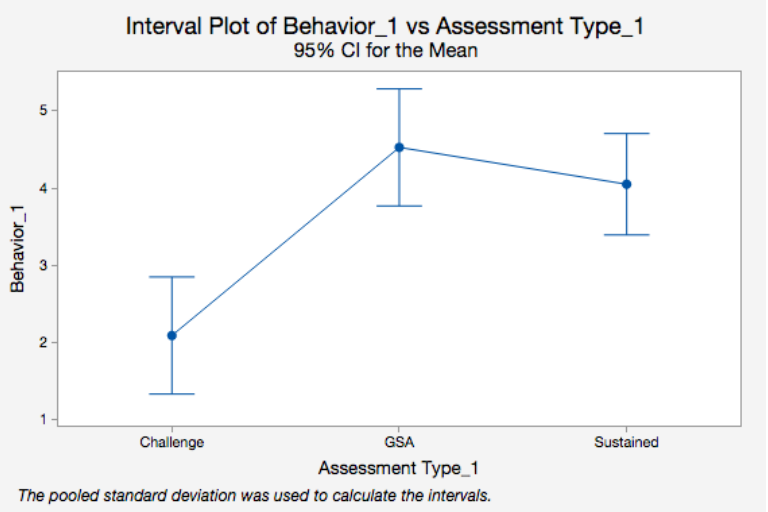

Figure 29: Interval plot of Innovation Behavior vs. assessment type

Innovation – Climate

Innovation Climate is the third building block of building innovation capabilities within organization. In the following section, the Baldrige performance excellence will be examined against organizations' Innovation Behavior using regression analysis. Table 33 (Innovation Behavior vs. Performance excellence) show the innovation Behavior scores that were collected from the surveyed organizations and their performance excellence scores.

Table 33: Innovation Climate vs. Performance excellence

#	Assessment Type	Organization Code	Performance Score	Innovation Climate
1	Challenge	SIC109	311	1.22
2	Challenge	SIC124	335	
3	Challenge	SIC114	351	1.56
4	Challenge	SIC123	375	
5	Challenge	SIC125	411	
6	Challenge	SIC117	443	3.50
7	Challenge	SIC126	575	
8	Challenge	SIC120	663	
9	GSA	SIC116	565	
10	GSA	SIC121	614	
11	GSA	SIC108	623	4.11
12	GSA	SIC111	635	
13	GSA	SIC118	663	
14	GSA	SIC103	673	
15	GSA	SIC107	716	4.28
16	GSA	SIC112	738	
17	GSA	SIC110	757	4.67
18	GSA	SIC115	772	
19	Sustained	SIC127	692	
20	Sustained	SIC104	751	4.00
21	Sustained	SIC102	763	4.22
22	Sustained	SIC122	779	
23	Sustained	SIC101	782	3.12
24	Sustained	SIC106	791	4.28

Correlation test: Pearson correlation of performance excellence score and Innovation Value score = 0.842, P-value= 0.0023

Based on the output of Pearson correlation of performance score and innovation's value, r= 0.842 which, indicates a high positive correlation between organization's Baldrige performance excellence and organization's innovation Behavior building block of the innovation model.

Table 34: Linear regression for innovation Climate vs. performance excellence

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	1	9.08938	9.0893800	19.43	0.0023
Performance score	1	9.08938	9.0893800	19.43	0.0023
Error	8	3.74306	0.4678825		
Total	9	12.83244			
Model Summary					
S	R-sq	R-sq(adj)	R-sq(pred)		
0.684019368	70.83%	67.19%	52.09%		
Coefficients Term	**Coef**	**SE Coef**	**T-Value**	**P-Value**	**VIF**
Constant	0.1409	0.7913	0.18	0.8631	
Performance score	0.005337	0.001211	4.41	0.0023	1
Regression Equation					
Innovation Climate = 0.1409 + 0.005337 Performance score_1					

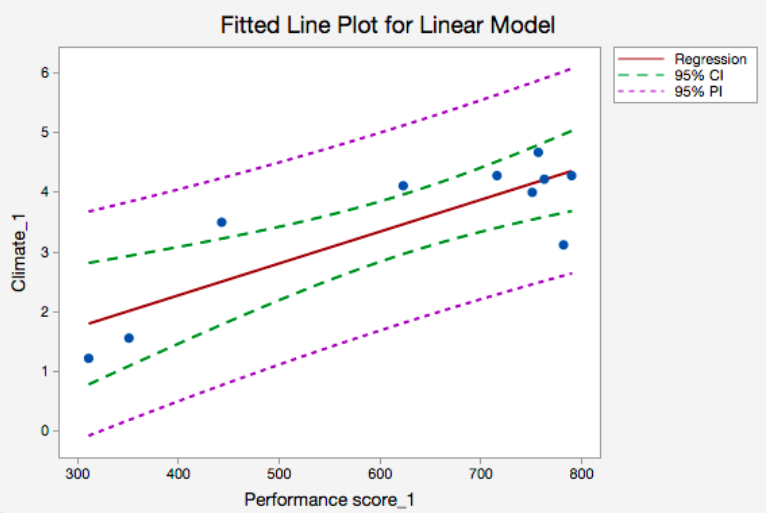

Figure 30: Fitted line plot for linear model

The P-value of the linear model is less than 0.05, however, we noticed some curvature in the data in the Fitted line plot, the model R2 = 70.83% and S= 0.684. So in order to get a better fit for the model, the test will be repeated with an addition of a polynomial term.

Table 35: Quadratic regression for innovation Climate vs. performance excellence

Analysis of Variance					
Source	**DF**	**Adj SS**	**Adj MS**	**F-Value**	**P-Value**
Regression	2	11.3620391	5.68101953	27.05	0.0005
Performance score	1	3.0902211	3.09022114	14.71	0.0064
Performance score^2	1	2.272659	2.27265902	10.82	0.0133
Error	7	1.4704009	0.21005728		
Total	9	12.83244			
Model Summary					
S	**R-sq**	**R-sq(adj)**	**R-sq(pred)**		
0.45832006	88.54%	85.27%	78.20%		
Coefficients Term	**Coef**	**SE Coef**	**T-Value**	**P-Value**	**VIF**
Constant	-7.568	2.403	-3.15	0.0162	
Performance score	0.036673	0.009561	3.84	0.0064	138.905
Performance score^2	-0.000028074	0.000008535	-3.29	0.0133	138.905
Regression Equation					
Innovation Climate = − 7.568 + 0.036673 Performance score − 0.000028074 Performance score^2					

The P-value of the new model is less than 0.05, which means that the terms involved in the regression model are ok. It's noticed that the model has improved with the use of the polynomial term where $R^2 = 88.54\%$, higher than previous model R^2 (70.83%) and S = 0.458, less than the previous model S (0.684). Figure 20 (Fitted line plot for the quadratic model) shows the regression data has better fit with 95% CI and 95% PI.

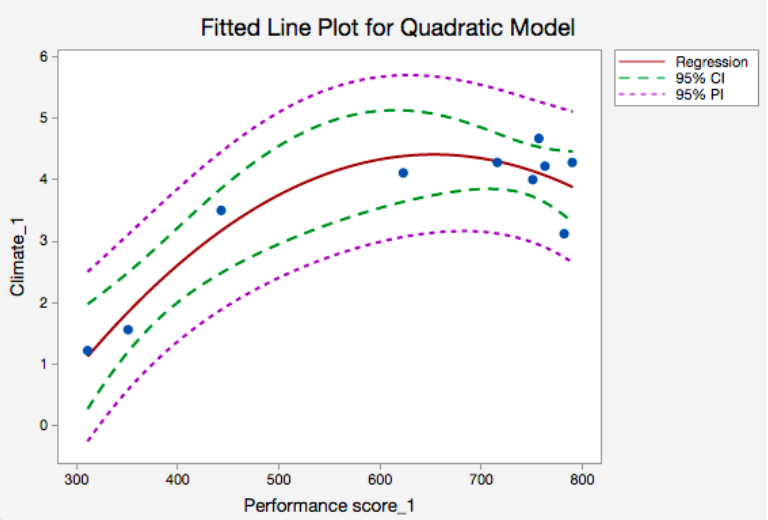

Figure 31: Fitted line plot for quadratic model

ANOVA analysis will be used here to test the means of Innovation Climate scores output from the three performance excellence assessment programs in order to find which program (group) has a statistical difference.

Table 36: ANOVA test for Innovation Climate

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Assessment Type_1	2	8.7766067	4.38830333	7.57	0.0177
Error	7	4.0558333	0.57940476		
Total	9	12.83244			

Table 37: Tukey method test for Innovation Climate

Grouping Information Using the Tukey Method and 95% Confidence				
Assessment Type_1	N	Mean	Grouping	
GSA	3	4.35333333	A	
Sustained	4	3.905	A	
Challenge	3	2.09333333		B
Means that do not share a letter are significantly different.				

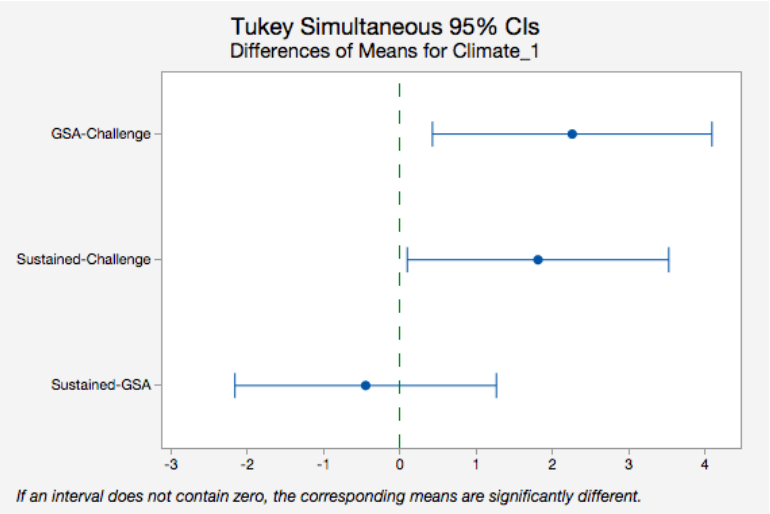

Figure 32: Tukey test different of means for Innovation Climate

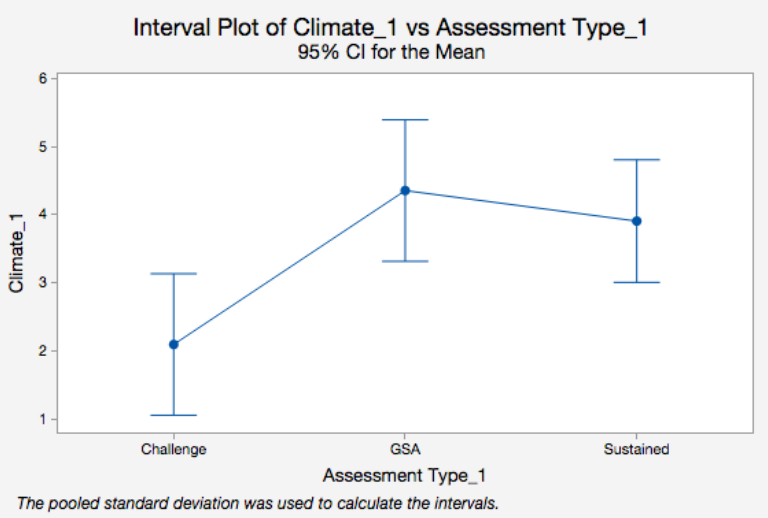

Figure 33: Interval plot of Innovation Climate vs. assessment type

Innovation – Resources

Innovation Resources is the fourth building block of building innovation capabilities within organization. In the following section, the Baldrige performance excellence will be examined against organizations' Innovation Resources using regression analysis. Table 38 (Innovation Resources vs. Performance excellence) show the innovation Resources scores that were collected from the surveyed organizations and their performance excellence scores.

Table 38: Innovation Resources vs. Performance excellence

#	Assessment Type	Organization Code	Performance Score	Innovation Resources
1	Challenge	SIC109	311	2.50
2	Challenge	SIC124	335	
3	Challenge	SIC114	351	1.22
4	Challenge	SIC123	375	
5	Challenge	SIC125	411	
6	Challenge	SIC117	443	2.44
7	Challenge	SIC126	575	
8	Challenge	SIC120	663	
9	GSA	SIC116	565	
10	GSA	SIC121	614	
11	GSA	SIC108	623	3.33
12	GSA	SIC111	635	
13	GSA	SIC118	663	
14	GSA	SIC103	673	
15	GSA	SIC107	716	4.11
16	GSA	SIC112	738	
17	GSA	SIC110	757	4.56
18	GSA	SIC115	772	
19	Sustained	SIC127	692	
20	Sustained	SIC104	751	3.78
21	Sustained	SIC102	763	3.74
22	Sustained	SIC122	779	
23	Sustained	SIC101	782	3.05
24	Sustained	SIC106	791	4.33

Correlation test: Pearson correlation of performance excellence score and Innovation Resources score = 0.8439, P-value= 0.0021

Based on the output of Pearson correlation of performance score and innovation's Resources, r= 0.872 which, indicates a high positive correlation between organization's Baldrige performance excellence and organization's innovation Resources building block of the innovation model.

Table 39: Linear regression for innovation Resources vs. performance excellence

Analysis of Variance					
Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	1	6.76398365	6.76398365	19.79	0.0021
Performance score_1	1	6.76398365	6.76398365	19.79	0.0021
Error	8	2.73365635	0.34170704		
Total	9	9.49764			
Model Summary					
S	R-sq	R-sq(adj)	R-sq(pred)		
0.584557134	71.22%	67.62%	46.03%		
Coefficients					
Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	0.4117	0.6763	0.61	0.5595	
Performance score_1	0.004604	0.001035	4.45	0.0021	1
Regression Equation					
Innovation Resources = 0.4117 + 0.004604 Performance score					

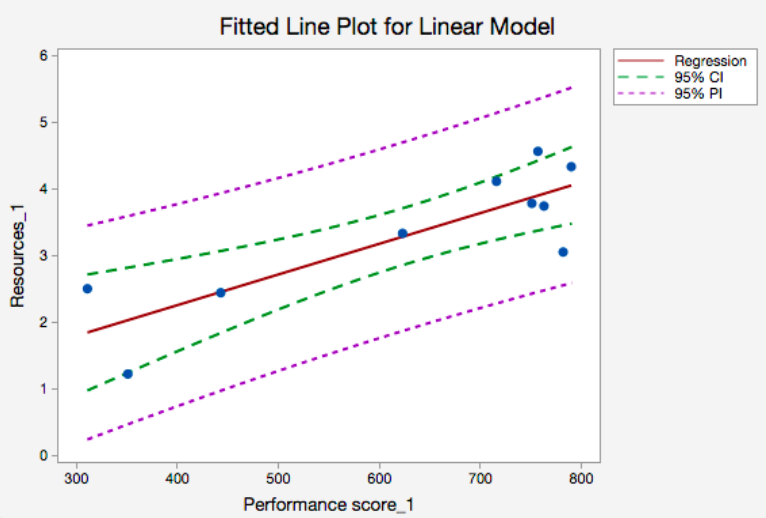

Figure 34: Fitted line plot for linear model

The P-value of the linear model is less than 0.05, however, however, when the test was done with quadratic and cubic regression models the P-values were more than 0.05, so the linear regression model is the best fit with R2 = 71.22% and S= 0.584.

ANOVA analysis will be used here to test the means of Innovation Resources scores output from the three performance excellence assessment programs in order to find which program (group) has a statistical difference.

Table 40: ANOVA test for Innovation Resources

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Assessment Type_1	2	6.85467333	3.42733667	9.08	0.0114
Error	7	2.64296667	0.37756667		
Total	9	9.49764			

Table 41: Tukey method test for Innovation Resources

Assessment Type_1	N	Mean	Grouping	
GSA	3	4	A	
Sustained	4	3.725	A	
Challenge	3	2.05333		B

Means that do not share a letter are significantly different.

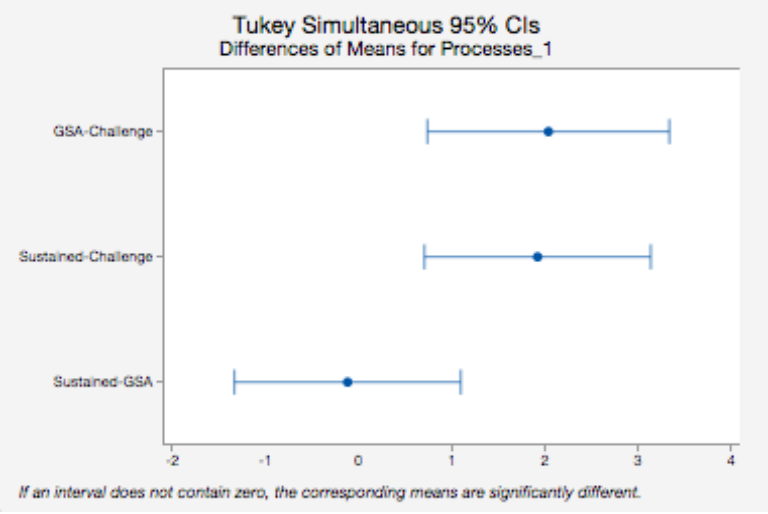

Figure 35: Tukey test different of means for Innovation Resources

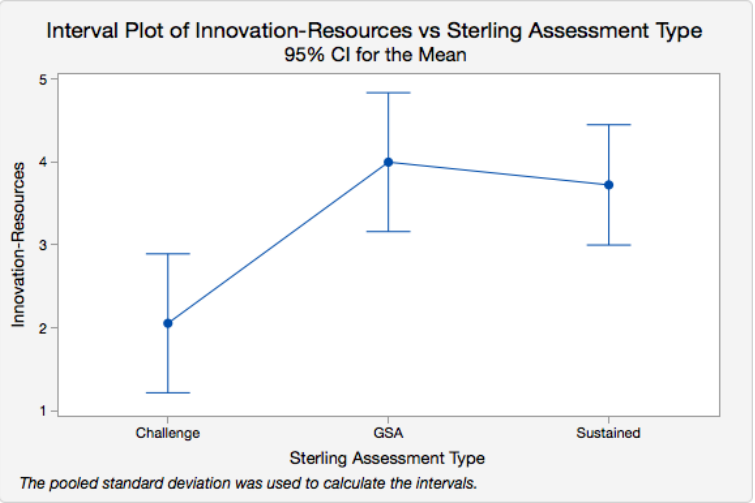

Figure 36: Interval plot for innovation resources vs. assessment type

Innovation – Process

Innovation Process is the fifth building block of building innovation capabilities within organization. In the following section, the Baldrige performance excellence will be examined against organizations' Innovation Process using regression analysis. Table 42 (Innovation Process vs. Performance excellence) show the innovation Process scores that were collected from the surveyed organizations and their performance excellence scores.

Table 42: Innovation process vs. performance excellence

#	Assessment Type	Organization Code	Performance Score	Innovation Process
1	Challenge	SIC109	311	1.33
2	Challenge	SIC124	335	
3	Challenge	SIC114	351	1.67
4	Challenge	SIC123	375	
5	Challenge	SIC125	411	
6	Challenge	SIC117	443	2.11
7	Challenge	SIC126	575	
8	Challenge	SIC120	663	
9	GSA	SIC116	565	
10	GSA	SIC121	614	
11	GSA	SIC108	623	2.89
12	GSA	SIC111	635	
13	GSA	SIC118	663	
14	GSA	SIC103	673	
15	GSA	SIC107	716	3.90
16	GSA	SIC112	738	
17	GSA	SIC110	757	4.44
18	GSA	SIC115	772	
19	Sustained	SIC127	692	
20	Sustained	SIC104	751	3.72
21	Sustained	SIC102	763	3.74
22	Sustained	SIC122	779	
23	Sustained	SIC101	782	3.05
24	Sustained	SIC106	791	4.00

Correlation test: Pearson correlation of performance excellence score and Innovation Resources score = 0.932, P-value= 0.0001

Based on the output of Pearson correlation of performance score and innovation's Resources, r= 0.932 which, indicates a high positive correlation between organization's Baldrige performance excellence and organization's innovation Resources building block of the innovation model.

Table 43: Linear regression for innovation process vs. performance excellence

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	1	8.9014157	8.90141569	53.13	<0.0001
Performance score	1	8.9014157	8.90141569	53.13	<0.0001
Error	8	1.3404343	0.16755429		
Total	9	10.24185			

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.409333957	86.91%	85.28%	81.32%

Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	-0.2352	0.4736	-0.5	0.6328	
Performance score_1	0.0052811	0.0007246	7.29	<0.0001	1

Regression Equation

Innovation Processes = − 0.2352 + 0.0052811 Performance score

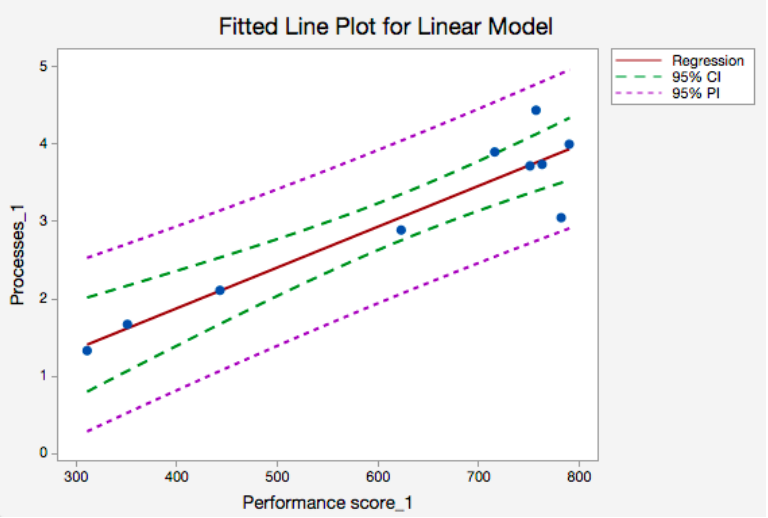

Figure 37: Fitted line plot for linear model

The P-value of the linear model is less than 0.05, however, when the test was done with quadratic and cubic regression models the P-values were more than 0.05, so The linear regression model is the best fit with R2 = 86.91% and S= 0.4093.

ANOVA analysis will be used here to test the means of Innovation Process scores output from the three performance excellence assessment programs in order to find which program (group) has a statistical difference.

Table 44: ANOVA test for Innovation Process

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Assessment Type_1	2	8.20444	4.10222083	14.09	0.0035
Error	7	2.037408	0.29105833		
Total	9	10.24185			

Table 45: Tukey test for Innovation Process

Grouping Information Using the Tukey Method and 95% Confidence				
Assessment Type_1	N	Mean	Grouping	
GSA	3	3.74333333	A	
Sustained	4	3.6275	A	
Challenge	3	1.70333333		B
Means that do not share a letter are significantly different.				

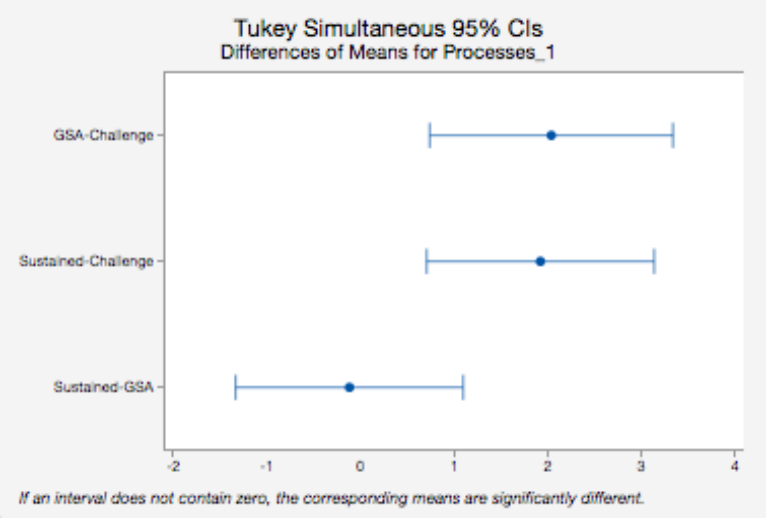

Figure 38: Tukey test different of means for Innovation Process

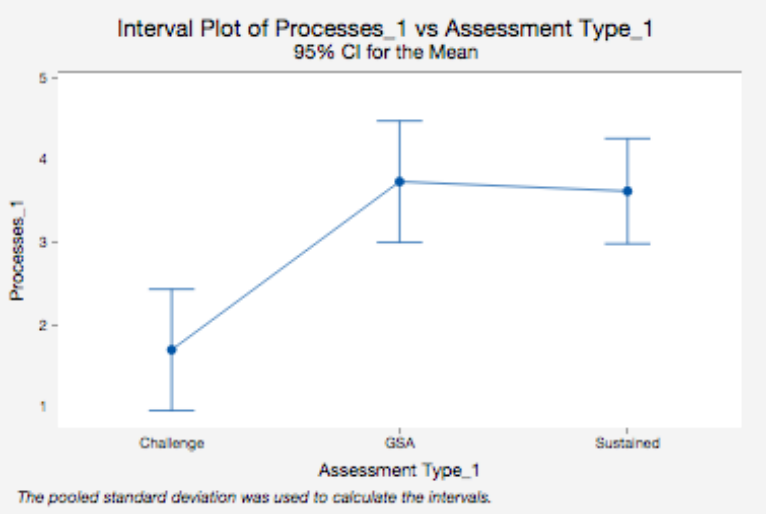

Figure 39: Interval plot of Innovation Process vs. assessment type

Innovation – Success

Innovation Success is the sixth building block of building innovation capabilities within organization. In the following section, the Baldrige performance excellence will be examined against organizations' Innovation success using regression analysis. Table 46 (Innovation Behavior vs. Performance excellence) show the innovation Behavior scores that were collected from the surveyed organizations and their performance excellence scores.

Table 46: Innovation Success vs. performance excellence

#	Assessment Type	Organization Code	Performance Score	Innovation Success
1	Challenge	SIC109	311	1.17
2	Challenge	SIC124	335	
3	Challenge	SIC114	351	2.22
4	Challenge	SIC123	375	
5	Challenge	SIC125	411	
6	Challenge	SIC117	443	2.44
7	Challenge	SIC126	575	
8	Challenge	SIC120	663	
9	GSA	SIC116	565	
10	GSA	SIC121	614	
11	GSA	SIC108	623	4.11
12	GSA	SIC111	635	
13	GSA	SIC118	663	
14	GSA	SIC103	673	
15	GSA	SIC107	716	4.53
16	GSA	SIC112	738	
17	GSA	SIC110	757	4.56
18	GSA	SIC115	772	
19	Sustained	SIC127	692	
20	Sustained	SIC104	751	4.28
21	Sustained	SIC102	763	3.85
22	Sustained	SIC122	779	
23	Sustained	SIC101	782	3.45
24	Sustained	SIC106	791	4.50

Correlation test: Pearson correlation of performance excellence score and Innovation Value score = 0.907, P-value= 0.0003

Based on the output of Pearson correlation of performance score and innovation's value, r= 0.904 which, indicates a high positive correlation between organization's Baldrige performance excellence and organization's innovation Behavior building block of the innovation model.

Table 47: Linear regression for innovation success vs. performance excellence

Analysis of Variance					
Source	**DF**	**Adj SS**	**Adj MS**	**F-Value**	**P-Value**
Regression	1	10.2761828	10.2761828	37.31	0.0003
Performance score_1	1	10.2761828	10.2761828	37.31	0.0003
Error	8	2.2035072	0.2754384		
Total	9	12.47969			
Model Summary					
S	**R-sq**	**R-sq(adj)**	**R-sq(pred)**		
0.524822254	82.34%	80.14%	71.42%		
Coefficients					
Term	**Coef**	**SE Coef**	**T-Value**	**P-Value**	**VIF**
Constant	-0.0564	0.6072	-0.09	0.9283	
Performance score	0.0056743	0.000929	6.11	0.0003	1
Regression Equation					
Success_1 = − 0.0564 + 0.0056743 Performance score_1					

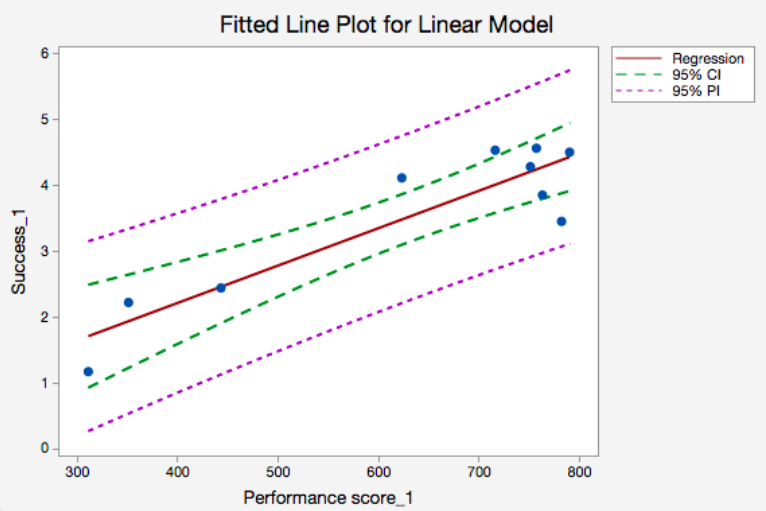

Figure 40: Fitted line plot for linear model

The P-value of the linear model is less than 0.05, however, when the test was done with quadratic and cubic regression models the P-values were more than 0.05, so The linear regression model is the best fit with R2 = 82.43% and S= 0.5248.

ANOVA analysis will be used here to test the means of Innovation Behavior scores output from the three performance excellence assessment programs in order to find which program (group) has a statistical difference.

Table 48: ANOVA test for Innovation Success

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Assessment Type_1	2	10.7800233	5.39001167	22.2	0.0009
Error	7	1.6996667	0.24280952		
Total	9	12.47969			

Table 49: Tukey method test for Innovation Success

Grouping Information Using the Tukey Method and 95% Confidence				
Assessment Type_1	N	Mean	Grouping	
GSA	3	4.4	A	
Sustained	4	4.02	A	
Challenge	3	1.94333333		B

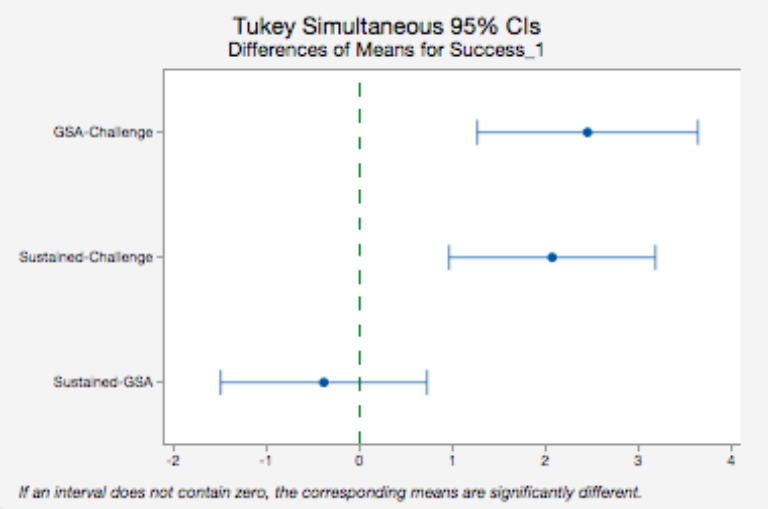

Figure 41: Tukey test different of means for Innovation Success

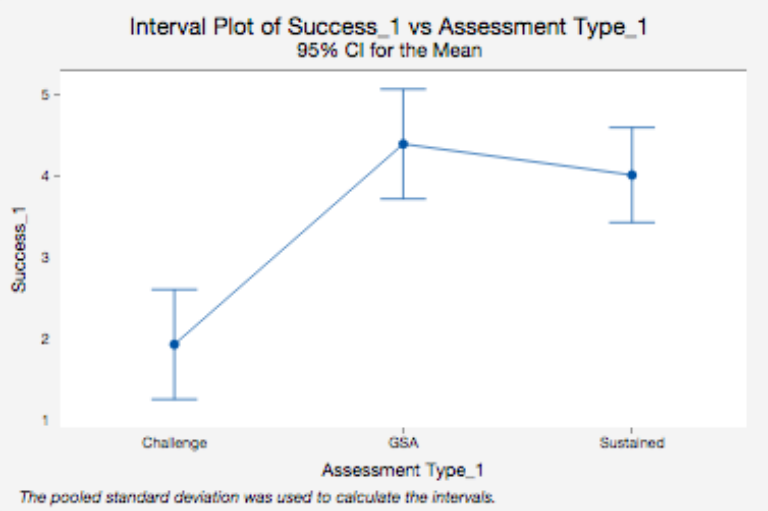

Figure 42: Interval plot of Innovation Success vs. assessment type

Innovation – Overall score

Innovation overall score is the aggregate of the six building blocks of innovation capabilities within the organization. At the beginning of this chapter, we analyzed the innovation overall score data using ANOVA methodology. We tested the overall innovation scores of the three performance excellence assessment groups; Challenge, GSA, and Sustained for difference in mean, Table 18 (innovation scores without outliers). The ANOVA output in Table 5 (ANOVA-Innovation Challenge, GSA, Sustain) confirmed a statistical difference among the three performance excellence groups innovation outputs. We also used ANOVA Tukey method for multiple comparisons to identify which pair of groups has a statistical difference Table 6 (Tukey method to compare pairs of means). The output of the Tukey method test confirmed that Challenge performance excellence assessment group has a lower statistical mean than GSA and Sustain performance excellence assessment groups that have no statistical difference in mean Figure 3 (Tukey 95% CI difference of means for innovation scores).

ANOVA analysis helps us identify the difference in output means between two groups of more, however, it does not tell us if a particular independent variable has a positive or negative or even an effect at all on the output. This is where we use regression analysis to test the relationship between performance excellence score level and innovation overall score

In the following section, the Baldrige performance excellence will be examined against organizations' Innovation overall score using regression analysis. Table 38 (Innovation overall score vs. Performance excellence) show the innovation Behavior scores that were collected from the surveyed organizations and their performance excellence scores.

Table 50: Innovation overall score vs. performance excellence

#	Assessment Type	Organization Code	Performance Score	Innovation Overall score
1	Challenge	SIC109	311	1.54
2	Challenge	SIC124	335	
3	Challenge	SIC114	351	1.72
4	Challenge	SIC123	375	
5	Challenge	SIC125	411	
6	Challenge	SIC117	443	2.76
7	Challenge	SIC126	575	
8	Challenge	SIC120	663	
9	GSA	SIC116	565	
10	GSA	SIC121	614	
11	GSA	SIC108	623	3.85
12	GSA	SIC111	635	
13	GSA	SIC118	663	
14	GSA	SIC103	673	
15	GSA	SIC107	716	4.28
16	GSA	SIC112	738	
17	GSA	SIC110	757	4.56
18	GSA	SIC115	772	
19	Sustained	SIC127	692	
20	Sustained	SIC104	751	3.96
21	Sustained	SIC102	763	4.05
22	Sustained	SIC122	779	
23	Sustained	SIC101	782	3.29
24	Sustained	SIC106	791	4.29

A quick correlation test using Pearson correlation of performance excellence score and overall innovation score provide us with P-value = 0.0002 and r= .917 which, indicates a high positive correlation between organization's Baldrige performance excellence score and organization's innovation overall score.

Table 51: Linear regression for innovation overall score vs. performance excellence

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	1	8.8628528	8.86285275	42.14	0.0002
Performance score	1	8.8628528	8.86285275	42.14	0.0002
Error	8	1.6825472	0.21031841		
Total	9	10.5454			

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
0.458604847	84.04%	82.05%	76.22%

Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	0.117	0.5306	0.22	0.831	
Performance score	0.0052696	0.0008118	6.49	0.0002	1

Regression Equation

Innovation overall score = 0.1170 + 0.0052696 Performance score

The P-value of the linear model equal 0.0002 which is less than 0.05, the model S= 0.4586 and R^2 = 84.04% which means that 84.04% of the variation in innovation capability of an organization is explained by the change in its performance excellence score.

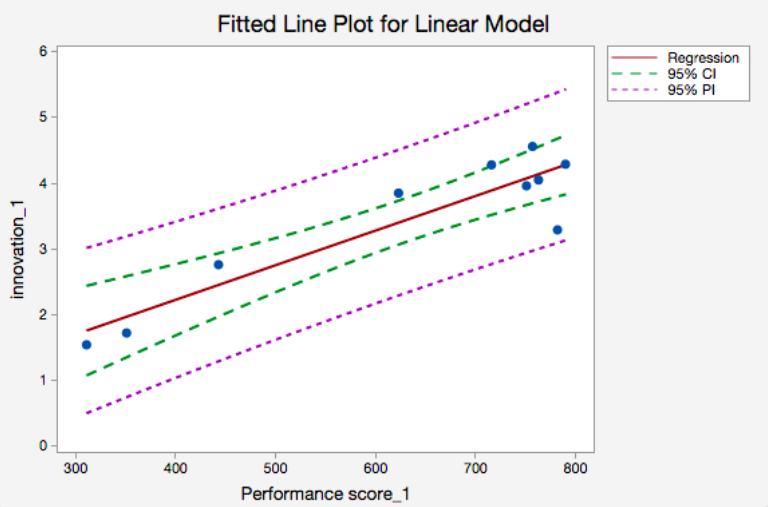

Figure 43: Fitted line plot for linear model

Figure 44 (overall innovation normal probability plot) shows the normality fit of the innovation data.

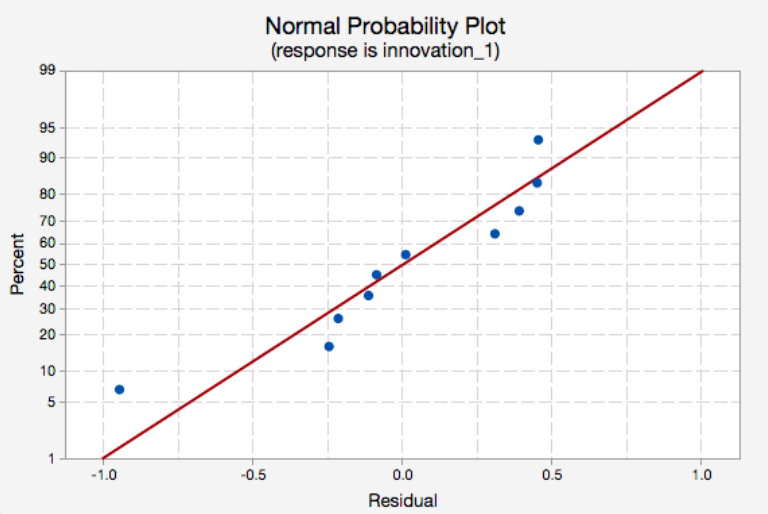

Figure 44: Overall innovation normal probability plot

Anderson Darling normality method was used to test the normality of the collected data Table 40 (innovation overall score normality test). The P-value equal 0.0678, this means that the

null hypothesis (H0: data follow a normal distribution) can't be rejected. Even though this is a good output for our test, however, we still can not confirm that the collected data is normal. We can say that the data is not following a non normal distribution, Figure 45 (Anderson darling normal probability plot).

Table 52: innovation overall score normality test

Descriptive Statistics		
N	Mean	StDev
10	3.43	1.0825
Anderson-Darling Test		
Null hypothesis	Ho: Data follow a normal distribution	
Alternative hypothesis	H1: Data do not follow a normal distribution	
AD-Value	**P-Value**	
0.64	0.0678	

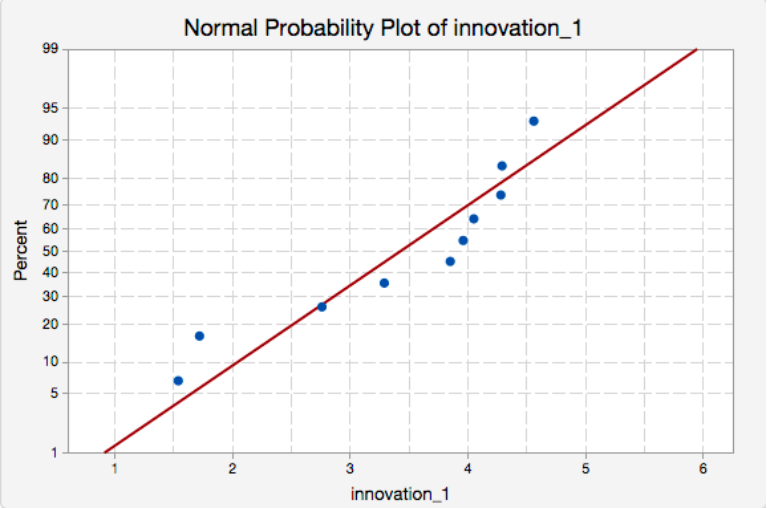

Figure 45: Anderson darling normal probability plot

CHAPTER FIVE: DISCUSSION

In this chapter, we will discuss the output and results from the previous chapter. In this research, we collected/measured two types of data for twenty-four organizations. All the organizations that participated in this research are using Baldrige performance excellence program to improve their overall performance. The two types of data that were used in this research are; Performance excellence score and Innovation capability score.

The performance excellence score was measured for each organization and it consists of two measures: Process score and Results score. The innovation score was also measured for each organization and it consists of six innovation building blocks: Innovation value, innovation behaviour, innovation climate, innovation resources, innovation process, and innovation success.

The objective of this research is to measure the effect of Baldrige performance excellence program on organization's innovation capabilities. So we measured the effect of the performance excellence score level on each of the six innovation building blocks and the overall innovation score.

In the following section we will discuss the research main hypothesis to answer the main question of this study, using the result of the data analysis for the overall innovation score. We will also discuss the research sub-hypothesis to answer the six sub-questions we have in this study, using the results of the data analysis for each of innovation building block.

Performance excellence improvement

Before discussing the research main objective results, this study presents an important finding, which is the confirmation of the positive effect of Baldrige performance excellence program on organizations overall performance. Performance excellence scores were measured /collected for twenty-four organizations that implemented one of the three types of Florida Sterling performance excellence assessment programs; Challenge, GSA, Sustain.

Remember, Challenge assessment program is designed for new organizations that have no experience with Baldrige program and are in the process of starting their performance excellence journey. GSA assessment program is designed for more experienced organizations that mostly went through the Challenge assessment in the past three years and want to further improve their performance using intensive assessment program. Sustain assessment is for mature organizations that have done the intensive GSA assessment over the past three years and looking forward to sustain and keep up with the continuous improvement system in the organization.

Based on ANOVA test that was used in this research, seven organizations conducted the challenge performance excellence assessment, ten organizations conducted the GSA performance excellence assessment, and six organizations conducted the Sustain performance excellence assessment. The results confirm that as the organization go through the different assessment program; the performance excellence score of the organization gets improved. Figure 46 (Performance Scores Box Plot) shows a positive trend in performance excellence among the three assessment programs' groups.

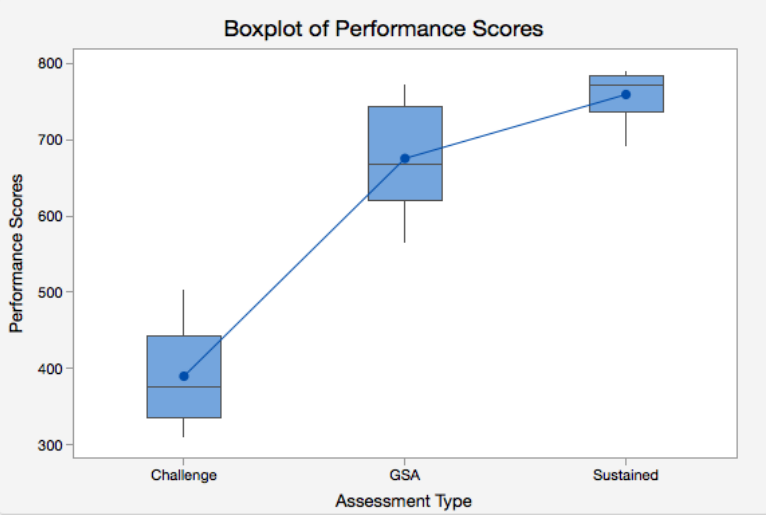

Figure 46: Performance Scores Box Plot

Research questions and results

In this section, we will present the results of each of the six sub-questions and the main question of this study and discuss these results accordingly. The research model that was introduced in chapter one Figure 2.0 (Research Model) presents the following research questions and hypothesis:

Main question: What is the effect of Baldrige (Sterling) assessment framework on Organization's innovation/dynamic capabilities?

Main Hypothesis: Baldrige assessment framework has a positive impact on Organization's innovation/dynamic capabilities.

To answer the research main question, further sub-questions and hypothesises have been developed, each sub-question addresses each one of six innovation building blocks that represent a foundation for organization's innovation capabilities.

Sub-question 1: What is the effect of Baldrige assessment framework on Organization's value for innovation?

Hypothesis, H1: Baldrige assessment framework has a positive impact on Organization's value for innovation.

Sub-question 2: What is the effect of Baldrige assessment framework on Organization's behaviour regarding innovation?

Hypothesis, H2: Baldrige assessment framework has a positive impact on Organization's behaviour regarding innovation.

Sub-question 3: What is the effect of Baldrige assessment framework on Organization's innovation culture?

Hypothesis, H3: Baldrige assessment framework has a positive impact on Organization's innovation culture.

Sub-question 4: What is the effect of Baldrige assessment framework on Organization's innovation's resources?

Hypothesis, H4: Baldrige assessment framework has a positive impact on Organization's innovation's resources.

Sub-question 5: What is the effect of Baldrige assessment framework on Organization's innovation's processes?

Hypothesis, H5: Baldrige assessment framework has a positive impact on Organization's innovation processes.

Sub-question 6: What is the effect of Baldrige assessment framework on Organization's innovation measurement?

Hypothesis, H6: Baldrige assessment framework has a positive impact on Organization's innovation's measurement.

Final Research Model results

Based on the analysed data, we can confirm that Baldrige performance excellence framework has a positive effect on Organizations' innovation capabilities, Figure 47 (research model results) shows a visual result of the main and sub-hypothesis we started this research with.

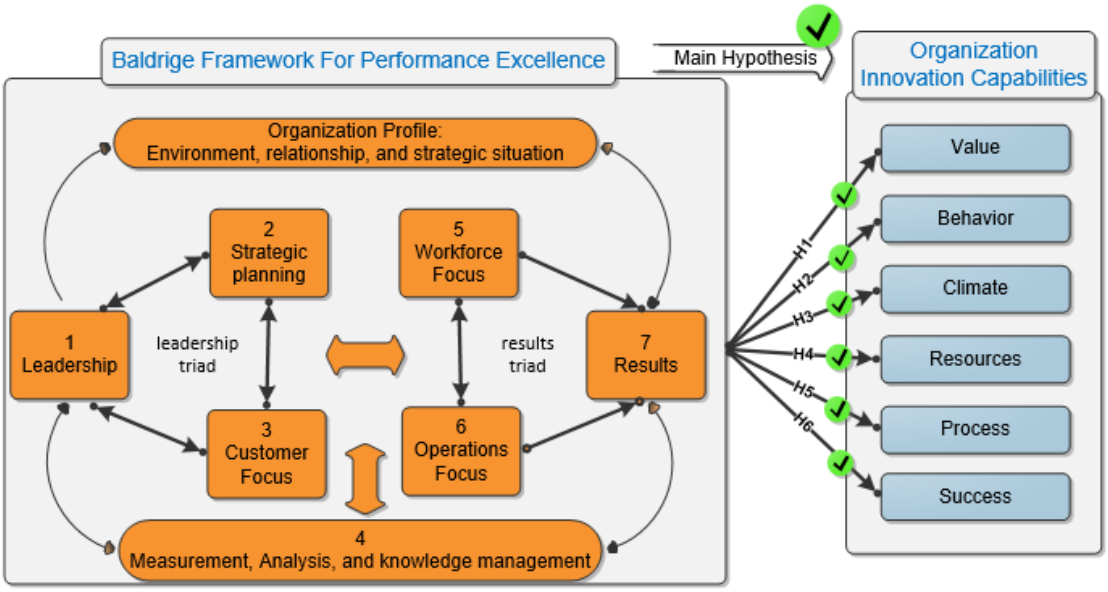

Figure 47: Research Model Results

Notice that Baldrige performance excellence also has a positive effect on all the six innovation building blocks. In the following section, we will discuss each innovation building block and the relationship between Baldrige performance excellence program and that sub component.

Performance excellence effect on Innovation's value

Innovation value is first building block of the innovation model we used in this research. The first sub-question and hypothesis presented in this research are as follow:

Sub-question 1: What is the effect of Baldrige assessment framework on Organization's value for innovation?

Hypothesis, H1: Baldrige assessment framework has a positive impact on Organization's value for innovation.

In this research we found that Baldrige performance excellence has a positive effect on organizations' leaders' innovations' Value. This means that as organizations go through the performance excellence program and increase their performance excellence, organizations' leaders will increase their value for innovation.

Based on the regression analysis that was conducted in this research, Innovation value is correlated with Performance excellence as demonstrated in equation 1.

$$Innovation\ Value = -4.331 + 0.0239\ PEx - 0.000016\ PEx^2 \quad (1)$$

The model P-value was less than 0.05 and $R^2 = 93.44\%$, which mean that 93.44% of the increase in organizations' innovation value is explained by changes in performance excellence level of the organization.

Furthermore, ANOVA test with P-value less than 0.05 confirmed that the leaders of the organizations that go through Sterling GSA and Sustain performance excellence assessment programs have higher innovation Value scores than those leaders of the organizations that are

new to Baldrige and are going through the Sterling Challenge performance excellence assessment program. Figure 48 (Sterling assessment type on Innovation Value) show that organizations doing Challenge assessment program has lower innovation Value than organizations that are doing GSA and Sustain programs.

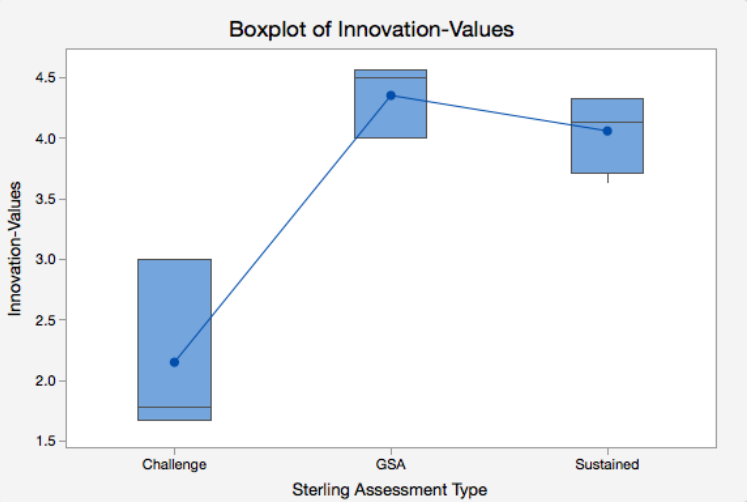

Figure 48: Sterling Assessment type on Innovation Value

Performance excellence effect on Innovation's behavior

Innovation Behavior is the second building block of the innovation model we used in this research. The second sub-question and hypothesis presented in this research are as follow:

Sub-question 2: What is the effect of Baldrige assessment framework on Organization's behaviour regarding innovation?

Hypothesis, H2: Baldrige assessment framework has a positive impact on Organization's behaviour regarding innovation.

In our research we found that Baldrige performance excellence has a positive effect on organizations' leaders' innovations' Behaviour. This means that as organizations go through the performance excellence program and increase their performance excellence, organizations' leaders' innovation behaviour will be improved.

Based on the regression analysis that was conducted in this research, Innovation Behavior is correlated with Performance excellence as demonstrated in equation 2.

$$Innovation\ Behavior = -7.421 + 0.0364\ PEx - 0.000028\ PEx^2 \qquad (2)$$

The model P-value was less than 0.05 and $R^2 = 93.95\%$, which mean that 93.95% of the increase in organizations' innovation Behavior is explained by changes in performance excellence level of the organization.

Furthermore, ANOVA test with P-value less than 0.05 confirmed that the leaders of the organizations that go through Sterling GSA and Sustain performance excellence assessment programs have higher innovation Behaviour scores than those leaders of the organizations that

are new to Baldrige and are going through the Sterling Challenge performance excellence assessment program. Figure 49 (Sterling assessment type on Innovation Behavior) show that the leaders of organizations that are new or doing Challenge assessment program has lower innovation Behavior than those leaders of organizations that are doing GSA and Sustain programs.

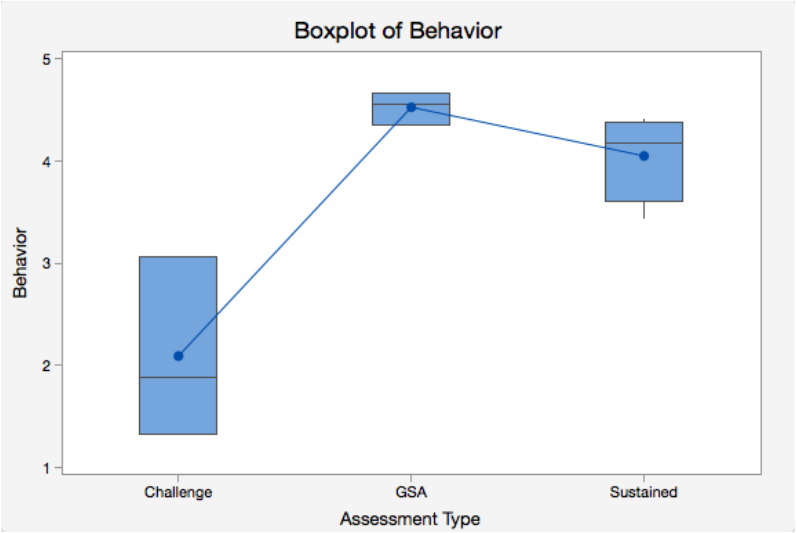

Figure 49: Sterling assessment type on Innovation Behavior

Performance excellence effect on Innovation's climate/Culture

Innovation Climate/culture is the third building block of the innovation model we used in this research. The third sub-question and hypothesis presented in this research are as follow:

Sub-question 3: What is the effect of Baldrige assessment framework on Organization's innovation culture?

Hypothesis, H3: Baldrige assessment framework has a positive impact on Organization's innovation culture.

In this research, we found that Baldrige performance excellence has a positive effect on organizations' innovations' Culture/Climate. This means that as the organizations go through the performance excellence program and increase their performance excellence, organizations' innovation Culture will be improved.

Based on the regression analysis that was conducted in this research, Innovation Climate is correlated with Performance excellence as demonstrated in equation 3.

$$Innovation\ Climate = -7.568 + 0.0367\ PEx - 0.000028\ PEx^2 \quad (3)$$

The model P-value was less than 0.05 and $R^2 = 88.54\%$, which mean that 88.54% of the increase in organizations' innovation Climate is explained by changes in performance excellence level of the organization.

Furthermore, ANOVA test with P-value less than 0.05 confirmed that the organizations that go through Sterling GSA and Sustain performance excellence assessment programs have higher innovation Climate scores than those organizations that are new to Baldrige and are going

through the Sterling Challenge performance excellence assessment program. Figure 50 (Sterling assessment type on Innovation Climate) show that organizations doing Challenge assessment program has lower innovation Climate than organizations that are doing GSA and Sustain programs.

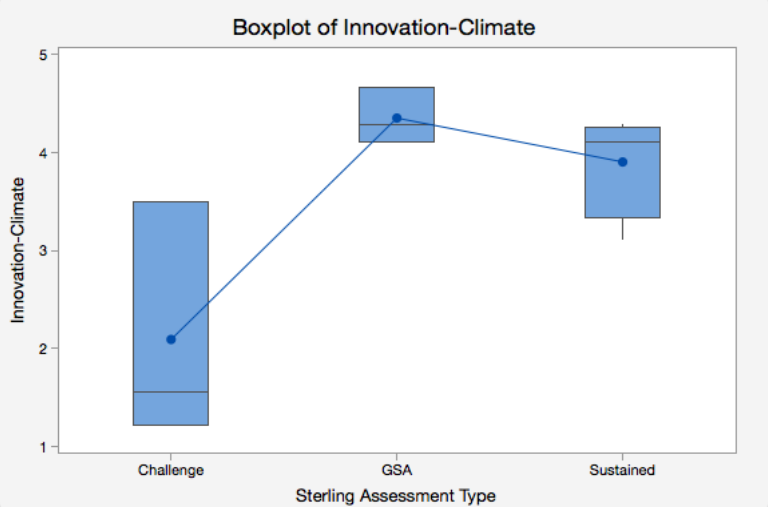

Figure 50: Sterling Assessment type on Innovation Climate

Performance excellence effect on Innovation's resources

Innovation Resources is the fourth building block of the innovation model we used in this research. The fourth sub-question and hypothesis presented in this research are as follow:

Sub-question 4: What is the effect of Baldrige assessment framework on Organization's innovation's resources?

Hypothesis, H4: Baldrige assessment framework has a positive impact on Organization's innovation's resources.

In our research we found that Baldrige performance excellence has a positive effect on organizations' innovations' Resources. This means that as organizations go through the performance excellence program and increase their performance excellence, organizations will invest more resources into innovation. Based on the regression analysis that was conducted in this research, Innovation Resources is correlated with Performance excellence as demonstrated in equation 4.

$$Innovation\ Resources = 0.4117 + 0.0046\ PEx \quad (4)$$

The model P-value was less than 0.05 and $R^2 = 71.22\%$, which mean that 71.22% of the increase in organizations' innovation Resources is explained by changes in performance excellence level of the organization.

Furthermore, ANOVA test with P-value less than 0.05 confirmed that the organizations that go through Sterling GSA and Sustain performance excellence assessment programs put more resources into innovation than those organizations that are new to Baldrige and are going through

the Sterling Challenge performance excellence assessment program. Figure 51 (Sterling assessment type on Innovation Resources) show that organizations doing Challenge assessment program use less innovation Resources than organizations that are doing GSA and Sustain programs.

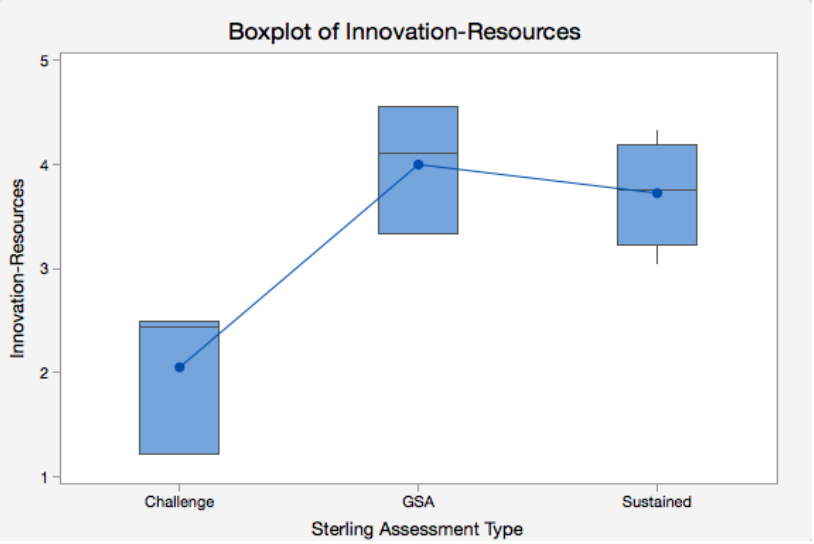

Figure 51: Sterling Assessment type on Innovation Resources

Performance excellence effect on Innovation's Process

Innovation Process is the Fifth building block of the innovation model we used in this research. The fifth sub-question and hypothesis presented in this research are as follow:

Sub-question 5: What is the effect of Baldrige assessment framework on Organization's innovation's processes?

Hypothesis, H5: Baldrige assessment framework has a positive impact on Organization's innovation processes.

In our research we found that Baldrige performance excellence has a positive effect on organizations' innovations' Process. This means that as organizations go through the performance excellence program and increase their performance excellence, organizations' innovation Process will be improved.

Based on the regression analysis that was conducted in this research, Innovation Process is correlated with Performance excellence as demonstrated in equation 5.

$$Innovation\ Process = -0.235 + 0.0053\ PEx \quad (5)$$

The model P-value was less than 0.05 and $R^2 = 86.91\%$, which mean that 86.91% of the increase in organizations' innovation Resources is explained by changes in performance excellence level of the organization.

Furthermore, ANOVA test with P-value less than 0.05 confirmed that the organizations that go through Sterling GSA and Sustain performance excellence assessment programs have higher innovation Process scores than those organizations that are new to Baldrige and are going

through the Sterling Challenge performance excellence assessment program. Figure 52 (Sterling assessment type on Innovation Climate) show that organizations doing Challenge assessment program has lower innovation Process score than organizations that are doing GSA and Sustain programs.

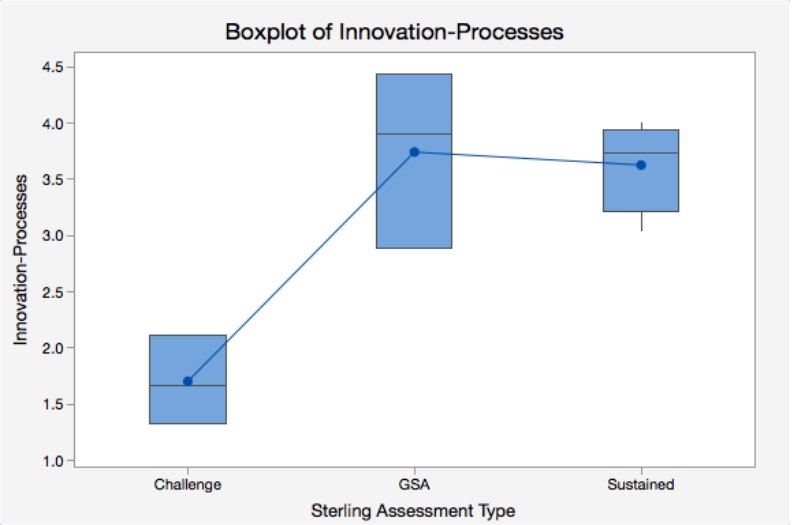

Figure 52: Sterling Assessment type on Innovation Process

Performance excellence effect on Innovation's success measurement

Innovation Success measurement is the sixed building block of the innovation model we used in this research. The third sub-question and hypothesis presented in this research are as follow:

Sub-question 6: What is the effect of Baldrige assessment framework on Organization's innovation Success?

Hypothesis, H6: Baldrige assessment framework has a positive impact on Organization's innovation's Success.

In our research we found that Baldrige performance excellence has a positive effect on organizations' innovations' Success measurements. This means that as organizations go through the performance excellence program and increase their performance excellence based on Baldrige framework, the organizations' innovation Success measurement will be improved. Based on the regression analysis that was conducted in this research, Innovation Success is correlated with Performance excellence as demonstrated in equation 6.

$$Innovation\ Success = -0.0564 + 0.0057\ PEx \quad (6)$$

The model P-value was less than 0.05 and $R^2 = 82.34\%$, which mean that 82.34% of the increase in organizations' innovation Success is explained by changes in performance excellence level of the organization.

Furthermore, ANOVA test with P-value less than 0.05 confirmed that the organizations that go through Sterling GSA and Sustain performance excellence assessment programs have

higher innovation Success scores than those organizations that are new to Baldrige and are going through the Sterling Challenge performance excellence assessment program. Figure 53 (Sterling assessment type on Innovation Success) show that organizations doing Challenge assessment program has lower innovation Success score than organizations that are doing GSA and Sustain programs.

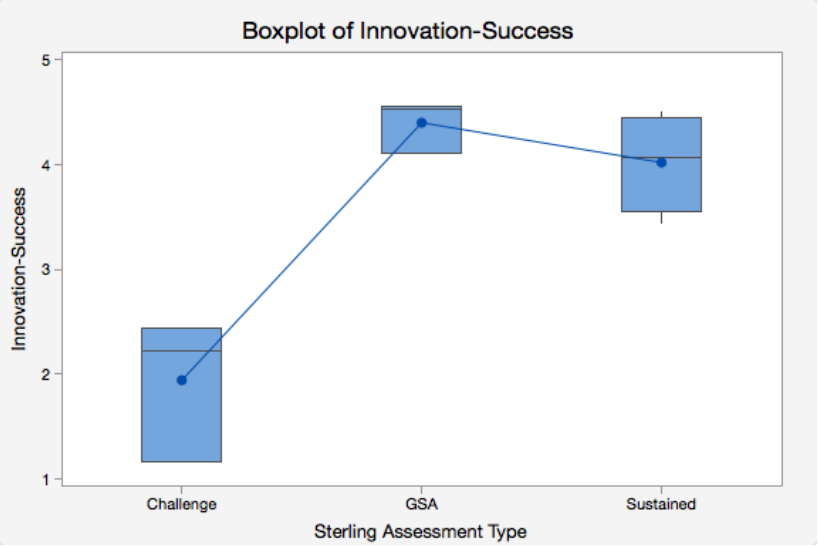

Figure 53: Sterling Assessment type on Innovation Success

Performance excellence effect on overall Innovation capabilities

Overall Innovation capabilities score is the average score of the six building blocks of the innovation model we used in this research. The main question and hypothesis presented in this research are as follow:

Main question: What is the effect of Baldrige (Sterling) assessment framework on Organization's innovation/dynamic capabilities?

Main Hypothesis: Baldrige assessment framework has a positive impact on Organization's innovation/dynamic capabilities.

The overall innovation capabilities score is calculated based on the average of the six innovations' building blocks; innovation Value, innovation behaviour, innovation culture/Climate, innovation resources, innovation processes, and innovation success. Each building block addresses three factors, and each factor consists of three elements. A total of 54 questions are used to assess an organization's innovation capabilities scores. This reflects a 360 assessment to innovation within the organization.

In our research we found that Baldrige performance excellence has a positive effect on the organizations' overall innovation's capabilities. This means that as the organizations increase their performance excellence based on Baldrige framework, the organizations' overall innovation capabilities will be improved.

Based on the regression analysis, organizations' Innovation's capabilities is correlated with Performance excellence as demonstrated in equation 7.

$$Innovation\ \ Capabilities = 0.117 + 0.00527\ PEx \qquad (7)$$

The model P-value was less than 0.05 and R^2 = 84.04%, which mean that 84.04% of the increase in organizations' innovation Overall capabilities is explained by changes in performance excellence level of the organization.

Furthermore, ANOVA test with P-value less than 0.05 confirmed that the organizations that go through Sterling GSA and Sustain performance excellence assessment programs have higher innovation overall scores than those organizations that are new to Baldrige and are going through the Sterling Challenge performance excellence assessment program. Figure 54 (Sterling assessment type on Innovation overall) show that organizations doing Challenge assessment program has lower innovation Capabilities score than those of organizations that are doing GSA and Sustain programs.

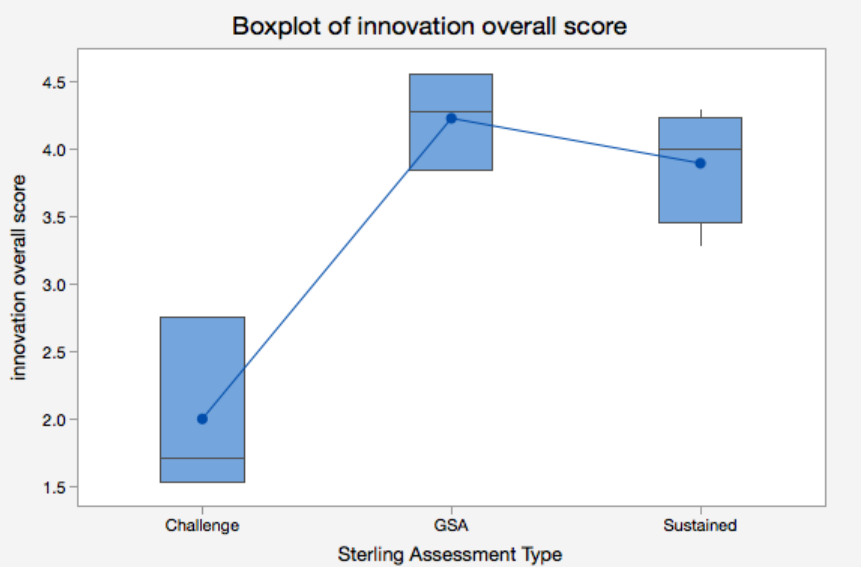

Figure 54: Sterling Assessment type on Overall Innovation score

CHAPTER SIX: SUMMARY & CONCLUSIONS

Building innovation and Dynamic capabilities within an organization requires good understanding and strong believes by leaders in innovation. Those leaders not only need to talk about and discuss innovation in their meetings, but they also need to show that they truly value innovation through their behaviors and actions. Leaders' values for innovation are reflected in how much of their personal time are dedicated for innovation and are reflected in how much dollar they spend in innovation projects and efforts.

To instill innovation within organizations, leaders have to make innovation part of the organization strategy for success. Financial measures should be in place to track revenue from new innovative products and services that have been developed in the last three years for example. Customers' feedback and satisfaction with the organization's innovation projects should be measured and tracked. Continuous improvement to innovation process is critical to increase productivity and efficiency through reducing cycle time and failures. Finally, leaders should promote creativity, continuous learning and experimentation with new ideas and solutions to create a culture of entrepreneurship within the organization.

The more value put into innovation, the more impact the leaders will have on people's behavior within the organization. Innovation behavior is manifested in how leaders and employees react towards cannibalizing existing products in favor of new ones. Modeling the right behavior by leaders translate values into actions that inspire and encourage middle management and employees to take initiatives, overcome obstacles and continue experimenting

with creative ideas. Leaders' behaviors toward innovation is also reflected in influencing, coaching, and supporting employees' creative ideas and innovation efforts.

A culture of innovation is required within the organization in order to create a safe, learning, and fun environment for employees to search for new opportunities that can be further tested and then converted into new products, services or business model. Leaders are directly and solely responsible for building this culture within the organization, Leaders must provide required resources such as time, money and space for employees to become creative and innovate. Sharing internal knowledge and providing access to experts and external information help employees overcome obstacles and continue their innovation efforts.

Once leaders put value in innovation and reflect this in action through providing required resources and creating a culture that nurture creativity and encourage innovation, then a systematic process for innovation is required to guide and help employees focus on real opportunities, test and validate their ideas, then experiment with the solutions and get customers feedback to further tune and improve the output. Most importantly, kill unworkable ideas as early as possible to avoid waste and increase efficiency in developing innovation. A clear process for innovation not only will help employees understand the steps they need to take to test and validate their ideas, but also help middle management and leaders support the outcome of the process and provide the means to further develop and market the solution.

Finally, in order to build the required innovation capabilities and continue improving it, then hard evidence of the efforts and results must be presented; this is where measurement of the innovation efforts should take place at different points of the process. Collecting data on the

organization's innovation input, innovation process and innovation output will help organizations further tune and improve innovation capabilities.

It takes huge efforts and time for leaders to develop the required innovation capabilities within their organizations. The problem is in the absence of a clear framework that can help the organization takes the right steps in building the required capabilities. Sometime organizations lack the proper ordinary/operational capabilities that enable them to perform their current on-going activities using existing skills and techniques to maintain the status quo of the business, good operational capabilities enable organizations perform current activities efficiently and effectively.

Without these basic (ordinary/operational) capabilities in place, it's hard for organizations to develop the required advanced capabilities (Dynamic/innovative) for innovation. Proper Leadership, good strategy development and implementation, Deep understanding of customers needs, process management and improvement, ability to acquire talents and empower them, and ability to measure and develop a knowledge management system, all these basic capabilities are crucial for any business to maintain good performance. Having these basic capabilities in place will save organizations time and money to invest in developing the required advance capabilities (Dynamic/innovation) for innovation.

These basic capabilities will also provide the support required for continues innovation. The more you know your customers the more you can develop innovative solutions for them, the more you know your employees the more you can utilize their skills, knowledge and creative ideas, the more you know and continue improve your processes the more innovation can be

introduced internally, the more you know how to measure and track your performance the more efficient the organization will be in innovation.

This dissertation study suggests using Baldrige performance excellence program to help organizations systematically develop the advanced (innovation/dynamic) capabilities that is required for innovation.

Baldrige Performance Excellence program consist of a set of assessment criteria that provides guidance and vehicle for organizational change. Baldrige program help senior management develop internal improvement system that can be used to target the various organization's systems and processes. Organizations use this integrated framework to improve their Basic (Ordinary/operational) capabilities to become more efficient and effective. The new updated criteria contain innovation related questions that can help organizations' leaders systematically assess current innovation performance and develop the required advanced (dynamic/innovation) capabilities to improve this performance.

In this research, Twenty-four organizations, that implemented Baldrige Performance Excellence program, were studied to measure the effect of Baldrige implementation on the organizations' innovation/dynamic capabilities. Two types of data measurements were calculated/collected from the organizations: Performance excellence scores and Innovation capabilities scores.

These twenty-four organizations worked with Florida Sterling Council, the approved local state version of the US National Malcolm Baldrige Quality Award program, to implement the Baldrige performance excellence program.

Florida Sterling Council developed several performance excellence assessment programs based on Baldrige criteria to help organizations in various stages of their performance journey. Three specific assessment programs were utilized by the twenty-four participating organizations. These assessment programs are: Sterling Challenge, Sterling GSA, and Sterling Sustained.

Sterling Challenge assessment program is used by new organizations that are new to Baldrige performance excellence criteria; eight organizations of the twenty-four were participating in Sterling Challenge assessment program. Sterling GSA assessment program is used by mature organizations that are familiar with Baldrige performance excellence criteria; ten organizations of the twenty-four were participating in Sterling GSA assessment program. Sterling Sustain assessment program is used by more mature organizations that went through GSA assessment before and are fully familiar with Baldrige performance excellence criteria; six organizations of the twenty-four were participating in Sterling Sustained assessment program.

In this research, each assessment program was treated as a separate group with the Challenge assessment program being the control group. ANOVA analysis was used to compare the mean performance scores of the three different performance excellence assessment programs. The outcome shows a statistical difference among the three groups, which proof that implementing Baldrige performance excellence program does improve organization performance excellence. This improvement targets the basic (operational/ordinary) capabilities that are needed for effective and efficient operation.

Further to the calculated performance excellence scores for each of the twenty-four organizations, the innovation capabilities of these organizations were also measured through an

online survey. Eleven organizations completed the survey, four from the challenge group, three from the GSA group and four from the Sustained group. The survey examines six foundational building blocks for innovation capabilities: Innovation-value, Innovation-Behavior, Innovation-Culture, Innovation-Resources, Innovation-Process, and Innovation Success. Each of the six innovation building block consist of three factors and each factor consist of three elements for a total of fifty-four questions included in this survey.

ANOVA statistical analysis was used to assess the difference of mean innovation capability score among the three assessment groups with the Challenge group being the control group. The outcome shows a statistical difference among the three groups, which proof that implementing Baldrige performance excellence positively impact organization Advanced (innovation/dynamic) capabilities.

Finally, regression analysis was used to measure the correlation between the organizations' performance excellence levels and the different innovation capabilities building blocks including the overall innovation capability level. This help us further understand the impact of Baldrige Excellence framework on the different innovation capabilities. The outcome shows that all six sub-hypotheses were supported and that Baldrige Excellence framework has a positive impact on all the six-innovation building blocks.

Key Findings

Several key findings were reached in this dissertation study that went beyond the scope of this research, which was focusing on measuring the effect of Baldrige performance excellence program on Organizations' dynamic/innovation capabilities. These findings can be summarized as follow:

Key Finding 1: This dissertation research studied the effect of Baldrige performance excellence on leaders' value for innovation. The outcome confirmed that as an organization continue utilize the Baldrige framework to improve its performance excellence, the leaders' value for innovation in this organization increases. When the leaders have strong value for innovation they will focus more on building the required capabilities within their organizations to become innovative.

Key Finding 2: This dissertation research studied the effect of implementing Baldrige performance excellence on leaders' behavior when it comes to innovation. The outcome confirmed that as an organization continue utilize the Baldrige framework to improve its performance excellence, the behavior of those leaders improves from being risk avoidance to become more accommodating to risk and uncertainty that accompanies innovation efforts.

Key Finding 3: This dissertation research studied the effect of implementing Baldrige performance excellence on organization's innovation culture. The outcome confirmed that as the organization continue utilize the Baldrige framework to improve its performance excellence, the organization will have better culture for innovation. Since the leaders of high performing organizations have more appreciation for innovation and show positive attitude and behavior

towards risks and uncertainties, they will build a safe environment that nurture the entrepreneurial culture within the organization to help employees take actions, continue learning, and experimenting with creative ideas.

Key Finding 4: This dissertation research studied the effect of implementing Baldrige performance excellence on organization's innovation resources. The outcome confirmed that as the organization continue utilize the Baldrige framework to improve its performance excellence, the organization will invest more resources into innovation efforts. The effect of more value, positive behavior, and better Culture for innovation is reflected on the how leaders invest time and money in innovation. This will improve how the organization invest in innovation and hence increase its capabilities in Innovation.

Key Finding 5: This dissertation research studied the effect of implementing Baldrige performance excellence on organization's innovation process. The outcome confirmed that as the organization continue utilize the Baldrige framework to improve its internal processes, the organization will develop and continue improve its process for innovation. In fact, the ADLI (Approach, Deploy, Learning, and Integration) four-dimensional assessment model that is part of Baldrige performance excellence assessment program will help in ensuring that the innovation process is fully deployed across the organization and fully integrated with the organization goals and objectives.

Key Finding 6: This dissertation research studied the effect of implementing Baldrige performance excellence on organization's innovation success measurement. The outcome confirmed that as the organization continue utilize the Baldrige framework to improve its

measurement system and results, the organization will have better understanding for innovation outcomes throughout the process and will continue measure its innovation efforts for tuning, feedback and alignment. Baldrige uses LeTCI four-dimensional assessment model to measure results will improve how organizations measure their innovation success and benchmark with leaders in the market.

Key Finding 7: The study also concludes that Baldrige performance excellence does improve the organizations advanced (dynamic/innovation) capabilities. Organizations innovation capabilities were assessed at six areas with the focus on leaders' ability to lead innovation efforts, also their ability to create the required culture to nurture creative ideas and support employees with required resources. In this research, organizations with higher performance excellence scores have higher innovation capabilities measure in all six-innovation building blocks based on the assessed survey. This means that the more the organizations focus on implementing Baldrige performance excellence program and improve their performance, the more capacity "Innovation/dynamic capability" will be developed within these organizations to innovate.

Key Finding 8: this research study confirmed that implementing Baldrige performance excellence framework does help improve organizations overall performance. The higher performance is a direct outcome of improving internal processes and systems and increasing alignment throughout the organization, which is also reflected on the organization's results. Organization that implemented Baldrige performance excellence will have higher capacity to perform day-to-day work more effectively and efficiently. As mentioned in the literature review,

the capacity to do day-to-day work with existing skills and techniques is defined as operational/ordinary capability, which I defined here as the basic capabilities. This dissertation study confirmed that Implementing Baldrige performance excellence does improve organization's Basic (operational/ordinary) capabilities. This key finding supports pervious scholars studies that confirms the benefits of implementing Baldrige Excellence Framework. Most of the studies focused mainly on financial and market outcome from implementing Baldrige, In this research the focus was on the performance excellence improvement, which covers the organization processes and their results, financial results is one outcome of many other outcomes assessed in Baldrige.

With all these key findings, we can conclude that implementing Baldrige performance excellence program as a framework not only will improve organizations' basic (operational/ordinary) capabilities to become more efficient and effective in using its resources, but it will also help the organizations develop the required advanced (innovation/dynamic) capabilities systematically and continue improving these capabilities to stay innovative.

Future work

This is a cross sectional study with twenty-four organizations participating in the research. Perhaps a longitudinal study over the cycle of the performance excellence journey is needed to focus on each innovation building block and develop continues measures for the effect of Baldrige performance excellence program on organization's dynamic/innovation capabilities. A future work could also focus on developing an innovation performance measurement within

the Baldrige Excellence Framework. Which will help organizations better understand and focus on innovation when their innovation performance is translated into numbers.

APPENDIX A: INNOVATION SURVEY QUESTIONNAIRES

Building Blocks	Factors	Element	SURVEY QUESTIONS	Elements Score	Factor Average	Block average
Values	Entrepreneurship	Hunger	We have a strong desire to explore opportunities and to create new things			
		Ambiguity	We have a healthy appetite and tolerance for ambiguity when pursuing new opportunities			
		Action Orientated	We avoid analysis paralysis when we identify new opportunities by exhibiting a bias towards			
	Creativity	Imagination	We encourage new ways of thinking and solutions from diverse perspectives			
		Autonomy	Our leaders provide us with the freedom to pursue new opportunities			
		Playful	We take delight in being spontaneous and are not afraid to enjoy ourselves			
	Learning	Curiosity	We are good at asking questions in the pursuit of the unknown			
		Experiment	We are constantly experimenting in our innovation efforts			
		Failure	We are not afraid to fail and we treat failure as a learning opportunity.			
Behaviors	Energy	Inspire	Our leaders inspire us with a vision for the future and concisely articulate the opportunities for the			
		Challenge	Our leaders frequently challenge us to think and act entrepreneurially.			
		Model	Our leaders model the right innovation behaviors for others to follow.			
	Engagement	Coach	Our leaders devote time to coach and provide feedback on our innovation efforts.			
		Initiative	In our organization people at all levels proactively take the initiative to innovate.			
		Support	Our leaders provide support to project team members during both successes and failures.			
	Enablement	Influence	Our leaders use appropriate influence strategies to help us navigate around organizational			
		Adapt	Our leaders are able to modify and change course of action when needed.			
		Grit	Our leaders persist in following opportunities even in the face of adversity.			
Climate	Collaboration	Community	We have a community that speaks a common language about innovation.			
		Diversity	We appreciate, respect and leverage the differences that exist within our community.			
		Teamwork	We work well together in teams to capture opportunities.			
	Safety	Trust	We are consistent in actually doing the things that we say we value.			
		Integrity	We question decisions and actions that are inconsistent with our values.			
		Openness	We are free to voice our opinions about unconventional and controversial ideas			
	Simplicity	No Bureaucracy	We simplify our workplace by minimizing rules, policies and bureaucracy			
		Accountability	People take responsibility for their own actions and avoid blaming others.			
		Decision Making	Our people know exactly how to get started and move initiatives through the organization.			
Resources	Talent	Champions	Our leaders are committed and champion innovation			
		Experts	We have access to innovation experts who can support our projects.			
		Talent	We have the internal talent to succeed in our innovation projects.			
	Systems	Selection	We have the right recruiting strategy in place to support a culture of innovation			
		Communication	Our collaboration tools effectively support our innovation efforts			
		Ecosystem	We are good at leveraging our relationships with suppliers and vendors to pursue innovation			
	Programs	Time	We give people dedicated time to pursue new opportunities			
		Money	We have dedicated finances to pursue new opportunities			
		Space	We have the right amount of quality space to pursue new opportunities			
Processes	Ideation	Generate	We generate ideas from a vast and diverse set of sources			
		Filter	We filter and refine ideas to identify the most promising opportunities.			
		Priorities	We select opportunities based on a clearly articulated risk portfolio			
	Testing	Prototype	We move promising opportunities quickly into prototyping			
		Iterate	We have effective feedback loops between our organization and the voice of the customer			
		Fail Smart	We can fail quickly and stop projects based on predefined failure criteria			
	Speed	Flexibility	Our processes are tailored to be flexible and context based rather than control and bureaucracy			
		Launch	We quickly go to market with the most promising opportunities			
		Scale	We rapidly allocate resources to scale initiatives that show market promise			
Success	External	Customers	Our customers think of us as an innovative organization			
		Competitors	Our innovation performance is much better than other firms in our industry			
		Financial	Our innovation efforts have led us to better financial performance than others in our industry			
	Organizational	Purpose	We treat innovation as a long term strategy rather than a short term fix			
		Discipline	We have a deliberate, comprehensive and disciplined approach to innovation			
		Capabilities	Our innovation projects have helped our organization develop new capabilities that we did not			
	Individual	Satisfaction	I am satisfied with my level of participation in our innovation initiatives			
		Growth	We deliberately stretch our people's competencies by getting them to participate in new initiatives			
		Reward	We reward people for participating in potentially risky opportunities, irrespective of the outcome			

APPENDIX B: BALDRIGE ASSESSMENT CRITERIA

Challenge Assessment program

1. Leadership

The Leadership category asks how senior leaders' personal actions guide and sustain your organization. It also asks about your organization's governance system; how your organization fulfills its legal, ethical, and societal responsibilities; and how it supports its key communities.

Answer the following questions in your assessment:

1. How do senior leaders set and communicate your organization's vision and values?
2. How do senior leaders create an environment for learning, performance improvement, and innovation to guide and sustain your organization?
3. How do senior leaders communicate with the workforce and encourage high performance and a customer and business focus?
4. What are your organization's governance system and processes for management and financial accountability, transparency in operations, and senior leader performance evaluation?
5. How does your organization promote and ensure legal and ethical behavior in all interactions?
6. How does your organization fulfill its societal responsibilities and support its key communities?

2. Strategic Planning

The Strategic Planning category asks how your organization develops strategic objectives and action plans, implements them, changes them if circumstances require, and measures progress.

Answer the following questions in your assessment:

1) How do you conduct strategic planning, including key steps, participants, and short- and longer-term planning horizons?
2) How do you use data, information, and comparative data to determine and address strategic opportunities, challenges, and advantages?
3) How do you determine key work systems and core competencies and use these in making work system decisions, including what work you will do internally and what you will outsource?
4) How do you develop strategic objectives? Summarize your organization's key strategic objectives and their related goals.
5) How do you convert strategic objectives into action plans and communicate these? Summarize your organization's key action plans, and action plan performance measures or indicators.
6) How do you allocate resources or ensure financial and other resources are available to support the achievement of your action plans?
7) How do you monitor progress against your objectives, and make changes to action plans when needed?

3. Customer Focus

The Customer Focus category asks how your organization engages its customers for long-term marketplace success, including how your organization listens to the voice of the customer, builds customer relationships, and uses customer information to improve and to identify opportunities for innovation.

Answer the following questions in your assessment:

- How do you listen to the voice of the customer?
- How do you determine customer requirements for products/services and communication methods to support customers?
- How do you build and manage customer relationships?
- How do you determine customer satisfaction and engagement and use this information to make improvements?
- How do you manage and resolve customer complaints and recover their confidence?

4. Measurement, Analysis, and Knowledge Management

The Measurement, Analysis, and Knowledge Management category asks how your organization selects, gathers, analyzes, and manages its data, information, and knowledge assets; how it learns; and how it manages information technology. The category also asks how your organization uses review findings to improve its performance.

Answer the following questions in your assessment:

1) How do you measure, analyze, review, and improve performance through the use of data and information at all levels and in all parts of your organization?
2) What are your key organizational performance measures?
3) How do you select comparative data and use it effectively to support decision-making?
4) How do you identify internal operations that are high performing and select and share their best practices with other areas of your organization?
5) How do you build and manage knowledge assets?
6) How do you ensure the quality and availability of needed data, information, software, and hardware for your workforce, suppliers, partners, collaborators, and customers and ensure availability in the event of an emergency?

5. Workforce Focus

The Workforce Focus category asks how your organization assesses workforce capability and capacity needs and builds a workforce environment conducive to high performance. The category also asks how your organization engages, manages, and develops your workforce to utilize its full potential in alignment with your organization's overall mission, strategy, and action plans.

Answer the following questions in your assessment:

1) How do you manage workforce capability and capacity to accomplish the work of the organization?
2) How do you recruit, hire, place, and retain new workforce members?
3) How do you maintain a healthy, secure, and supportive work climate?

4) How do you engage, compensate, recognize and reward your workforce to achieve high performance?
5) How do you assess workforce engagement and use the results to achieve higher performance?
6) How are members of your workforce, including leaders, developed to achieve high performance?
7) How do you manage effective career progression and succession planning including the transfer of knowledge from departing or retiring workforce members?

6. Operations Focus

The Operations Focus category asks how your organization designs, manages, and improves its products, services, and work processes and improves operational effectiveness to deliver customer value and achieve organizational success and sustainability.

Answer the following questions in your assessment:

- How do you design your products/services and the key work processes that deliver these, and determine key product/service requirements and key work process requirements?
- How do you manage, measure, and improve key work processes and support processes to improve performance and reduce variability?
- How do you control the overall costs of your operations?
- How do you manage supplier performance?

- How do you provide a safe operating environment and ensure workplace preparedness for disasters or emergencies?

7. Results

The Results category asks about your organization's performance and improvement in all key areas—product and process results, customer-focused results, workforce-focused results, leadership and governance results, and financial and market results. The category asks about performance levels relative to those of competitors and other organizations with similar product offerings.

Provide results that address the following questions in your assessment:

1) What are your organization's key product/service performance and process effectiveness and efficiency results? Include processes that directly serve customers, strategy, and operations (including emergency preparedness and supply chain management). Segment your results by product/service offerings, by customer groups and market segments, and by process types and locations as appropriate. Include appropriate comparative data.
2) What are your organization's key customer- focused results for customer satisfaction, dissatisfaction, and engagement? Segment your results by product/service offerings, customer groups, and market segments, as appropriate. Include appropriate comparative data.
3) What are your organization's key workforce- focused results for workforce environment and for your workforce engagement? Segment

your results to address the diversity of your workforce and to address your workforce groups and segments, as appropriate. Include appropriate comparative data.

4) What are your organization's key senior leadership and governance results, including those for fiscal accountability, legal compliance, ethical behavior, societal responsibility, support of key communities, and strategy implementation? Segment your results by organizational units, as appropriate. Include appropriate comparative data.
5) What are your organization's key financial and marketplace performance results by market segments or customer groups, as appropriate? Include appropriate comparative data.

GSA Assessment program

1. Leadership

1.1. Senior Leadership: How do your senior leaders lead the organization?

a. Vision, Values, and Mission

1) Vision and Values: How do senior leaders set your organization's vision and values? How do senior leaders deploy the vision and values through your leadership system, to the workforce, to key suppliers and partners, and to customers and other stakeholders, as appropriate? How do senior leaders' personal actions reflect a commitment to those values?

2) Promoting Legal and Ethical Behavior: How do senior leaders' actions demonstrate their commitment to legal and ethical behavior? How do they promote an organizational environment that requires it?

3) Creating a Successful Organization: How do senior leaders' actions build an organization that is successful now and in the future? How do they:

- create an environment for the achievement of your mission, improvement of organizational performance, performance leadership, organizational learning, and learning for people in the workforce;
- create a workforce culture that delivers a consistently positive customer experience and fosters customer engagement;
- create an environment for innovation and intelligent risk taking, achievement of your strategic objectives, and organizational agility; and

- participate in succession planning and the development of future organizational leaders?

b. Communication and Organizational Performance

1) Communication: How do senior leaders communicate with and engage the entire workforce and key customers? How do they:

- encourage frank, two-way communication, including effective use of social media, when appropriate;
- communicate key decisions and needs for organizational change; and
- reinforce high performance and a customer and business focus by taking a direct role in motivating the workforce, including by participating in reward and recognition programs?

2) Focus on Action: How do senior leaders create a focus on action that will achieve the organization's mission? How do senior leaders:

- create a focus on action that will improve the organization's performance, achieve innovation and intelligent risk taking, and attain its vision;
- identify needed actions; and
- in setting expectations for organizational performance, include a focus on creating and balancing value for customers and other stakeholders?

1.2. Governance and Societal Responsibilities: How do you govern your organization and fulfill your societal responsibilities

a. Organizational Governance

1) Governance System: How does your organization ensure responsible Governance? How do you review and achieve the following key aspects of your Governance system:
    - Accountability for senior leaders' actions;
    - Accountability for strategic plans;
    - Fiscal accountability;
    - Transparency in operations;
    - Selection of governance board members and disclosure policies for them, as appropriate;
    - Independence and effectiveness of internal and external audits;
    - Protection of stakeholder and stockholder interest, as appropriate;
    - Succession planning for senior leaders?
2) Performance Evaluation: How do you evaluate the performance of your senior leaders, including the chief executive, and your governance board?
    - How do you use performance evaluations in determining executive compensation?
    - How do your senior leaders and governance board use these performance evaluations to advance their development and improve both their own effectiveness as leaders and that of your board and leadership system, as appropriate?

b. Legal and Ethical Behavior

1) Legal and Regulatory Compliance: How do you anticipate and address public concerns with your products, services, and operations? How do you:

   - address any adverse societal impacts of your products, services, and operations;
   - anticipate public concerns with your future products, services, and operations; and
   - prepare for these impacts and concerns proactively, including through conservation of natural resources and effective supply chain management processes, as appropriate?
   - What are your key compliance processes, measures, and goals for meeting and surpassing regulatory and legal requirements, as appropriate? What are your key processes, measures, and goals for addressing risks associated with your products, services, and operations?

2) Ethical Behavior: How do you promote and ensure ethical behavior in all interactions?

   - What are your key processes and measures or indicators for enabling and monitoring ethical behavior in your governance structure; throughout your organization; and in interactions with your workforce, customers, partners, suppliers, and other stakeholders?
   - How do you monitor and responds to breaches of ethical behavior?

c. Societal Responsibilities

1) Societal Well-Being: How do you consider societal well-being and benefit as part of your strategy and daily operations? How do you contribute to societal well-being through your environmental, social, and economic systems?

2) Community Support: How do you actively support and strengthen your key communities?

- What are your key communities?
- How do you identify them and determine areas for organizational involvement, including areas that leverage your core competencies?
- How do your senior leaders, in concert with your workforce, contribute to improving these communities?

2. Strategic Planning

2.1. Strategy Development: How do you develop your strategy?

a. Strategy Development Process

1) Strategic Planning Process: How do you conduct your strategic planning? What are your key process steps? Who are the key participants? What are your short- and longer-term planning horizons? How are they addressed in the planning process? How does your strategic planning process address the potential need for:

- transformational change and prioritization of change initiatives;
- organizational agility; and
- operational flexibility?

2) Innovation: How does your strategy development process stimulate and incorporate innovation? How do you identify strategic opportunities? How do you decide which strategic opportunities are intelligent risks for pursuing? What are your key strategic opportunities?

3) Strategy Considerations: How do you collect and analyze relevant data and develop information for your strategic planning process? In this collection and analysis, how do you include these key elements?

- Your strategic challenges and strategic advantages
- Risks to your organization's future success
- Potential changes in your regulatory environment
- Potential blind spots in your strategic planning process and information
- Your ability to execute the strategic plan

4) Work Systems and Core Competencies: What are your key work systems? How do you make work system decisions that facilitate the accomplishment of your strategic objectives? How do you decide which key processes will be accomplished by external suppliers and partners? How do those decisions consider your core competencies and the core competencies of potential suppliers and partners? How do you determine future organizational core competencies and work systems?

b. Strategic Objectives

1) Key Strategic Objectives: What are your organization's key strategic objectives and timetable for achieving them? What are your most

important goals for these strategic objectives? What key changes, if any, are planned in your products and services, customers and markets, suppliers and partners, and operations?

2) Strategic Objective Considerations: How do your strategic objectives achieve appropriate balance among varying and potentially competing organizational need? How do your strategic objectives:
   - address your strategic challenges and leverage your core competencies, strategic advantages, and strategic opportunities;
   - balance short- and longer-term planning horizons; and
   - consider and balance the needs of all key stakeholders?

2.2. Strategy Implementation: How do you implement your strategy?

a. Action Plan Development and Deployment

1) Action Plans: What are your key short- and longer-term action plans? What is their relationship to your strategic objectives? How do you develop your action plans?

2) Action Plan Implementation: How do you deploy your action plans? How do your deploy your action plans to your workforce and to key suppliers and partners, as appropriate, to ensure that you achieve your key strategic objectives? How do you ensure that you can sustain the key outcomes of your action plans?

3) Resource Allocation: How do you ensure that financial and other resources are available to support the achievement of your action plans while you meet current obligations? How do you allocate these resources

to support the plans? How do you manage the risks associated with the plans to ensure your financial viability?

4) Workforce Plans: What are your key workforce plans to support your short- and longer-term strategic objectives and action plans? How do the plans address potential impacts on your workforce members and any potential changes in workforce capability and capacity needs?
5) Performance Measures: What key performance measures or indicators do you use to track the achievement and effectiveness of your action plans? How does your overall action plan measurement system reinforce organizational alignment?
6) Performance Projections: For these key performance measures or indicators, what are your performance projections for your short- and longer-term planning horizons? How does your projected performance on these measures or indicators compare with your projections of the performance of your competitors or comparable organizations and with key benchmarks, as appropriate? If there are gaps in performance against your competitors or comparable organizations, how do you address them?

b. Action Plan Modified:

How do you establish and implement modified action plans if circumstances require a shift in plans and rapid execution of new plans?

3. Customer Focus

3.1. Voice of the Customer: How do you obtain information from your customers?

a. Customer Listening

1) Current Customers: How do you listen to, interact with, and observe customers to obtain actionable information? How do your listening methods vary for different customers, customer groups, or market segments? How do you use social media and web-based technologies to listen to customers, as appropriate? How do your listening methods vary across the customer life cycle? How do you seek immediate and actionable feedback from customers on the quality of products and services, customer support, and transactions?

2) Potential Customers: How do you listen to potential customers to obtain actionable information? How do you listen to former customers, potential customers, and competitor's customers to obtain actionable information on your products and services, customer support, and transactions, as appropriate?

b. Determination of Customer Satisfaction and Engagement

1) Satisfaction, Dissatisfaction, and Engagement: How do you determine customer satisfaction, dissatisfaction, and engagement? How do your determination methods differ among your customer groups and market segments, as appropriate? How do your measurements capture actionable information to use in exceeding your customers' expectations and securing your customers' engagement for the long term?

2) Satisfaction Relative to Competitors: How do you obtain information on your customers' satisfaction:

- relative to their satisfaction with your competitors; and
- relative to the satisfaction of customers of other organizations that provide similar products and services or to industry benchmarks, as appropriate?

3.2. Customer Engagement: How do you engage customers by serving their needs and building relationships?

a. Product Offerings and Customer Support

1) Product/Service Offerings: How do you determine product offerings and services? How do you:

- determine customer and market needs and requirements for product offerings and services;
- identify and adapt product/service offerings to meet the requirements and exceed the expectations of your customer groups and market segments; and
- identify and adapt product/service offerings to enter new markets, to attract new customers, and to create opportunities to expand relationships with current customers, as appropriate?

2) Customer Support: How do you enable customers to seek information and support? How do you enable them to conduct business with you? What are your key means of customer support, including your key

communication mechanisms? How do they vary for different customers, customer groups, or market segments? How do you:

- determine your customers' key support requirements; and
- deploy these requirements to all people and processes involved in customer support?

3) Customer Segmentation: How do you determine your customer groups and market segments? How do you:

- use information on customers, markets, and product offerings to identify current and anticipate future customer groups and market segments;
- consider competitors' customers and other potential customers and markets in this segmentation; and
- determine which customers, customer groups, and market segments to emphasize and pursue for business growth?

b. Customer Relationships

1) Relationship Management: How do you build and manage customer relationships? How do you market, build, and manage relationships with customers to:

- acquire customers and build market share;
- manage and enhance your brand image;
- retain customers, meet their requirements, and exceed their expectations in each stage of the customer life cycle; and
- increase their engagement with you?
- How do you leverage social media to manage and enhance your brand and to enhance?

2) Complaint Management: How do you manage customer complaints? How do you resolve complaints promptly and effectively? How does your management of customer complaints enable you to recover your customers' confidence, enhance their satisfaction and engagement, and avoid similar complaints in the future?

4. Measurement, Analysis, and Knowledge Management

4.1. Measurement, Analysis, and Improvement of Organizational Performance: How do you measure analyze, and then improve organizational performance?

a. Performance Measurement

1) Performance Measures: How do you use data and information to track daily operations and overall organizational performance? How do you:

- select, collect, align, and integrate data and information to use in tracking daily operations and overall organizational performance; and
- track progress on achieving strategic objectives and action plans?
- What are your key organizational performance measures, including key short- and longer-term financial measures? How frequently do you track these measures?

2) Comparative Data: How do you select and effectively use comparative data and information? How do you select and effectively use key comparative data and information to support operational decision making?

3) Customer Data: How do you use voice-of-the-customer and market data and information? How do you:

- select and effectively use voice-of-the-customer and market data and information (including aggregated data on complaints) to build a more customer-focused culture and to support operational decision making; and
- use data and information gathered through social media, as appropriate?

4) Measurement Agility, how do you ensure that your performance measurement system can respond to rapid or unexpected organizational or external changes?

b. Performance Analysis and Review:

How do you review your organization's performance and capabilities? How do you use your key organizational performance measures, as well as comparative and customer data, in these reviews? What analyses do you perform to support these reviews and ensure that conclusions are valid? How do your organization and its senior leaders use these reviews to:

- assess organizational success, competitive performance, financial health, and progress on achieving your strategic objectives and action plans; and
- respond rapidly to changing organizational needs and challenges in your operating environment, including any need for transformational change in organizational structure and work systems?
- How does your governance board review the organization's performance and its progress on strategic objectives and action plans, if appropriate?

c. Performance Improvement

1) Best Practices: How do you share best practices in your organization? How do you identify organizational units or operations that are high performing? How do you identify their best practices for sharing and implementing them across the organization, as appropriate?
2) Future Performance: How do you project your organization's future performance? How do you use findings from performance reviews (addressed in 4.1b) and key comparative and competitive data in projecting future performance? How do you reconcile any differences between these projections of future performance and performance projections developed for your key action plans (addressed in 2.2a[6])?
3) Continuous Improvement and Innovation: How do you sue findings from performance reviews (addressed in 4.1b) to develop priorities for continuous improvement and opportunities for innovation? How do you deploy these priorities and opportunities:
   - to work group and functional-level operations; and
   - when appropriate, to your suppliers, partners, and collaborators to ensure organizational alignment?

4.2. Knowledge Management, Information, and Information Technology: How do you manage your organizational knowledge assets, information, and information technology infrastructure?

a. Organizational Knowledge

1) Knowledge Management: How do you manage organizational knowledge? How do you:
   - collect and transfer workforce knowledge;
   - blend and correlate data from different sources to build new knowledge;
   - transfer relevant knowledge from and to customers, suppliers, partners, and collaborators; and
   - assemble and transfer relevant knowledge for use in your innovation and strategic planning processes?
2) Organizational Learning: How do you use your knowledge and resources to embed learning in the way your organization operates?

b. Data, Information, and Information Technology

1) Data and Information Quality: How do you verify and ensure the quality of organizational data and information? How do you manage electronic and other data and information to ensure their accuracy and validity; integrity and reliability; and currency?

2) Data and Information Security: How do you ensure the security of sensitive or privileged data and information? How do you manage electronic and other data and information to ensure confidentiality and only appropriate access? How do you oversee the cybersecurity of your information systems?

3) Data and Information Availability: How do you ensure the availability of organizational data and information? How do you make needed data and

information available in a user-friendly format and timely manner to your workforce, suppliers, partners, collaborators, and customers, as appropriate?

4) Hardware and Software Properties: How do you ensure that hardware and software are reliable, secure, and user friendly?

5) Emergency Availability: In the event of an emergency, how do you ensure that hardware and software systems, and data and information continue to be secure and available to effectively serve customers and business needs?

5. Workforce Focus

5.1. Workforce Environment: How do you build an effective and supportive workforce environment?

a. Workforce Capability and Capacity

1) Capability and Capacity: How do you assess your workforce capability and capacity needs? How do you assess the skills, competencies, certifications, and staffing levels you need?

2) New Workforce Members: How do you recruit, hire, place, and retain new workforce members? How do you ensure that your workforce represents the diverse ideas, cultures, and thinking of your hiring and customer community?

3) Work Accomplishment: How do you organize and manage your workforce? How do you organize and manage your workforce to:

- accomplish your organization's work;

- capitalize on your organization's core competencies;
- reinforce a customer and business focus; and
- exceed performance expectations?

4) Workforce Change Management: How do you prepare your workforce for changing capability and capacity needs? How do you:

- manage your workforce, its needs, and your organization's needs to ensure continuity, prevent workforce reductions, and minimize the impact of such reductions, if they become necessary;
- prepare for and manage periods of workforce growth; and prepare your workforce for changes in organizational structure and work systems, when needed?

b. Workforce Climate

1) Workplace Environment: How do you ensure workplace health, security, and accessibility for the workforce? What are your performance measures and improvement goals for your workplace environmental factors? For your different workplace environments, what significant differences are there in these factors and their performance measures or targets?

2) Workforce Benefits and Policies: How do you support your workforce via services, benefits, and policies? How do you tailor these to the needs of a diverse workforce and different workforce groups and segments? What key benefits do you offer your workforce?

5.2. Workforce Engagement: How do you engage your workforce to achieve a high-performance work environment?

a. Workforce Engagement and Performance

1) Organizational Culture: How do you foster an organizational culture that is characterized by open communication, high performance, and an engaged workforce? How do you ensure that your organizational culture benefits from the diverse ideas, cultures, and thinking of your workforce? How do you empower your workforce?

2) Drivers of Engagement: How do you determine the key drivers of workforce engagement? How do you determine these drivers for different workforce groups and segments?

3) Assessment of Engagement: How do you assess workforce engagement? What formal and informal assessment methods and measures do you use to determine workforce engagement, including satisfaction? How do these methods and measures differ across workforce groups and segments? How do you also use other indicators, such as workforce retention, absenteeism, grievances, safety, and productivity, to assess and improve workforce engagement?

4) Performance Management: How does your workforce performance management system support high performance and workforce engagement? How does it consider workforce compensation, reward, recognition, and incentive practices? How does it reinforce:

- intelligent risk taking to achieve innovation;
- a customer and business focus; and
- achievement of your action plans?

b. Workforce and Leader Development

1) Learning and Development System: How does your learning and development system support the organization's needs and the personal development of your workforce members, managers, and leaders? How does the system:

- address your organization's core competencies, strategic challenges, and achievement of short-and longer-term action plans;
- support organizational performance improvement, organizational change, and innovation;
- support ethics and ethical business practices;
- improve customer focus;
- ensure the transfer of knowledge from departing or retiring workforce members; and
- ensure the reinforcement of new knowledge and skills on the job?

2) Leaning and Development Effectiveness: How do you evaluate the effectiveness and efficiency of your learning and development system? How do you:

- correlate learning and development outcomes with findings from your assessment of workforce engagement and with key business results reported in Category 7; and
- use the correlations to identify opportunities for improvement in both workforce engagement and learning and development offerings?

3) Career Progression: How do you manage career progression for your organization? How do you manage career development for your workforce? How do you carry out succession planning for management and leadership positions?

6. Operations Focus

6.1. Work Processes: How do you design, manage, and improve your key products and services and work processes?

a. Product, Service and Process Design

1) Products/Services and Process Requirements: How do you determine key product/service and work process requirements? What are your organization's key work processes? What are the key requirements for these work processes?

2) Design Concepts: How do you design your products, services, and work processes to meet requirements? How do you incorporate new technology, organizational knowledge, product and service excellence, customer value, and the potential need for agility into these products, services, and processes?

b. Process Management

1) Process Implementation: How does your day-to-day operation of work processes ensure that they meet key process requirements? What key performance measures or indicators and in-process measures do you use to control and improve your work processes? How do these measures relate to end-product quality and performance?

2) Support Processes: How do you determine your key support processes? What are your key support processes? How does your day-to-day operation of these processes ensure that they meet key business support requirements?

3) Product/Service and Process Improvement: How do you improve your work processes to improve products/services and performance, enhance your core competencies, and reduce variability?

c. Innovation Management:

How do you manage for innovation? How do you pursue the strategic opportunities that you determine are intelligent risks? How do you make financial and other resources available to pursue these opportunities? How do you discontinue pursuing opportunities at the appropriate time to enhance support for higher-priority opportunities?

6.2. Operational Effectiveness: How do you ensure effective management of your operations? In your response, include answers to the following questions:

a. Process Efficiency and Effectiveness:

How do you control costs of your operations? How do you:

- incorporate cycle time, productivity, and other efficiency and effectiveness factors into your work processes;
- prevent defects, service errors, and rework;
- minimize warranty costs or customers' productivity losses, as appropriate;

- minimize the costs of inspections, tests, and process performance audits, as appropriate; and balance the need for cost control with the needs of your customers?

b. Supply Chain Management: How do you manage your supply chain? How do you:

- select suppliers and ensure that they are qualified and positioned to not only meet operational needs but also enhance your performance and your customers' satisfaction;
- measure and evaluate your suppliers' performance;
- provide feedback to your suppliers to help them improve; and deal with poorly performing suppliers?

c. Safety and Emergency Preparedness

1) Safety: How do you provide a safe operating environment? How does your safety system address accident prevention, inspection, root-cause analysis of failures, and recovery?

2) Emergency Preparedness: How does your disaster and emergency preparedness system consider prevention, continuity of operations, and recovery? How does your disaster and emergency preparedness system take your reliance on suppliers and partners into account?

7. Results

7.1. Product/Service and process Results: What are your product performance and process effectiveness results?

a. Customer Focused Product and Service Results

What are your results for your products/services and your customer service processes? What are your current levels and trends in key measures or indicators of the performance of products and services that are important to and directly serve your customers? How do these results compare with the performance of your competitors and other organizations with similar offerings? How do these results differ by product/service offerings, customer groups, and market segments, as appropriate?

b. Work Process Effectiveness Results

1) Process Effectiveness and Efficiency: What are your process effectiveness and efficiency results? What are your current levels and trends in key measures or indicators of the operational performance of your key work and support processes, including productivity, cycle time, and other appropriate measures of process effectiveness, efficiency, and innovation? How do these results compare with the performance of your competitors and other organizations with similar processes? How do these results differ by process types, as appropriate?

2) Emergency Preparedness: What are your emergency preparedness results? What are your current levels and trends in key measures or indicators of the effectiveness of your organization's preparedness for disasters or emergencies: How do these results differ by location or process type, as appropriate?

c. Supply Chain Management Results

What are your supply chain management results? What are your results for key measures or indicators of the performance of your supply chain, including its contribution to enhancing your performance?

7.2. Customer-Focused Results: What are your customer-focused performance results?

a. Customer-Focused Results

1) Customer Satisfaction: What are your customer satisfaction and dissatisfaction results? What are your current levels and trends in key measures or indicators of customer satisfaction and dissatisfaction? How do these results compare with those of your competitors and other organizations providing similar products? How do these results differ by product offerings, customer groups, and market segments, as appropriate?

2) Customer Engagement: What are your customer engagement results? What are your current levels and trends in key measures or indicators of customer engagement, including those for building customer relationships? How do these results compare over the course of your customer life cycle as appropriate? How do these results differ by product offerings, customer groups, and market segments, as appropriate?

7.3. Workforce-Focused Results: What are your workforce-focused performance results?

a. Workforce-Focused Results

1) Workforce Capability and Capacity: What are your workforce capability and capacity result? What are your current levels and trends in key measures of workforce capability and capacity, including appropriate skills and staffing levels? How do these results differ by the diversity of your workforce and by your workforce groups and segments, as appropriate?
2) Workforce Climate: What are your workforce climate results? What are your current levels and trends in key measures or indicators of your workforce climate, including those for workforce health, safety, and security and workforce services and benefits, as appropriate? How do these results differ by the diversity of your workforce and by your workforce groups and segments, as appropriate?
3) Workforce Engagement: What are your workforce engagement results? What are your current levels and trends in key measures or indicators of workforce satisfaction and workforce engagement? How do these results differ by the diversity of your workforce and by your workforce groups and segments, as appropriate?
4) Workforce Development: What are your workforce and leader development results? What are your current levels and trends in key measures or indicators of workforce and leader development? How do these results differ by the diversity of your workforce and by your workforce groups and segments, as appropriate?

7.4. Leadership and Governance Results: What are your senior leadership and governance results?

a. Leadership, Governance, and Societal Responsibility Results

1) Leadership: What are your results for senior leaders' communication and engagement with the workforce and customers? What are your results for key measures or indicators of senior leaders; communication and engagement with the workforce and customers to deploy your vision and values, encourage two-way communication, and create a focus on action? How do these results differ by organizational units and customer groups, as appropriate?

2) Governance: What are your results for governance accountability? What are your key current findings and trends in key measures or indicators of governance and internal and external fiscal accountability, as appropriate?

3) Law and Regulation: What are your legal and regulatory results? What are your results for key measures or indicators of meeting and surpassing regulatory and legal requirements? How do these results differ by organizational units, as appropriate?

4) Ethics: What are your results for ethical behavior? What are your results for key measures or indicators of ethical behavior, breaches of ethical behavior, and stakeholder trust in your senior leaders and governance? How do these results differ by organizational units, as appropriate?

5) Society: What are your results for societal responsibility and support of your key communities? What are your results for key measures or

indicators of your fulfillment of your societal responsibilities and support of your key communities?

b. Strategy Implementation Results

What are your results for the achievement of your organizational strategy and action plans? What are your results for key measures or indicators of the achievement of your organizational strategy and action plans? What are your results for building and strengthening core competencies? What are your results for taking intelligent risks?

7.5. Financial and Market Results: What are your financial and marketplace performance results?

a. Financial and Market Results

1) Financial Performance: What are your financial performance results? What are your current levels and trends in key measures or indicators of financial performance, including aggregate measures of financial return, financial viability, and budgetary performance, as appropriate? How do these results differ by market segments and customer groups, as appropriate?

2) Marketplace Performance: What are your marketplace performance results? What are your current levels and trends in key measures or indicators of marketplace performance, including market share or position, market and market share growth, and new markets entered, as appropriate? How do these results differ by market segments and customer groups, as appropriate?

Sustain Assessment program

I. EXECUTIVE SUMMARY

Baseline – Areas to Address

a) Identify the year(s) when the organization was recognized as a role model.
b) What, if anything, is different with respect to the scope of this organization compared to the award year organization?
c) Briefly summarize key approaches and results that contributed to the organization's role model recognition.
d) Briefly summarize significant challenges/opportunities cited in first assessment.

Evidence of Sustained Performance Excellence

a) Summarize the key leadership and management approaches (if any) that have changed or evolved since the award year.
b) Summarize any awards, achievements, certifications, re-certifications, and recognition, including significance/relevance, since the Governor's Sterling Award.
c) Briefly summarize your analysis of whether the organization has continually improved and maintained its role model status—or not—based on the current assessment.

II. SUSTAINING A CULTURE OF PERFORMANCE EXCELLENCE

a) Summarize evidence that indicates this organization will operate in good health two to five years from now or beyond.

b) Summarize any recent improvements to the organization's governance system that has reduced systemic risk, increased its ability to handle disruptions, and positioned it for future growth and/or sustainability.

c) Summarize how and to what extent the organization embraces a culture of continuous learning. Briefly list any significant, implemented organizational innovations.

d) Summarize any opportunistic decisions that led to strategic organizational breakthroughs.

e) What progress has the organization made in relation to its strategic actions, objectives, and goals identified at the time it received the Governor's Sterling Award?

f) Summarize any potential industry, market, environmental, or regulatory challenges and/or threats related to future sustainability and any mitigating steps the organization is taking to address these challenges.

III. KEY ORGANIZATIONAL APPROACHES

a) Summarize 3-5 most significant approach strengths. Include how the organization specifically addressed opportunities cited in the previous assessment and how its approaches have continued to evolve and improve since the previous assessment.

b) Summarize 2-3 most significant opportunities for improvement related to the organization's approaches.

c) Summarize 3-5 most significant approach strengths. Provide evidence that the organization specifically addresses Criteria changes that occurred since it achieved the Governor's Sterling Award.

d) Summarize 2-3 most significant opportunities for improvement related to the organization's approaches.

IV. KEY ORGANIZATIONAL RESULTS

a) Summarize 3-5 most significant results strengths. These should be themes focused on how the organization sustained and/or improved key results since award-year evaluation. Give focus to new results identified due to changes in organizational priorities, the industry/sector, and in competitor/comparison performance.

b) Summarize 2-3 most significant opportunities or remaining challenges related to the organization's results.

APPENDIX C: INNOVATION SURVEY DATA

Table 53: Innovation survey data

#	Year	Organization Code	Assessment Type	Innovation overall score	Innovation Value	Innovation Behavior	Innovation Climate	Innovation Resources	Innovation Process	Innovation Success
1	2013	SIC109	Challenge	1.54	1.67	1.33	1.22	2.50	1.33	1.17
2	2011	SIC124	Challenge							
3	2014	SIC114	Challenge	1.72	1.78	1.89	1.56	1.22	1.67	2.22
4	2011	SIC123	Challenge							
5	2012	SIC125	Challenge							
6	2013	SIC117	Challenge	2.76	3	3.06	3.5	2.44	2.11	2.44
7	2014	SIC126	Challenge							
8	2014	SIC120	Challenge	3.76	4.33	4.22	3.22	3.94	3.33	3.50
9	2014	SIC116	GSA							
10	2011	SIC121	GSA							
11	2014	SIC108	GSA	3.85	4.00	4.67	4.11	3.33	2.89	4.11
12	2011	SIC111	GSA							
13	2014	SIC118	GSA							
14	2012	SIC103	GSA							
15	2014	SIC107	GSA	4.28	4.5	4.35	4.28	4.11	3.9	4.53
16	2012	SIC112	GSA							
17	2013	SIC110	GSA	4.56	4.56	4.56	4.67	4.56	4.44	4.56
18	2011	SIC115	GSA							
19	2012	SIC127	Sustained							
20	2011	SIC104	Sustained	3.96	3.94	4.06	4.00	3.78	3.72	4.28
21	2014	SIC102	Sustained	4.05	4.33	4.41	4.22	3.74	3.74	3.85
22	2011	SIC122	Sustained							
23	2013	SIC101	Sustained	3.29	3.64	3.45	3.12	3.05	3.05	3.45
24	2011	SIC106	Sustained	4.29	4.33	4.28	4.28	4.33	4.00	4.50

APPENDIX D: PERFORMANCE EXCELLENCE DATA

Table 54: Performance excellence data

Number	Year	Organization Code	Assessment Type	Process score	Result score	Performance score
1	2013	SIC109	Challenge	248	63	311
2	2011	SIC124	Challenge	200	135	335
3	2014	SIC114	Challenge	288	63	351
4	2011	SIC123	Challenge	240	135	375
5	2012	SIC125	Challenge	348	63	411
6	2013	SIC117	Challenge	308	135	443
7	2014	SIC126	Challenge	368	207	575
8	2014	SIC120	Challenge	456	207	663
9	2014	SIC116	GSA	416	149	565
10	2011	SIC121	GSA	436	178	614
11	2014	SIC108	GSA	416	207	623
12	2011	SIC111	GSA	442	193	635
13	2014	SIC118	GSA	456	207	663
14	2012	SIC103	GSA	452	221	673
15	2014	SIC107	GSA	466	250	716
16	2012	SIC112	GSA	488	250	738
17	2013	SIC110	GSA	507	250	757
18	2011	SIC115	GSA	529	243	772
19	2012	SIC127	Sustained	451	241	692
20	2011	SIC104	Sustained	528	223	751
21	2014	SIC102	Sustained	499	264	763
22	2011	SIC122	Sustained	538	241	779
23	2013	SIC101	Sustained	518	264	782
24	2011	SIC106	Sustained	538	253	791

APPENDIX E: IRB HUMAN SUBJECTS PERMISSION LETTER

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Mohammed Alomairy**

Date: **December 03, 2013**

Dear Researcher:

On 12/3/2013, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination
Project Title:	The effect of Sterling (Baldrige) program on organization's innovation/dynamic capabilities.
Investigator:	Mohammed Alomairy
IRB Number:	SBE-13-09800
Funding Agency:	
Grant Title:	
Research ID:	N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 12/03/2013 09:29:25 AM EST

IRB Coordinator

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