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A Framework To Improve A Nation's Competitiveness Through Quality Awards And Performance Improvement Tools

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**A FRAMEWORK TO IMPROVE A NATION'S COMPETITIVENESS THROUGH
QUALITY AWARDS AND PERFORMANCE IMPROVEMENT TOOLS**

by

AMR H. ALAMRI

DISSERTATION

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfilment of the requirements

For the degree of

DOCTOR OF PHILOSOPHY

2015

MAJOR: INDUSTRIAL ENGINEERING

Approved By:

Advisor

Date

DEDICATION

To my mother, Zaina for her patience and support.

To my father, Hamood, for his support and guidance.

To my wife, Sahar, for her love, patience, support, and understanding.

To my son, Saud, for his patience and for understanding my absence in this early years.

To my brother, Saif for his support.

To my brother, Eihab for his patience.

To my sister, Farah.

To my grandmother, Dokhnah.

This PhD dissertation is also dedicated to the grandchildren who hold the name of the great

Abdullah Ben Shdayyed:

Abdallah, Eihab, Jamal, Homoud, Saif, Rayan, Rashad, Rakan

Thank you all

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I also would like to express my thanks and appreciation to Dr. Leslie Monplaisir for his support and advice as the masters' program advisor, as the Departments' chairperson later, and as member of my PhD dissertation committee. Thanks and appreciation to Dr. Ahmed Ezzeddine for his support as a member of the committee and for his support during my presidency for the Saudi Students Organization at the University. I have also received support and encouragement from Dr. Darin Ellis, and I thank him for this support in addition to the advice and guidance I received.

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CHAPTER 1: INTRODUCTION

1.1 Background

The world is a small village. The amount of knowledge and information available today in all aspects is immense. With the Internet and social media tools, individuals can access any information. Organizations and firms also have a tremendous amount of data about industry processes and customers available to them. Even countries are much more aware of the economics, healthcare, and education of other nations.

Countries, or governments, aim to provide a better life for their citizens through better services and higher income. Each country tries to achieve this by utilizing and monitoring its resources to the maximum level of outputs. However, each country has different natural resources in quality and quantity; including its human resources. Countries constantly stimulate their economy and attempt to provide all elements required in order to improve the economy and the quality of services. Their approach to achieving these results differs according to resources, geographical location, human resources, and cultural values.

One of the first steps toward national improvement is a firm understanding of where a country stands among other nations, in other words, benchmarking. Two known references that provide such a benchmark are the Global Competitiveness Index Report published by the World Economic Forum and competitiveness reports published by the International Monetary Fund (IMF). Many countries, especially developing countries, consider these reports definitive guides on what needs to be improved and just how to approach that.

Improving a nation's competitiveness is no minor task. Because there are many measures and factors that influence this improvement, such as healthcare services, education services, financial services, and the like, nations have different approaches on how to raise their

level of competitiveness. The building blocks of a nation's competitiveness are its organizations. Indeed, the improved services provided by public, private or non-profit organizations within a nation are what determines the nations' overall competitiveness level. One initiative that aims to improve organizations' competitiveness is the establishment of a quality (or business excellence) award. However, can we improve national competitiveness by adjusting the requirements to improve national competitiveness and applying the same measures to improve organizational competitiveness? There are existing measures of national competitiveness in the literature, but few research papers suggest how a nation could improve its competitiveness through quality improvement methods such as the national quality award. In this study, we provide a framework that enables nations to improve their competitiveness using quality tools.

1.2 Significance Of The Study

This study aims to help countries, especially developing countries, to improve their national competitiveness. A framework to improve competitiveness using known quality tools, specifically quality awards, Six Sigma, and Human Performance Improvement (HPI), is suggested. The framework adds new value to quality awards by expanding their scope to consider the national competitiveness in addition to helping firms to achieve excellence. This also involves improving firms' competitiveness through a combined approach of Six Sigma and Human Performance Technology (HPT) that will be discussed later.

The framework also provides a roadmap for quality award custodians and quality practitioners that will result in improved competitiveness to the nation as a whole. The continuity of the framework, which is based on a Plan-Do-Check-Act (PDCA) cycle, will help countries both to adjust quality criteria according to the changes in competitiveness results and to meet individual needs.

In summary, this study will contribute to the literature by filling the following gaps:

1. Although it is known in that a nation's competitiveness at a macro level depends on the improvement of its micro-level organizations (Porter, 2004), little research has been done to show the relationship between a nation's global competitiveness on one side, and the competitiveness of micro-level organizations on the other. This research shows a direct relationship between national competitiveness and improvements within its organizations. The purpose of showing this relationship is to enable nations to focus and control their efforts toward their organizations in order to improve their overall macro competitiveness level.
2. After identifying the relationship between a nation's competitiveness and micro-level competitiveness of organizations, the study expands its scope to locate areas of improvement of a nation and develops a model that will help nations to improve these areas. The tool that the study proposes is the criteria and requirements of the national quality award within the country. This will help governments to encourage companies to focus on these areas.
3. This research also provides guidelines for the custodians of national quality awards on changes and amendments to the model for the new revision of the award criteria. The study analyzes changes on quality awards and categorizes these changes in an attempt to gain a better understanding of historical changes and the dynamics of the award criteria. In the literature, little research is available on what methodology is used for establishing a new version of the criteria of the quality award. This study opens the field for a new systematically structured method that will determine which changes are required in quality

awards and what percentage of weight should be assigned to each section within the award criteria.

4. The study also provides a performance tool to improve micro-level competitiveness at the organizational level. It compares two improvement methods: Six Sigma and Human Performance Improvement (HPI). Six Sigma originates from the field of quality and manufacturing as a data-based driven methodology, where HPI has its roots in the field of education, with a concentration on human performance and psychology. Both approaches could be used together to improve organizational competitiveness since they cover both the human and the non-human elements of an organization.

Cetindamar & Hakan (2013) have developed a general model for an award system based on parameters that determine a firm's competitiveness as a tool to improve national competitiveness (Cetindamar & Hakan,2013). The authors of this study recognized the similarities between their proposed model and the criteria of national quality awards. This study expands on their contribution by using quality award criteria rather than establishing a new award designed specifically for national competitiveness.

1.3 Research Contents

This dissertation is composed of five chapters. Each chapter will present the following:

- The study begins with a brief background of the topic in Chapter 1. An introduction to the topic of competitiveness on a macro level, i.e. national competitiveness, and a micro level, i.e. operational and organizational level in section 1.1. Section 1.2 indicates the significance of the study to scholars and practitioners. It also introduces the basis for the framework that will be presented. The chapter concludes with the structure of this dissertation.

- Chapter 2 introduces and discusses competitiveness in the literature. The chapter opens with a definition of competitiveness in firms and historical background on stages that determined competitive companies over time. The chapter also explores forces that determine competitiveness and strategies to achieve better performance. The chapter investigates methods and measures used to improve operational performance. The second half of the chapter presents a thorough review of quality awards and explores similarities and differences of several quality awards.
- Chapter 3 views competitiveness from a macro-level perspective. It introduces background on the Global Competitiveness Report Index as the measure used in this study. Then, the chapter presents the link between the competitiveness of a nation and the competitiveness of its organizations. After understanding similarities and differences among quality awards in Chapter 2, Chapter 3 analyzes and categorizes different types of changes and modifications made to different international quality awards. The chapter also shows a framework developed to guide the custodians of quality awards on which changes on national quality awards could lead to improved national competitiveness status. The chapter concludes with a case study of the Saudi Arabia King Abdul Aziz Quality Award and two examples of our implementation of the framework that will recognize weaknesses in the country's global competitiveness and make the desired changes to stimulate and strengthen these areas on an organizational level.
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market. Particularly, this research focuses on two known performance improvement tools: Six Sigma and Human Performance Technology (HPT). The chapter discusses both approaches in depth: definition, similarities, differences, and popularity. The chapter ends with recommendations on how to benefit from both approaches to improving operational competitiveness.

- Chapter 5 summarizes the research and the recommendations of the study. It also discusses assumptions and limitations of the study. That chapter closes with possible future research.

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CHAPTER 2 COMPETITIVENESS AND QUALITY AWARDS - REVIEW:

The framework presented in this research is an emergence of the topic of improving competitiveness of nations and their firms within the field of quality/business awards. This chapter presents a review for both topics. The first half of this review discusses the concept of competitiveness, and the second provides a review of quality awards.

2.1 Competitiveness:

There are two folds of competitiveness in terms of degree. The first is the degree to which the competitor desires to be as good as others. The second, however, is the degree to which the competitor desires to be the best at something. For an individual, firm, industry, or a country to achieve this, an understanding and measure of standing is required. For an individual to know where s/he stands, it is possible to have a scale of measurement depending on the activity. Firms compete more aggressively among themselves than do individuals due to the simple fact that firms have more resources. Stock price, market share, and net profits are three examples of measurements that companies use to determine where they stand in relation to the competition.

Competitiveness is a broad topic. Business communities focus on the competitiveness of a firm from economic, operational, and financial perspectives; it is a result of many interconnected processes and factors within a strategic framework. It is noted in the literature that a nation's competitiveness is a result of the competitiveness of all its national organizations. However, little research has been done to understand the link between the macro competitiveness level (i.e. a nation's competitiveness) and the micro competitiveness level (i.e. organizations within this nation) (Oral, 1993, 1999), (Karnani, 1985), (Cetindamar & Kilitcioglu, 2013).

Only a few contributions in the literature have discussed the concept of national competitiveness on the national level among countries, but those that have, have had significant

impact (Porter, 1980, 1985), (Hayes, 1984), (Hayes and Wheelwright, 1985). These contributions have led to adjustments on some known measures of competitiveness, such as the Global Competitiveness Index established by the World Economic Forum (WEF) and the World Competitiveness Yearbook established by the Institute for Management Development (IMD).

A firm's competitive advantage grows fundamentally out of the value a firm can provide to its buyers. It can be in the form of prices lower than that of competitors, or in a unique product which is better than a competitor's. Maintaining the competitive advantage a firm has is difficult because of the many factors that influence the firm and market. Factors such as the state of the economy, technological advancement, and the entry of new competitors into the market could put some firms out of business.

2.1.1 Competitiveness Paradigms:

Historically, there have been, over centuries, four paradigms to measure a firm's competitiveness: Craftsmanship, Productivity, Quality, and Immediacy. Each agenda has three elements: (1) Competitive edge which primarily answers the question, what is the goal? (2) Key characteristics of the paradigm; and (3) Basic need, what are the basic requirements that must be achieved? (Pace & Stephan, 1996).

- **Craftsmanship:** Centuries ago, competitiveness was entirely dependent on individuals' skills. Having a competitive edge means allowing no imperfections. Focusing on artfulness, the individual's skilful and artful hand was key--and most valued--in pre-industrial times. Production was low and processes were not standardized; rather, processes were artful and customized work. The best way to sustain competitiveness was to hire craftsmen who were more skilled and masterful than those of the competitors.

- **Productivity:** From the 1800s to around 1950, the focus of business turned to productivity. Manufacturing practices could break out of the constraints imposed by human production and into mass production. With this change, time study and standards were beginning to be established, and implementing these standards became a competitive advantage, especially in maintaining product quality and high production levels. The competitive edge was to have no shortages and to meet all demand. Firms started to focus on design production lines for large quantities.
- **Quality:** When firms had no issues with production and quantity, their focus changed to quality and customer satisfaction; their priority was to have no complaints. Excellence became popular in terms of perfect product and customer service. Many companies sustained their business because of customer loyalty and gaining a larger market share through quality. Terms such as “zero defects” and “customer is first” are heard more as goals and concepts in this era.
- **Immediacy:** With the revolution of information and high-speed delivery of data, it is becoming more and more important to deal with this revolution. Terms such as “Just-In-Time” are becoming popular among companies. Moreover, products and industries are more complex, and business-to-business (B2B) chains are longer. The cost of late deliveries is high, and this lateness would have a bullwhip effect on the entire chain. Because of this, the competitive edge for firms in this era is to have no delays (Pace & Stephan, 1996).

In today's aggressive competition, two central questions determine the choice of competitive strategy: first, how attractive is the industry for long-term profitability and the factors that determine it? and second, what determines the relative competitive position within an industry? Michael Porter answered both questions by presenting the five competitive forces

that determine long-term profitability of a firm and the three general strategies to achieve better performance (Porter, 1995). We expand our discussion by presenting them.

2.1.2 Forces That Determine Competitiveness:

In any business, there are forces that drive the competitiveness of a firm toward superiority in today's complicated operations. Specifically, those five forces are: new competitors' entrance into the market; substitutes which make similar products or services, the power of customers, the power of suppliers, and the competition among existing contestants. These forces are main influencers on prices, costs, and investment decisions of a firm. Each firm has to act and make decisions in order to prevent these forces from harming the business.

2.1.2.1 New Entrants:

New entrants that provide better products/services or that implement a more effective marketing strategy can influence the existing firm's profitability. New entrants can lead to "stealing" current customers or "preventing" future customers for the existing firm. However, there are measures an existing firm can take to create some barriers to new entrants' influence:

- If a firm can benefit from the concept of economies of scale, it can be competitive on cost and reduce the price to a level which new entrants cannot achieve. An example of this are firms which sell commodity products such as salt, where the market is already perfectly competitive and firms gain profit because of the economies of scale in the long run.
- Another entry barrier is the proprietary product differences. Firms can have exclusive rights to sell a product, which will make it difficult for competitors to enter the market. Many pharmaceutical companies have exclusive rights to their

product, which gives the firm a competitive advantage over other companies including new entrants.

- Brand identity becomes strong and powerful as time goes on, and firms should take advantage of this in order to prevent new entrants. Companies such as Pepsi and Coca-Cola have strong images, among other advantages, which make it difficult for new entrants in the soda industry. Strong brand identity also can give a firm a competitive advantage.
- Many new entrants to the market try to penetrate it by offering lower prices. It is possible for an existing firm to lower the price to be equal to the new entrant's price. It also possible to lower it to a lesser price which cannot be matched by the entrant. Some companies intentionally do this to a breakeven point between price and cost of a product or service. This strategy will exclude a new entrant from the market since the existing firm has the ability to handle the loss for a period of time, a situation the new entrant cannot withstand.
- A firm's access of distribution plays a key role in its success and profitability. A firm which has many distribution channels has a competitive advantage compared to other firms. This can be achieved by partnering and having strong cooperation with distributors. Procter & Gamble and Unilever are two examples of firms which have strong distribution channels worldwide, and they have achieved a stronghold which makes it difficult for new entrants to compete. In addition to distribution channels and points of sale, achieving an economical level of logistics and transportation can be a competitive advantage to existing firms. Operating transportation and information sharing efficiently will make it difficult for new

entrants to compete. One example is Walmart transportation and distribution operations. Walmart has its own transportation and distribution fleet and is operated efficiently where it minimizes costs and reduces the price of its products while maintaining the profit margin.

- Large firms have the desired capital requirements to expand and invest in projects. These projects can be new product/services, new market, and/or investments in new technologies. It is difficult for entrants to spend such capital, making the availability of capital required a competitive advantage for existing firms.
- On a global scope, many countries impose barriers on new entrants in favor of local firms. Government policies can also regulate high tariffs and taxes on new entrants, which makes competing in the market more challenging. Moreover, the political system and corruption can limit the entry to a new market.

New entrants are one force that has a significant influence on firms. Firms should always monitor and understand the market with all possible scenarios including what-if analysis for new entrants. This force makes a clear influence on firm's decisions and profitability.

2.1.2.2 Suppliers:

The second force which has influence over a firm's competitiveness and profitability is that of suppliers. All firms need suppliers, and the relationship with suppliers depends on the nature of the business. Retailers have hundreds or even thousands of suppliers from different locations. Even firms that mine raw materials from natural resources still need suppliers to provide them with the equipment needed for operations.

In today's global operations, products and services are more complicated, and the supply chain is longer than ever before. Still, firms can have a competitive edge by using the force of their

suppliers. Strong cooperation or partnership with suppliers is essential in maintaining a competitive advantage. Companies establish such partnerships and cooperations to secure the flow of raw materials in hard times. Some large firms buy suppliers at some point in time as a strategic decision to secure themselves and to impose barriers on competitors. Other firms today make clusters, which include all entities in the entire supply chain, from the company which extracts raw materials to processing all the way to placing it on the shelf for sale.

Other than securing its resources, the force of suppliers allows companies to have a competitive advantage over other competitors by providing differentiated inputs. Inputs with high-quality materials can have a better final product. For example, bottled water firms compete on the purity and clarity of the raw water from suppliers before processing.

On the other hand, suppliers in some cases hold power over firms. Supplier power can result from differentiation of its input. Firms will compete to have this input and the supplier gains the power of determining price. If a supplier has a limited capacity in its input, it can even put a status quota to be distributed to each firm. Another source of power of suppliers is the technological advancement of its inputs. Being ahead of the market in providing advanced machineries, for example, lends a supplier an advantage which companies must maneuver. Firms should also consider the sunk cost of not purchasing these inputs while competitors might take advantage and purchase them.

2.1.2.3 Substitutes:

Substitutes are products which meet the customers' requirements to serve the same function or purpose. Photographs, for example, used to be printed on film, but the digital form became a substitute to meet customers' needs which led to large losses for the photo film industry. As they

serve to supplant, substitutes necessarily influence firms' decisions and could become a strong force on the business.

There are three determinants of substitution threats:

- Relative price performance of substitutes: price is always one of the major factors that attracts customers to buy. If the consumer finds a product (or service) that serves the same functionality of another product he/she used to buy, it is expected that he or she will buy the cheaper one.
- Switching costs: switching costs is the process by which the customer can upgrade the purchased item or exchange it with a newer one by paying an amount less than purchasing the new product. This approach encourages the customer to buy from the company and prevents stealing existing customers by competitors. One example is the approach printer manufacturers implemented; the price of the printer itself is low and the marginal profits from selling printers is small, but the real benefit is from the sales of the printer's ink cartridges. Customers made the choice to buy the printer and continuously pay for the ink cartridges where competitors cannot intervene.
- Buyer propensity to substitute: buyers differ in their tendency to substitute and use different product and brands; some buyers prefer certain brands to others. There are two potential reasons for this: (1) from a consumer behavior perspective, some customers are not willing to buy a new product since they are already happy with the existing product. Some consumers' adoption rate of a new product or technology is low (Rogers, 2010). (2) Companies build strong bonds of loyalty with their customers, to a level where it is challenging for them to consider to consider new brands. For example, Harley Davidson consumers have a very high engagement and loyalty with the

company, which makes it difficult for other companies to compete (Solomon, 2009).
Which brings us to the fourth force on companies.

2.1.2.4 Buyers:

Buyers force emerges from their ability to bargain. Price is usually the main factor on which buyers push for reduction. However, one buyer does not have much effect on a firm as compared to a large group of buyers. A group of consumers could have an impact on a firm in certain situations. For example, when they buy large quantities which make up a large portion of the firms' sales, this group of buyers does have bargaining power since it will have a direct impact on the company's sales. Another example is when the amount paid consists of a large portion of the consumers' costs. In this case, the consumer will try to reduce his/her costs, and the decision will be more important to the consumer, which will lead to more bargaining pressure on firms to reduce price. Moreover, when the product is standard or undifferentiated, the consumer will have the power of choosing to buy other products from other companies. A fourth situation is when a company uses switching costs. In this case, the consumer will stop paying for upgrading or exchanging products and the loss to the company will be significant in the long term. Furthermore, when a company has low profits, it will have pressure from buyers who are less price sensitive. The sixth situation is when the product's quality is not as important to the end consumer as it is to the purpose for which it is used, such as test instruments and electronic medical equipment where it is vital to work properly and prevent errors for consumer operations. Finally, when the buyer is fully aware of the market, areas such as demand and actual market prices, this will enable the consumer to have a stronger bargaining power.

2.1.2.5 Intensity of Rivalry:

The nature of the market affects the intensity of the competition. A market is a group of buyers and sellers of a particular good or service. In economics, there are different types of markets. A competitive market is where many buyers and sellers trade similar products or services, and the market is open to new companies. This differs from a monopoly whereby a company is the only seller of the product or service without close substitutes, such as household water or electricity companies. Another type of markets is the monopolistic competition in which many firms sell products and/or services similar in function but not identical. An example of a monopolistic competition product is books where all companies sell books but have different content. Finally, there is a perfect competition market which includes the sale of products such as salt and sugar. A perfect competition market has many sellers of identical products (Mankiw, 2014).

Nevertheless, within a market, there are factors that have an influence on the firm due to rivalry among competitors. The influence is greatest when two competitors are mutually dependent. If two firms have a noticeable effect on each other, they are mutually dependent. According to (Porter, 1980), there are several factors that determine the intensity of rivalry among competitors:

- A stable market is where there are few market leaders, where medium and smaller companies follow leaders, especially in price determination. However, when there are many and equally balanced competitors, the level of competition increases until a stable market emerges with some companies becoming market leader(s), some medium-sized companies following and smaller companies either exiting or entering.

- If the industry is growing slowly, companies will have difficulty in expanding. A growing market will provide potential for companies to expand and maintain (or increase) the company's market share. However, when the market is growing slowly, or is stable with no growth, an expansion of the market share of any firm will be at the cost of competitors' shares. This will intensify competition between firms in the market.
- Fixed and/or storage costs are also a strong determinant of competition among companies. High costs consequently limit the profit margin and will affect pricing among competitors. The ability to have lower costs will provide the company a competitive advantage over competitors. Price is an important factor for consumers, especially if the product or service is of the same quality and provides the desired function.
- Another factor to determine the competition intensity in a market is a company's lack of differentiation. When products are similar and there is no product differentiation among companies, price becomes the only factor for consumers when making the buying decision. Such markets will have intense competition because of this lack of differentiation. Lack of switching costs, described earlier, will have the same effect.
- Some companies produce on a large scale of production increments to achieve the economies of scale level and lower costs. Competitors respond by doing the same, which creates a glut. This imbalance of supply and demand damages the market and puts pressures on all companies in the market to lower prices.
- The nature of industry operations and the decisions made by one firm can affect other companies and are also factors that lead to intensity in competition. Companies differ

in their culture and values. Sometimes a decision that is right for one company can harm another. Companies' strengths and values are different given that many foreign competitors enter the market. Some companies export their products to the market, and, because of their geographical locations, regulations, working environment, and even currency rates of exchange, can have a competitive advantage among local companies. Many firms from Asia have much lower labor costs than companies in the United States.

- Competition may also increase due to companies' strategic decisions to have a strong position in certain industries. Many companies want to have a strong position and presence in American markets and consider this a strategic goal even if the profits are not as high as expected.
- In some cases, competition increases because the cost of existing the market is high. High fixed costs or agreements can prevent a company from exiting the market, and make competing in the market a better choice.

But these five forces (power of new entrants, suppliers, buyers, substitutes, and rivals) should not prevent firms from being creative in having a competitive advantage and having better performance and market share. These forces are guidelines to management that should have an eye on staying in business and being competitive. In the following section, we will discuss strategies on how a firm can achieve better performance.

2.1.3 Strategies To Achieve Better Performance:

The second question to determine the choice of competitive strategy is what determines the relative competitive position within an industry? In other words, how can a firm achieve and sustain a competitive advantage? There are two types of competitive advantage any successful

firm can achieve: low cost, or differentiation. There are three strategies to achieve above-average performance through one of these two competitive advantages: cost leadership, differentiation, and focus.

2.1.3.1 Lower Cost Advantage:

One strategy to achieving better performance and a sustained competitive advantage is leading the market by having a *lower cost advantage*. Benefiting from economies of scale, proprietary technology, and/or lower cost raw materials, for example, gives a firm the desired level of lower cost and better profit margin and/or pricing flexibility. However, a cost leader cannot ignore the differentiation factor. If the product is not comparable to other products, the firm is forced to make discounts and sales will decrease. Moreover, cost leadership strategy could not be sustained if technology changes or if competitors were able to achieve the same low level of cost.

2.1.3.2 Differentiation:

Differentiation is the second strategy for above-average performance. Differentiation means that the product, or service, can provide unique functions particularly important to the customers where other products cannot provide the same function(s) or cannot function with the same efficacy for the customer. Customers usually pay a premium price for this uniqueness. Differentiation exists on the product's quality, durability, service, delivery, safety, image, and any other factor that could be important to the customer. A differentiated firm profit comes from the difference between the price premium consumers pay minus the extra cost of differentiation to the firm. As this difference between price premium and extra cost of differentiation increases, the profits also increase. Marketing efforts of the firm should focus on promoting the product to be perceived by the customer

at the desired price. In competitive markets, companies should have differentiated product(s) with attributes that are different among competitors. However, the market is dynamic and competitors will have the risk of either competitors imitating the differentiated attribute, or becoming less important to consumers over time.

2.1.3.2 Focus:

A different strategy from the other two mentioned above is *focus*. Focus differs from cost leadership and differentiation by selecting and focusing on a narrow marketing niche. One example is construction companies for megaprojects, such train networks or airport terminals. These companies focus on large projects, and governments are their major customers. Another example with a smaller scale of a marketing segment could be focusing on selling products for the disabled or those with special needs. Nevertheless, it is important to lead the market and provide highly differentiated products. Royal Crown focused on selling cola drinks, and Pepsi and Coca-Cola were competing with it in the same market. Pepsi and Coca-Cola were able to benefit from the economies of having other products for different segments other than simply the cola market. However, there are risks in implementing focus strategy as the marketing niche targeted may change over time, or their needs may change for any other reason (Porter, 1985). One example of this market niche are kids of a certain age, where consumers' ages and their needs change over time.

2.1.4 Methods To Improve Operational Competitiveness:

After understanding forces that determine a company's strategy to gain better competitiveness by achieving a competitive advantage over other companies, the topic of operational tools and methods that can help to improve competitiveness is detailed in this section. The question becomes: How can a firm improve its competitiveness? What models or frameworks

should firms use to improve their competitiveness in the organization's current development stage?

The literature provides a comparison among selected frameworks and models shown below in Table 1, including the model's main focus, usage, complexity, and stage at which a firm can put it to use (Ambastha & Momaya, 2004).

Model/ Framework	Main Focus of Model/Framework	Usage	Complexity	Stage of firm that can use it
Economic Value Added (EVA)	Financial – Cost of capital, profitability	High	Low	Survival and/or Growth
Value Pyramid	Productivity	Medium	Low	Survival and/or Growth
Total Shareholders' Return (TSR)	Value creation by cash value addition, economic growth	Low	Low to Medium	Growth
Value Chain Integration	Market value addition through value drivers, accounting value (assets and liabilities)	Low	Medium	Growth
Value Curve	Positioning by analyzing the margin and technology/ marketing complexity	Low to Medium	Low	Survival and/or Growth
European Foundation of Quality Management Award	Leadership (assets), processes and performance	Medium	Low	Growth
Capability Maturity Model	Process maturity levels	Medium to High	Low to Medium	Survival
Assets-Processes-Performance Framework	Company's internal assets, processes and performance	Low to Medium	Medium to High	Growth
Integrated Value Management	Corporate value creation through decision, incentive,	Low	Medium	Growth

	and communications.			
Balanced Score Card	Financial, internal business process, learning & growth and customers.	Low to Medium	Medium	Growth

Table 1. Measures/models that improve operational competitiveness. Source: (Ambastha & Momaya, 2004).

These tools help companies to make better decisions and provide support to achieve better competitiveness compared to other companies. We briefly introduce each tool:

2.1.4.1 Economic Value Added:

The Economic Value Added (EVA) is a financial measure to calculate the true economic profit of a firm. This measure considers the firm's profits after tax and potential investments of the firm. Mathematically, Economic Value Added is calculated as:

$$\text{EVA} = \text{Net Operating Profit After Tax (NOPAT)} - (\text{Capital} * \text{Cost of Capital})$$

The concept of Economic Value Added was developed by the corporate advisory team of Joel Stern and G. Bennet Stewart III in 1982. It is considered a successful financial measure because it takes into account the maximization of shareholders' wealth (Grant, 2003). The measure of EVA is very well known and is used by nearly all companies because it helps decision makers to have a better understanding of the options they have and those that are most advantageous to take. It is also easy to use and can be used at each and every level during the company's life cycle.

2.1.4.2 Value Pyramid:

The Value Pyramid is a tool that helps to improve productivity. This improvement is achieved by prioritizing values within the pyramid. The most important value

should be at the top of the pyramid. The Value Pyramid helps both employees and companies to understand the most important values and how to focus on them. Productivity is achieved by focusing on few yet critical values. The Value Pyramid is used quite often among companies because it is not a complex tool. It also can be implemented in a company's growth or survival stages.

2.1.4.3 Total Shareholder's Return (TSR):

Total Shareholder's Return is a measure to calculate the return to the investor. This return includes capital gains and dividends. It also can be interpreted as the internal return of cash flows during a certain period. Total Shareholder's Return is calculated as follows (Hill & Jones, 2008):

$$TSR = \frac{\text{Stock price } (t + 1) - \text{stock price}(t) + \text{sum of annual dividends per share}}{\text{Stock price}}$$

2.1.4.5 Value Chain Integration (VCI):

The concept of Value Chain was first stated by Michael Porter. He defines it as "a collection of activities that are performed to design, produce, market, deliver, and support its product" (Porter, 1985). Proper integration and alignment of the Value Chain provides a powerful tool for companies to improve their competitiveness and achieve their desired product or service value. VCI can be helpful for organizations in the growth stage, and it has a medium complexity level of implementation.

2.1.4.6 Value Curve:

Value Curve is a graphic representation that shows a company's relative level among key elements important to the industry (Kim & Mauborgne, 1999). It differs from Value Chain in that Value Curve examines the value of the company's products or services from an external perspective. It examines the industry and customers' perceptions about strategic factors which are important to business. Value Curve was first introduced by Kim & Mauborgne to answer the question, "How does the logic of value innovation translate into a company's offerings in the marketplace?" (Kim & Mauborgne, 1997). Value Curve helps firms to understand their position and competitiveness compared to rivals to have an unbiased picture of their products' strengths. Value Curve usage is low to medium, easy to use, and can help companies during their survival or growth stages. Figure 1 shows a sample Value Curve among three hypothetical competitors.

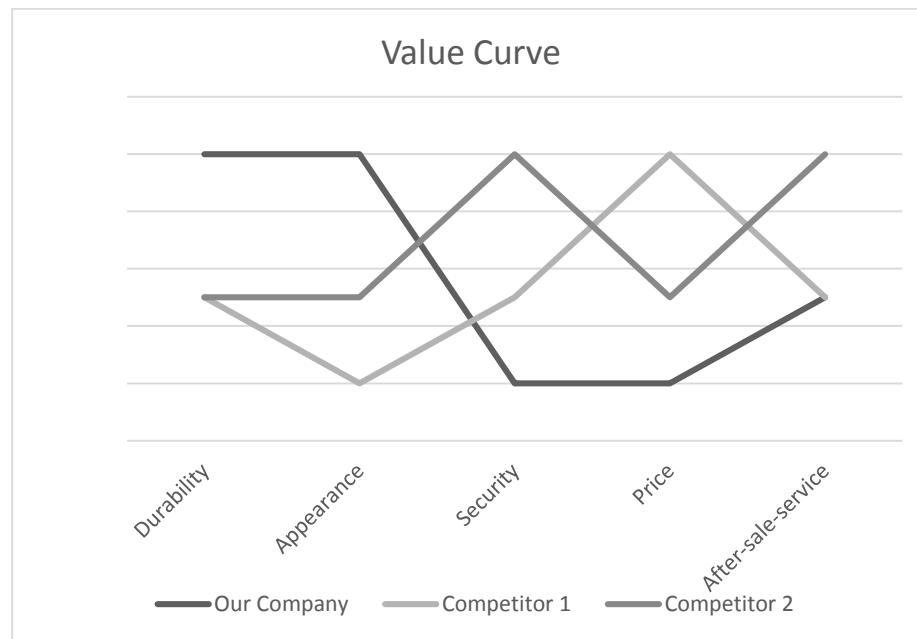


Figure 1. Example of Value Curve

2.1.4.7 *European Foundation of Quality Management Award (EFQM)*

Ambastha & Momaya mentioned the EFQM award as only one quality award model or framework to improve competitiveness as one of the frameworks and models that improve operational competitiveness (Ambastha & Momaya, 2004). However, all quality award systems are established to add value to the firm through its gaining competitiveness compared to other companies. Some examples, the Malcolm Baldrige Performance Excellence Award, Deming Prize, and other quality awards, will be discussed in later sections. Quality awards in general target improving the system performance and quality management in a broad definition.

2.1.4.8 *Capability Maturity Model (CMM):*

As its name indicates, is a method to evaluate and improve a firm's processes and ability to meet project objectives. More specifically, Capability Maturity Model was initially used to evaluate a software firms' ability to meet the requirements of U.S. government contracted projects (Humphrey, 2002). CMM has been succeeded by Capability Maturity Model Integration (CMMI) with continuous version updates. Moreover, the People CMM, Systems Engineering CMM, the Systems Security Engineering CMM, and ISO/IEC 15504 Process Assessment standards were also established from the original Capability Maturity Model (Paulk, 2009). The original model categorized each firm's processes, in terms of maturity, into one of five possible levels: Initial, Repeatable, Defined, Managed, and Optimizing (Humphrey, 1988). Table 2 shows the process evolution according to the Capability Maturity Model:

	Maturity Level	Explanation
<p style="text-align: center;">More Mature</p> <p style="text-align: center;">↑</p> <p style="text-align: center;">Less Mature</p>	Optimizing	At this level, the firm has established a foundation for continuous improvement and process optimization.
	Managed	The process is well understood with comprehensive and advanced measurements beyond performance cost and schedule. This level is where improvement begins.
	Defined	The process is well defined and performance is consistent and well understood. The process is ready for and can benefit from new technologies.
	Repeatable	The firm achieved stability and the process(es) is (are) in control by managing costs, schedules, and changes.
	Initial	The process is not mature enough, not to the level that it is statistically in control. Progress is not possible.

Table 2. Maturity levels according to the Capability Maturity Model. *Source (Humphrey, 1988)*

2.1.4.5 Assets-Processes-Performance framework:

The Assets- Processes- Performance framework is a tool used, mainly by governments and public sectors, to evaluate the performance of departments and service units. This evaluation includes all assets, including buildings, processes and the performance of the department. There are six performance areas in this framework: Appropriateness, Financial, Statutory compliance risk, Effective use, Environmental impact, and social significance. The Assets-Processes-Performance framework is not commonly used and is a subjective assessment that

requires experienced people to implement the assessment. It also best implemented in a firm's growth stage.

2.1.4.10 Integrated Value Management:

Beyond the principles of basic capital value measures and controls such as EVA and ROI, Strack & Villis incorporated managing human capital, customer capital, and supplier capital and introduced Integrated Value Management (IVM) (Strack & Villis, 2002). The Integrated Value Management included measures and controls for suppliers, customers, and employees in an attempt similar to the Balanced Score Card (to be discussed shortly). It provides broad key indicators that focus not only on not on capital value, but also on operational measures. Companies do not use IVM frequently, and it can benefit companies more during the growth stage.

2.1.4.11 Balanced Score Card:

In 1992, Kaplan & Norton published a paper at the HBR review journal introducing the concept of the Balanced Score Card. They explained that "The balanced scorecard is like the dials in an airplane cockpit: it gives managers complex information at a glance" (Kaplan & Norton, 1992). Indeed, the purpose is to translate a company's vision into strategy and action. There are four performance perspectives included in the Balanced Score Card: Financial perspective, Customer perspective, Internal Business Process perspective, and Learning and Growth perspective (Kaplan & Norton, 1996). The Balanced Score Card links operational goals through key performance indicators to the overall strategy of the company. It provides a competitive advantage to a company

through alignment with the desired strategy. Many companies implement the Balanced Score Card since it has a medium level of complexity and can be used best during a firm's growth stage.

More measures and models can improve a firm's operational competitiveness other than that which we have mentioned. Implementing these models will improve a firm's competitiveness and consequently improve national competitiveness. In this research, we focus on using Quality Awards models to improve competitiveness.

2.2 Quality Awards

2.2.1 Background

Quality Awards, or performance excellence awards, help companies to improve their performance and the country's profile as a whole (Tan, 2002). Not only can winners benefit from the award, but feedback from applications also has great value for applicants, which consequently benefits the economy (Hertz, 2012). This is in addition to the superior reputation that serves as a marketing tool for winners. It is also important to mention that one of the conditions imposed on companies which win the award is to present to other companies how they achieved that level of excellence. Sharing information is an added benefit for companies that want to improve their performance. Basically, award winners become a benchmark for other companies.

The concept of quality awards is not new. There are more than 100 quality awards in more than 80 countries (Talwar, 2011). Deming Prize, the first quality award, was established in 1951 (JUSE, accessed 2014). Malcolm Baldrige Quality Award was established according to the Malcolm Baldrige National Improvement Act of 1987 (www.nist.gov/Baldrige/about/history.dfm). The first European Foundation Quality Model Award was granted in 1992 in Madrid (EFQM, accessed 2014). Most quality award models are adopted from these three. 25.2% of quality

awards are adopted from the Baldrige Excellence Award model, 7.5% of awards are adopted from Deming Prize model, and the majority of 42.1% of awards are adopted from European Excellence Award model, while the rest have their own unique and self-developed models (Lee & Lee, 2012).

2.2.2 Similarities and Differences

Many studies have compared quality awards from different aspects. One of the first attempts to compare quality awards analyzed the three major quality awards, Deming Prize, Malcolm Baldrige Quality Award, and the European Foundation Quality Award. It concluded that each award has its own unique system, assessment criteria and weights, and framework (Bohoris, 1995). Most studies have agreed that each award has its own unique system but also stays within Total Quality Management (TQM) principles (Ghobadian and Woo, 1996) (Vokurka, Stadling, and Brazeal, 2000) (kumar, 2007). Table 3 summarizes some of the contributions in the literature on the topic of similarities and differences between quality awards, in chronological order.

Table 3 Recent research contributions on quality awards similarities and differences.

Study	Purpose	Results
(Bohoris, 1995)	Reviewed and compared three major awards.	Found that each award has its own unique system, examination criteria, and framework.
(Ghobadian and Woo, 1996)	Described and compared four major awards according to five categories: application categories, underlying framework, examination criteria, application procedures, and scoring methods.	<ul style="list-style-type: none"> ▪ Quality Awards are beneficial, and their framework represents TQM principles. ▪ Companies benefit from self-assessments even if they do not win the award. ▪ Awards differ in their individual characteristics, but promote quality.
(Puay, Tan, Xieand, and Goh, 1998)	Identified similarities and differences between nine quality awards.	<ul style="list-style-type: none"> ▪ Compared award frameworks' weighting criteria for the nine awards.

(Tan and Lim, 2000)	Compared similarities and differences of 17 national quality awards in terms of structure and content. Then provided guidelines to assist in the creation of new awards.	<ul style="list-style-type: none"> ▪ Provided a comparison of awards' weights assigned to Impact to society, Results, Customer management and Satisfaction. ▪ Showed the emphasis of these awards, weighting criteria focus, and similarities to the major quality awards. ▪ Indicated that maintaining these awards and updating them according to the economic, social and political climate of the country is essential for the country's growth.
(Vokurka, Stading, and Brazeal, 2000)	Compared four national and regional quality awards.	Showed that these four awards are similar in requirements by linking each award's requirement to the seven major criteria of MBNQA.
(Kay C. Tan, 2002)	Discussed background and similarities and differences of 16 quality awards.	Studied factors that influence award development, government and private sector, model adoption, and others.
(Khoo and Tan, 2003)	Compared MBNQA and Japanese awards, DP and JQA, despite their cultural differences and explored similarities within TQM framework.	Through awards framework, Americans focus on creating an entrepreneurial culture and technological innovations, and diversity. Japanese culture emphasizes shared decisions and cooperative processes to achieve high standards.
(Tan, Wong, Mehta, and Khoo, 2003)	(1) Compared 53 National Quality Awards. (2) Provided guidelines for establishing quality awards.	Recommendations and suggestions were made, based on several factors, such as government and private sector partnership, administering organization, determination of the number of awards to be presented annually, and other factors.

(Kumar, 2007)	Studied similarities and differences of MBNQA and DP over a period of 13 years.	Although DP and MBNQA differ in approach regarding how to implement TQM, they are similar in understanding the concept of TQM.
(Maroidis, Toliopoulou, and Agoritsas, 2007)	Examined European countries' awards and the need to change each award's criteria according to each country's economic and social needs.	All countries have developed their awards for almost the same purpose and according to the country's political status, law, interaction between public and private sectors, and administrative philosophy.
(Talwar, 2011)	Reviewed the evolution of quality awards with a comparative view of 100 awards.	The research of quality helped the establishment of quality awards. Still, changes needed to be made; it is important to consider sustainability and social consequences in the award.
(Alonso-Almeida and Fuentes-Frias, 2012)	Examined 37 quality awards to find a structure for quality awards at any geographical location despite geographical and cultural differences.	Through cluster analysis, the study found that six necessary dimensions must be met for every quality award.
(Lee & Lee, 2012)	Examined the evolution and criteria of six national quality awards.	The number of manufacturing companies applying for MBNQA is decreasing steadily, while the number of educational and health care institutes is increasing. On the other hand, the number of manufacturing companies applying for EFQM is relatively stable.

2.2.3 Effectiveness of Quality Awards

Researchers have also discussed quality awards' effectiveness with more focus on the awards' financial impact. Hendricks and Singhal examined the effect of winning a quality award on a firm's stock price on the day of the winners' announcement. They found that the stock market

reacts positively to the announcement of the award, especially for small business companies (Hendricks and Singhal, 1996). Hendricks and Singhal extended their work and tested the hypothesis that companies which have won the Malcolm Baldrige National Quality award outperformed other companies during a 10-year period, starting six years before winning and continuing through the three years after winning their first award. They found significant evidence to support the hypothesis in two parameters: operating income with a mean change of 107% and sales growth with a mean change of 64%, compared to the control sample. They also found a 20% increase in favor of award winners in the ratio of operating income to sales, to assets, and to employees. More recently, in 2013, Boulter, Bendell, and Dahlgaard used the same approach which Hendricks and Singhal used on Malcolm Baldrige Quality award on the European Quality Award. They also found that companies which have won quality awards outperformed other companies in the stock market (Boulter, Bendell, and Dahlgaard, 2013). Moreover, another study has examined companies that won Spanish quality awards and the European Quality Award and found that winners have higher average profitability in the period before winning the award. The study also showed that the gap between winners and the control sample is higher for companies that have won the European Quality Award compared to regional and national quality awards (Corredor and goni, 2010). More precisely, firms that win quality awards perform significantly better than similar companies of the same size and in the same industry (Jacob, Madu, and Tang, 2004). However, in the case of Deming Prize, winning is not always financially beneficial. In fact, there is a negative relationship between winning the award and the firm's financial performance (Iaquinto, 1999).

Most studies have examined the effectiveness of quality awards from the perspective of their financial impact. However, the purpose of establishing quality awards is not purely financial as they present other benefits for the economy as a whole. The Malcolm Baldrige mission is:

“To improve the competitiveness and performance of U.D. organizations for the benefit of all U.S. residents, the Baldrige Performance Excellence Program is a customer-focused federal change agent that... Provide global leadership in the learning and sharing of successful strategies and performance practices, principles, and methodologies”. (<http://www.nist.gov/baldrige/about/>).

So, the financial impact is to be expected and might have a long-term impact, but it is not the main objective and should not be an indicator for the overall effectiveness of the award. In fact, there are other studies in the literature which showed the benefits of quality awards beyond their financial impact. For example, the social benefit-to-cost ratio for the American Society of Quality members is 207:1 due to their adoption of the Malcolm Baldrige Performance Excellence Program (Link and Scott, 2006). Furthermore, government sectors can benefit from having regional awards to improve their services. The Malcolm Baldrige Quality model is a reliable assessment tool for municipal governments (Prybutok, Zhang, and Peak, 2011). Another intangible factor for the effectiveness of quality awards is the benefit from using the model without applying for the award.

Recently, several studies have questioned the benefits and future direction of quality awards. The American federal government considered eliminating the Baldrige Performance Excellence, yet the research suggests it would be a mistake to do so (Jacob, Madu, and Tang, 2012). Several studies have proposed one unified model for all quality models (Yang, 2009), (Ringrose, 2013), (Pun, Chin, Lau, 1999). Other topics have been discussed in the literature, such as excellence sustainability for winning companies (Talwar, 2011), model causal relationships (Wilson & collier, 2000), (Boulusar, Excrig-Tena, Puig, and Beltran-martin, 2009), and award model weighing criteria (Tan & Lim, 2000), (Eskildsen, Kristensen, and Juhl, 2001).

Previous studies covered almost all aspects of quality awards, but little research has been done on: (1) the link between quality awards' effectiveness on the ultimate result for which it has been established, i.e. improving the economy and increasing the country's competitiveness,(2) how quality awards are revised, and (3) whether or not quality awards can be used as incentive tools to improve national competitiveness. The aim of this research is to provide a general framework on how to answer these questions using GCI report as a reference to measure a country's competitiveness. Understanding the macro-level picture of quality awards and linking it to the nation's economy and competitiveness will provide a different perspective and added value to quality awards. It will also help the custodians of these awards to determine the national competitiveness needs in order to make adjustments on the award criteria that will be aligned with the country's competitiveness goals.

CHAPTER 3: MACRO-LEVEL VIEW: IMPROVING COMPETITIVENESS USING A QUALITY AWARD PDCA SYSTEM

3.1 Introduction

On a macro level, governments strive to have better economic growth and competitiveness with an ultimate goal toward the prosperity of their citizens. The World Economic Forum issues a Global Competitiveness Index (GCI) report every year to inform governments on their competitiveness level as compared to other countries. Most countries participate in the World Economic Forum and are included in the GCI report. This well-known report ranks countries according to competitiveness factors. Many countries have established competitiveness centers to cooperate, coordinate, and improve their national competitiveness according to the report results.

On an organizational level, governments and non-profit organizations establish many initiatives to assist companies in improving their performance. The goal of these initiatives is to improve the country's economy and competitiveness by encouraging companies to achieve higher levels of improvement and excellence. One of these initiatives is the establishment of quality awards.

Today, there are more than 100 quality awards in more than 82 countries (Talwar, 2011). Each quality award has a model. A quality award model, or performance excellence model, is a tool companies can use to evaluate and improve their performance toward excellence. The most recognized quality awards are: Deming Prize, Baldrige Performance Excellence Award, and the European Quality Award. The way in which quality awards improve an organization is almost identical among awards. Identification of areas of improvement is achieved by self-assessment or by applying for the award and gaining outside experts' feedback against the award's criteria. Organizations then improve by devising plans of action or corrective actions according to feedback received.

The scope of global competitiveness is broader than the scope of organizational excellence. Nonetheless, can quality awards affect a nation's competitiveness? The achievements of the companies and

organizations within a nation are what constitute its national competitiveness. Most quality awards are sponsored by government organizations and/or non-profit organizations. These governments also have the aim and responsibility to improve the country's economy and competitiveness. Is there a relationship between performance excellence awards and the nation's competitiveness? Is it possible for quality award custodians to improve nations' competitiveness by making changes to the award's criteria or weights?

Many quality awards are revised regularly, usually every three to seven years. Little attention has been given to how these revisions are made, especially concerning how quality awards affect the nation's competitiveness and economic growth. The ability to link quality award criteria on an organizational level to a nation's competitiveness will help quality award custodians to have a better means of determining what changes to make on the criteria of the award when revised. Including competitiveness elements on the quality award criteria will help governments to achieve better national competitiveness results. This is, of course, in addition to achieving excellence for these organizations. Broadening the scope of quality is nothing new. Traditionally, the historical progress of quality movement has begun by focusing first on product quality improvement, then on process quality improvement, and finally on organizational quality improvement. Is it now time for country quality improvement?

As mentioned in Chapter 2, the literature has discussed quality awards from different aspects: award effectiveness, model causal relationships, and similarities and differences, among others. Yet, few studies have discussed the effect of quality awards on the national economy as a whole and the role of quality awards on the nation's competitiveness on a macro level. In this study, a framework that links quality awards' criteria to the national competitiveness is proposed, using the GCI report elements since it is the best known and most comprehensive index. Moreover, a systematic framework to guide award custodians on which changes to make to the award criteria in order to improve national competitiveness is also presented. Finally, two examples of which changes to the criteria of the Saudi quality award, named the King Abdulaziz Quality Award, are suggested to improve Saudi Arabia's competitiveness. However, first the competitiveness measure used in this study, Global Competitiveness Index, is introduced.

3.2 The Global Competitiveness Index Report

The World Economic Forum issues the GCI Report, which is published by Oxford University Press (Lall, 2001). This section presents a historical background of the World Economic Forum.

In 1971, the European Management Forum was created in Davos, Switzerland to “*promote events that serve a closer cooperation of the international, and in particular the European industry*” (The world Economic Forum, 2009). In 1975, the number of participants in the symposium increased to 860 (compared to 440 participants in 197), including CEOs of major European countries such as Royal Dutch Shell, Unilever, and Philips. In this year, the first official cooperation with UNIDO (the United Nations Industrial Development Organization) was made. In addition, the forum went global with the participation of a non-European country, Mexico.

The first report on the Competitiveness of European Industry, which later became Global Competitiveness Report, was published in 1979. By the end of the year, several round tables had been held in Washington D.C. and Latin America. China’s first participation in the forum was in this same year. In 1980, the second edition of the Competitiveness Report included Japan, the United States, and Canada for the first time. The name of the forum was changed to “World Economic Forum” in 1987. The number of members has been expanding; 800 companies’ CEOs, 150 political leaders, and 200 academic scholars participated in 1993.

Klaus Schwab, founder and president of the World Economic Forum, proposed the “Leadership Hexagon” for business and political leaders in 1993. The forum continued to be held yearly, having global and regional summits that encouraged discussion between political, academic, media, and business leaders. In 2001, the World Economic Forum created numerous initiatives, such as: Global Competitiveness Report, Digital Readiness Report, Global Corporate Citizenship Initiative, Corporate Performance Initiative, Global Governance Report, and others (The World Economic Forum, 2009). In 2004, the first Global Competitive Index (GCI) report was conducted, measuring the national competitiveness of more than 140 countries

considering micro- and macroeconomic foundations of nations' competitiveness (Sala-I-martin, Blanke, Hanouz, Geiger, Mia, & Paua, 2007).

The World Economic Forum was able to successfully blend politicians, executives, professors, and the media into a single community that aims to provide better prosperity for nations' citizens. The World Economic Forum took many initiatives to achieve better economic, social, and political decisions. One of these initiatives that helped nations is the GCI report.

The World Economic Forum defines competitiveness as "the set of institutions, policies, and factors that determine the productivity of a country." (Sala-I-Martin, Blanke, Hanouz, Geiger, & Fiona Paua, 2008). The index depends on productivity as the main driver for nations' prosperity. The GCI report provides a comprehensive view of the micro- and macroeconomic foundations of countries' national competitiveness (Schwab, 2012). The first GCI was released in 2005 and was prepared by the Oxford University Press within the scope of Jeffrey Sachs and Michael Porter's research work in competitiveness (Lall, 2001). In 2008, a unified index was presented under the leadership of Michael Porter (Porter, Delgado, Ketels, & Stern, 2008). Data are collected according to surveys distributed in each country. The report then ranks countries according to three states, each state having pillars amounting to an overall 12 pillars with weighted percentages. The first state is *Basic Requirements*, which is composed of four pillars: Institutions (25%), Infrastructure (25%), Macroeconomic Environment (25%), Health & Primary Education (25%). These pillars are key for factor-driven economies. The *Efficiency Enhancers* is the second state and contains six pillars: Higher Education and Training (17%), Goods Market Efficiency (17%), Labor Market Efficiency (17%), Financial Market Development (17%), Technological Readiness (17%), and Market Size (17%). These pillars are key for efficiency-driven economies. The third state is *Innovation and Sophistication factors* and has two pillars: Business Sophistication (50%), and Research & Development Innovation (50%), and these pillars are fundamental for innovation-driven economies (Schwab, 2012). The report shows a score for each of these factors and sub-factors in addition to the country's ranking compared to other countries. The report also classifies each country to be in, or between, three economical stages:

Factor-driven Economy, Efficiency-driven Economy, and Innovation-driven Economy. Table 4 shows states, pillars, and stages of the GCI.

Each pillar in the GCI has a weighted sub-index, and the total of these sub-indexes under each pillar amounts to 100 point. For example, pillar 10: market size has two sub-indexes, domestic market size with 75% and foreign market size with 25%. The total sub-indexes and sections of the report are 119 sub-indexes. A complete list of all indexes and sub-indexes of the GCI is attached in Appendix A.

Table 4. Global Competitiveness Index states, pillars, and stages.

Global Competitiveness Index		
Basic Requirements	Efficiency Enhancers	Innovation and Sophistication
1. Institutions	5. Higher Education	11. Business
2. Infrastructure	6. Goods Market Efficiency	Sophistication
3. Macroeconomic Environment	7. Labor Market Efficiency	12. Innovation
4. Health and Primary Education	9. Technological Readiness	
	10. Market Size	
Key for Factor-driven Economies	Key for Efficiency-driven Economies	Key for Innovation-driven Economies

3.3 The Big Picture

In this section, a framework that illustrates the relationship between an organization's excellence, through quality awards' criteria, and the country's competitiveness is presented. The importance of this section lies within the scope of how countries can benefit from the GCI results to improve the quality award criteria and improve the country's competitiveness. It is a systematic approach according to the Plan-Do-Check-Act cycle. The principal fact to consider in this section is that one of the purposes for which governments and agencies have established quality awards is to improve the overall national competitiveness of the country by improving companies' strides toward excellence. The quality award

model is one tool which governments can use to improve their competitiveness, in addition to other initiatives. This can be implemented by the dynamic and consistent changes made in quality awards criteria. GCI results are the output, and the criteria of the quality awards are one of the tools through which countries can control the direction of their progress. The concept of the relationship between quality awards and the country's global competitiveness is shown in Figure 2.

The custodians of the award, usually governments or non-profit organizations, set the criteria for the award. The award criteria provide guidelines to companies on how to reach better performance excellence. First, companies adopt and evaluate themselves against the award criteria. Then, companies have the option of applying for the award or using it as a guideline for their internal improvement. In fact, thousands of companies use quality award criteria to evaluate themselves with regards to business excellence (Dodangeh & rosnah, 2013). In the case of applying for the award, experts from the award panel evaluate the company according to information provided to them. After preliminary evaluation of documents, award judges and experts visit the organization to evaluate it as a potential winner. Then, the company is given detailed feedback on its performance. Many companies see this feedback as the real benefit of applying for the award. The winners are then announced at an annual event, given that these companies will share some of their information on how to achieve excellence in order to help other companies succeed.

The framework presented in this paper expands the effect of quality awards beyond the scope of companies' business excellence on the national level to that of the global level of the country's competitiveness.

The framework consists of three improvement levels: organizational improvement level, national excellence level, and global competitiveness improvement level.

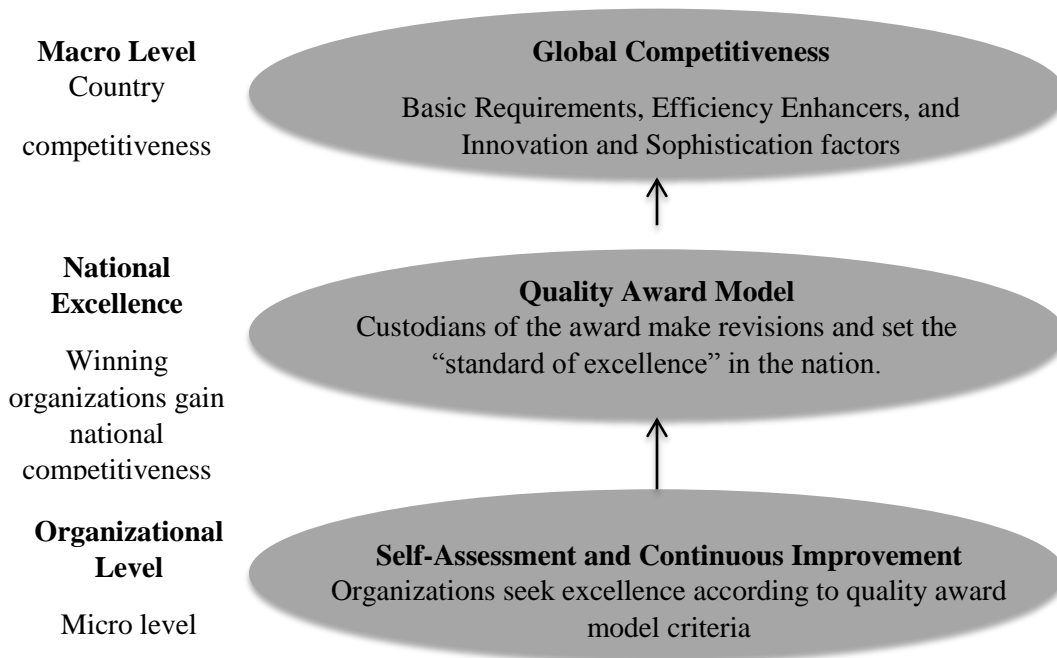


Figure 2. Levels from organizational excellence to national competitiveness.

3.3.1 Organizational improvement

One of the decisions that a company makes in order to seek improvement is to evaluate itself against the quality award model. Companies self-assess or have an outside expert that provide feedback by applying the criteria of the award to their performance. Then, using the many different tools and methods, companies make improvement. Tools and methodologies such as: statistical quality control tools, lean, Six Sigma, customer feedback, Plan-Do-Check-Act cycle, among other tools, are used to make the desired improvements. When organizations improve, they advance to a higher level of excellence, gaining a competitive advantage over other companies. This is especially true for developing countries (Tan, 2002). The relationship between organizations and the custodians of the awards exist through: (1) setting the excellence model, (2) providing feedback to organizations by identifying areas of improvement, and (3) making improvements through the implementation of action plans.

3.3.2 National Excellence

Quality awards (or Business Excellence Awards) model are the standard definition of “organizational excellence” in every country. Although the majority of quality award models share many similarities, there are also differences. More information on the matter is provided in Table 3 in Chapter 2. Some national awards focus on certain industries more than others. For example, Baldrige Performance Excellence award has a designated award for Education and Health care organizations. The differences in the scope of quality awards could be found in the targeted industry such as: Small and Medium Size Enterprises (SME), Services, Manufacturing, and others. Differences can also be seen in the model itself by its giving more weight to certain indexes in the criteria or having more factors to consider, such as environmental issues, focus on local employees, etc.... Quality award model is seen as a controlling device which governments can use to drive companies to performance excellence. The model consequently will have an effect on the country’s competitiveness as a nation in comparison to others.

So far, there is no clear systematic methodology on how award custodians review the model criteria for new revisions in the literature. This framework proposes implementing such a relationship. The GCI report provides detailed feedback on where a country stands in many aspects. Quality award custodians can benefit from this report to make changes to the award criteria and consequently make improvements on each nation’s competitiveness.

3.3.3 Global Competitiveness

Within a given country, as the number of organizations following the quality award model increases, the country’s competitiveness should also increase. After all, all nations consist of organizations in different industries and for different purposes (including non-profit organizations) which achieve prosperity for the state. The GCI report is issued every year and incorporates numerous factors that can be controlled by making changes to the quality award model. The GCI report identifies weaknesses in the

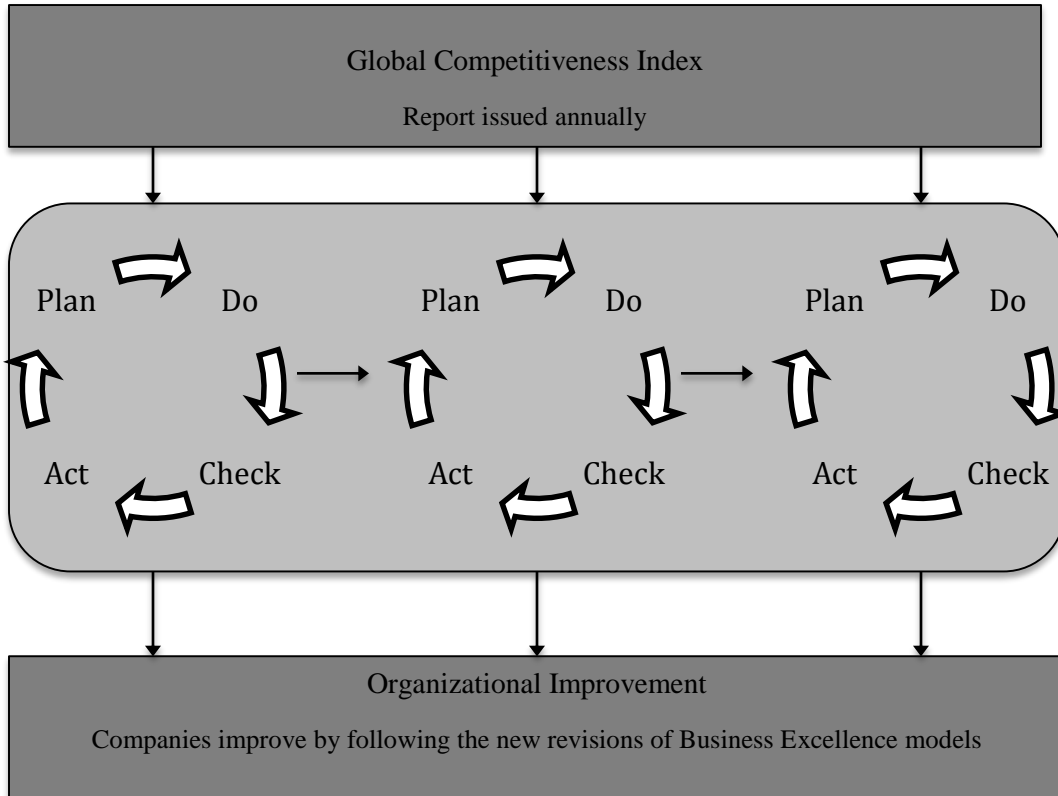
nation's competitiveness and areas of improvement to consider. This index was used because it is the most comprehensive.

3.4 Quality Award PDCA Framework To Improve National Competitiveness

The cycle provides a closed system with a feedback loop from a broad level to the narrow organizational level based on PDCA cycle. The process owner of this cycle is the award custodian committee. The completion of one PDCA cycle is within the time interval of the award revisions. These steps are explained as follows (figure 3):

1. **Plan:** The custodians of quality (or business excellence) awards set the required criteria for defining excellence that will improve an organization's performance. Organizations which apply and follow the award criteria will be able to achieve better performance and to move toward excellence. It is expected that the country's competitiveness will improve as its organizations do.
2. **Do:** Here, organizations follow the award criteria, either through self-assessment or through applying for the award and being rated by award judges and evaluators. Areas of improvement are identified and corrected.
3. **Check:** The custodians of the award will check the country's GCI results, identifying weaknesses in the nation's competitiveness and ways to improve it. This checking phase attempts to answer the question: What is the country's competitiveness score and ranking, and where should improvements be made to the model criteria?

4. **Act:** This involves making the desired changes to the award criteria. What changes are required for the definition of excellence (i.e. award criteria) in order to achieve better competitiveness for the nation in the following years?



After each cycle (3-5 years), a new revision of the business excellence model is made. The new revision modifies the model according to global competitiveness requirements of the nation.

Figure 3. PDCA framework to improve global competitiveness using quality awards.

On one hand, the main purpose of establishing quality awards is to improve the economy and the competitiveness of the nation through providing guidelines to companies on how to perform better. On the other, the chief purpose of the GCI is to provide a sense of the country's ability to improve its prosperity. In fact, "Governments should act as a catalyst, helping companies to improve their competitive position" (Snowdon and Stonehouse, 2006). However, both quality awards and competitiveness index parameters and results are controlled by the efforts made by the government. In addition, there are no clear instructions

or guidelines on just how the custodians of quality awards make changes to the award criteria. In this section, the elements and requirements of quality awards are investigated to determine how they can affect some of the elements of the GCI. But first, the concept of changes that can be made on the quality awards requirements will be introduced.

This model will provide award custodians with a better understanding of the country's overall performance. Presented here is a dynamic framework for improvement with the same time intervals for current award criteria revisions.

3.5 Types of Quality Award Model Changes and Modifications:

Before explaining this example of how to use the proposed framework, the types of changes that quality award custodians can make to the criteria in order to improve competitiveness will be discussed. These changes are based on the types of modifications award custodians have made in different countries historically. Quality award requirements are revised over time intervals, usually between two to six years. Changes differ according to the purposes they serve. Understanding which modifications can be made to quality awards will make clear how the award model can affect the nation's competitiveness elements in the GCI report. Changes and modifications on quality awards' revisions can be categorized into the following:

3.5.1 Vertical modifications

Vertical modifications are changes made within the criteria themselves. These changes can be amendments to an index or sub-index in the criteria, adding or removing an index or sub-index, or changes in the score weights of an index or sub-index. Changes can also be made by moving subindexes under other indexes (Lee, Zuckweiler, & Trimi, 2006). Quality awards in South Africa, Columbia, Costa Rica, and other countries have included ISO14000 environmental management system requirements in the quality award criteria as

a means of enhancing environmental management for organizations. (Tan, Wong, Mehta, and Khoo, 2003).

3.5.2 Horizontal modifications

Horizontal modifications to the award can also be made. These changes occur when an award is assigned to a specific industry. For example, the Malcolm Baldrige Quality Award was initially for manufacturing and service industries before it included other industries: small business, education, health care, and non-profit (including government and public organizations). Such expansion in the scope comes with a set of specific requirements and criteria for each industry.

Now that the changes which can be made to the quality award model or criteria have been identified, the proposed example of how this framework can be implemented will be discussed. But first, an introduction to the quality award and its historical background is necessary. Figure 4 summarizes the classification of vertical and horizontal modifications.

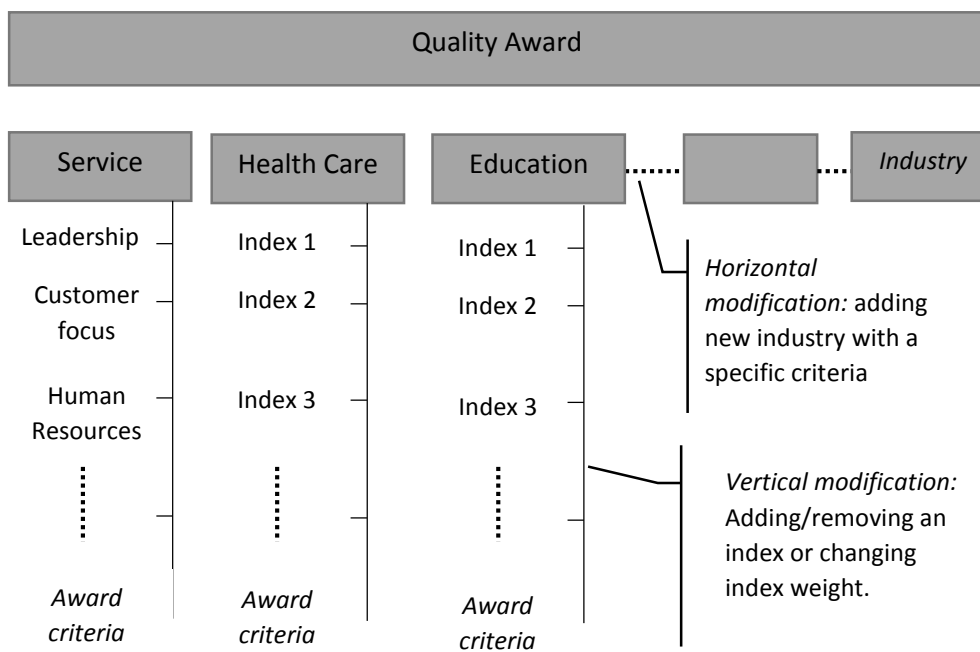


Figure 4. Vertical and Horizontal modifications on quality awards.

3.6 CASE STUDY: SAUDI ARABIA

In this section, we implement our PDCA framework on the results of Saudi Arabia. But first, we introduce the Saudi Arabian Quality Award, King Abdulaziz Quality Award (KAQA).

3.6.1 King Abdulaziz Quality Award (KAQA):

King Abdulaziz Quality Award is the national quality award in the Kingdom of Saudi Arabia. It was approved and sponsored by the Saudi Arabian King on March 3, 2000. The award committee structurally reports to the governor of the Saudi Arabian Standards, Metrology and Quality Organization (SASO), which reports to the Saudi Ministry of Commerce and Industry. Since then, there have been two rounds and the winners were declared twice. The goal of the award is to enhance service and production sectors in order to adopt total quality management basics and principles. It also helps organizations to increase quality levels and to improve their ability to compete globally. Quality awards stimulate continuous improvement for the performance of different sectors and honor the best organizations which demonstrate outstanding performance.

Presented below are the award criteria of the current document, which is the first edition, third revision and was issued on September 2011. There are eight categories upon which organizations are evaluated in KAQA, which has an overall score of 1000: Management Leadership (120 points), Strategic Planning (80 points), Human Resources (100 points), Suppliers and Partners (80 points), Operations Management (170 points), Customer Focus (90 points), Social Involvement and Influence on the Community (60 points), and Business Results (300 points) (King Abdulaziz Quality Award, Sept 2011).

Management Leadership is divided to three parameters: Top Management's Direction (40 points), Reviewing the Organization's Performance (40 points), and Enhancing Quality Culture and its Dissemination (40 points). The second pillar is Strategic Management. Eighty points are given to three parameters: Strategic Planning Management Process (40 points), Strategic Goals and Business Plan (20 points), and Research and Development (20 points). Human Resources is focused on highly, with 100 points

as the third pillar in the award. The criteria have 20 points for Human Resources planning and selection. Another 20 points are for Training and Education, 15 points for Employee Performance and Appreciation, 15 points for Employee Satisfaction and Working Environment, 15 points for Employee Involvement, and 15 points for “Localization”, that is, for recruiting Saudi citizens. The fourth element is Suppliers and Partners and is weighted at 80 points: 30 points is for choosing, evaluating, and improving suppliers’ quality services; 20 points for focusing on local suppliers and products; and 30 points for long-term agreements and partnership management. The second highest weight in this award is given to Operations management with 170 points: 100 points for quality, environment, energy, health and occupational safety management systems; 50 points for continuous improvement, and 20 points for the implementation of Saudi and International standards. The sixth pillar is Customer Focus and is weighted at 90 points. These points are divided equally (i.e. thirty points each) for: Understanding Customers and Market, Customer Relationship Management (CRM), and Customer Satisfaction Measurement and Enforcement. 60 points are weighted for the seventh pillar of the criteria, Influence on Society. 20 points are for the company’s Participation in National Development, 20 points for Social Responsibility, and 20 points for Participation in Training and Educating Society. The highest weight, 300 points, in this award is given to the last pillar: Business Results. Stakeholder satisfaction has 80 points, Financial Results has seventy points, Human Results has 50 points, Suppliers and Partners has 50 points, Investing in Research and Development has 25 points, and finally, Exporting has 25 points. Table 5 summarizes the criteria of King Abdulaziz Quality Award.

Table 5. King AbdulAziz Quality Award (KAQA) criteria.

KAQA Criteria (1000 points total)	
1. Management Leadership (120) 1.1 Top Management Direction (40) 1.2 Performance review (40) 1.3 Promotion and spread of quality culture (40)	5. Operations management (170) 5.1 Quality, Environment, Energy, Safety and Occupational Safety management systems (100) 5.2 Continuous Improvement (50) 5.3 Implementation of Saudi and/or International standards (20)
2. Strategic Planning (80) 2.1 Strategic planning management process (40)	6. Customer focus (90) 6.1 Understanding market and shareholders (30)

2.2 Strategic goals & business plan (20)	6.2 Customer Relations management (30)
2.3 Research & Development (20)	6.3 Measurement & enhancing customer satisfaction (30)
3. Human Resources (100)	7. Influence on society (60)
3.1 Human resource planning and selection (20)	7.1 Contribution in national development (20)
3.2 Training and Education (20)	7.2 Social responsibility (20)
3.3 Performance and recognition (15)	7.3 Participation in training and educating the society (20)
3.4 Employees satisfaction & Work environment (15)	8. Business results (300)
3.5 Employees involvement (15)	8.1 Customer satisfaction (80)
3.6 Localization (Saudization) (15)	8.2 Financial results (70)
4. Partnership and Suppliers (80)	8.3 Human resources (50)
4.1 Suppliers selection, evaluation, and supplier quality (30)	8.4 Partners/suppliers (50)
4.2 Focus on local product and suppliers (20)	8.5 Investment in Research and Development (25)
4.3 Partnership & long-term agreements management (30)	8.6 Exporting (25)

In its first round, in 2008, 102 companies had applied for the award. Small companies were excluded, so the number of companies which ultimately applied totaled 72. The award committee provided orientation training for award criteria to at least three employees at those 72 companies. After thorough evaluation, 22 companies were finalists. The award had four categories: large service companies, large manufacturing companies, medium-manufacturing companies, and medium services companies. A site visit was made to 16 companies, after which 6 were excluded.

The winners of the first round of King Award Abdulaziz Award were announced at a public event. Saudi Telecom Company (STC) won the award for the large service companies sector, Al-Jubail Petrochemical Company (KEMYA), one of the manufacturing affiliates with the Saudi Arabian Basic Industries Company (SABIC), won it for the large manufacturing companies with Advanced Electronics Company, and Savola Packaging systems did so for the medium-manufacturing companies. There was no winner in the medium-service companies. In the second round, Saudi Electricity Company won the large-

service company category and Yanbu Petrochemicals Company (Yenpt) for the large-manufacturing company category. No company was awarded either the medium service company category or the medium manufacturing company in this round.

King Abdulaziz Quality Award shares many similarities in its criteria with that of many other awards. It also has tailored the criteria to some of the country's needs. For example, one of the major economic issues that Saudi Arabia has is the large amount of non-Saudis in the workforce compared to high rate of unemployment for Saudis. The award custodians added section 3.6 Localization (also called "Saudization") to motivate organizations to hire Saudi citizens.

3.6.2 Saudi Arabia Status in the Global Competitiveness Index (GCI) Report:

In this section, two examples of recommendations on which changes should be made to the next revision of the award according to the country's results on the GCI report are provided. In reality, every index and sub-index should be explored and changes should be made accordingly. In this paper, two examples to follow, one horizontal modification and one vertical modification, are given. These two examples will be on KAQA award in Saudi Arabia.

The overall ranking of Saudi Arabia is advanced, mostly within the top 20 in the past five years. Figure 5 shows the overall ranking of Saudi Arabia on the GCI report since 2008.

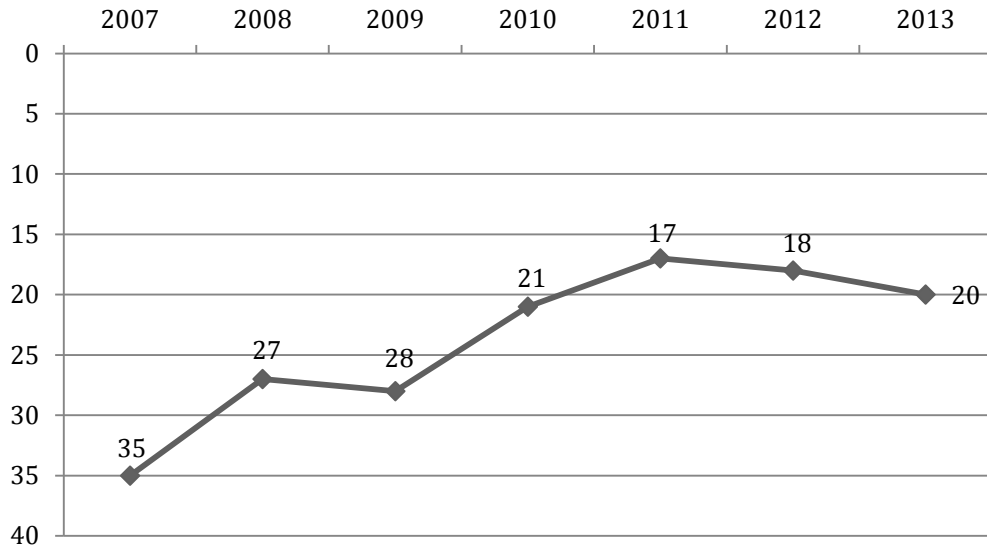


Figure 5. Saudi Arabia GCI overall ranking.

3.6.3 Example of Horizontal Modifications:

Saudi Arabia's rankings are acceptable on this pillar except for the Health and Primary Education index, where Saudi Arabia is ranked 50th. Figure 6 shows the rankings of Saudi Arabia on the main categories of the CGI. We see that Saudi Arabia's lowest rankings are in the health and primary education index. The sub-indexes within the health and primary education index are then investigated. The elements of which this index is composed are: malaria cases per 100,000 population, tuberculosis cases per 100,000, business impact of HIV/AIDS, infant mortality deaths per 1,000 population, education primary enrollment, life expectancy in years, and quality of primary education. Refer to Appendix B for Saudi Arabia's rankings in all elements of the Global Competitiveness Index.

From the quality award custodians' points of view, focusing on these elements in the coming revision of the award criteria can increase the nations' competitiveness. In this example, establishing an award for health care institutions and educational institutions with new criteria for each industry will improve the nation's competitiveness in these indexes. This is not a new

concept; Baldrige Performance Excellence award has established two awards for health care and educational institutions in 1998 (http://patapasco.nist.gov/Award_Recipients/index.cfm).

However, what is recommended here is guided by the nation's global competitiveness results. For that reason, when these two awards are established, competitiveness factors should be considered. For example, when an award is established for health care institutions, a specific clause in the award criteria should state how the applying institutions are treating malaria cases or tuberculosis cases and what preventive measures are made to reduce the impact of these diseases.

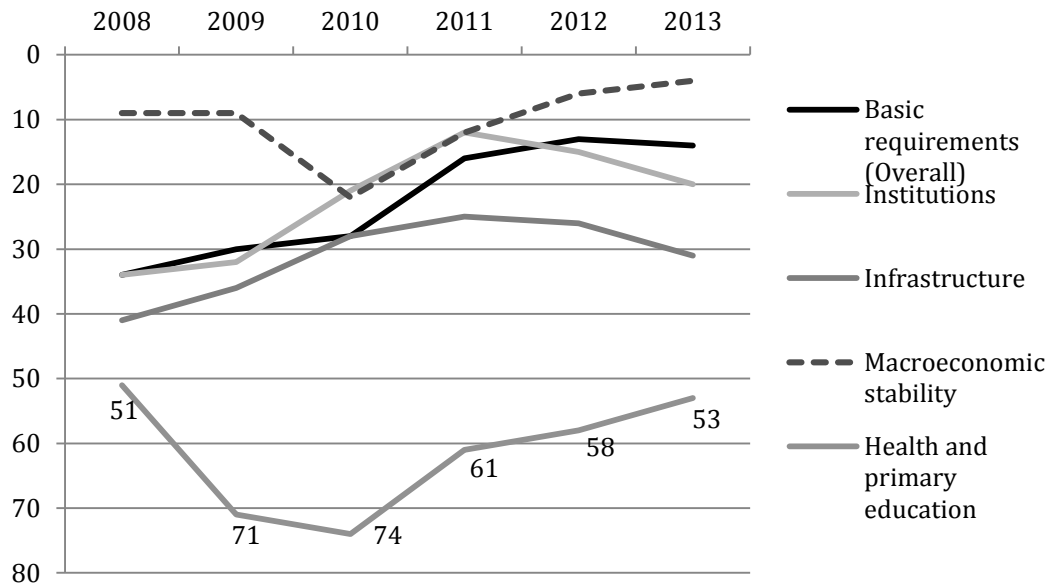


Figure 6. Saudi Arabia rankings on main pillars of the GCI.

Recommendation 1: Establish a specific award for health care and educational organizations.

3.6.3 Example of Vertical Modifications:

The lowest rank that Saudi Arabia has in the global competitiveness report is section 7.10 “Women in labor force, ratio to men”; Saudi Arabia is ranked 138th among

other nations. It is also ranked as 50th in section 7.08 “Reliance on professional management”. These two sections are met on KAQA requirements in section 3.1 “Human resource planning and selection”, weighted at 20 points out of 1,000 points of the award, and section 3.6 “Localization”, weighted at 15 points out of the 1000. These are areas of improvement for Saudi Arabia’s competitiveness and should be assigned greater weights. In short, the following is recommended:

Recommendation 2: increase the weights of section 3.1 “Human resource planning and selection” and section 3.6 “Localization” in the next revision of the award.

3.7 Discussion

The concept of quality awards has moved from focusing on quality to focusing on general management (Lee, Zuckweiler, Trimi, 2006). Historically, the concept of quality moved from product quality, to process quality, and finally to organizational excellence; this paper expands the scope to include the country’s competitiveness.

Two research papers motivated this work. First, Lee, Zuckweiler, and Trimi discussed the revisions over the Malcolm Baldrige Quality Award since its establishment (Lee, Zuckweiler, and Trimi, 2006). That article led the author to ask the question: Is there a systematic way of making quality award revisions? Second, Cetindamar and Kilitcioglu established a competitiveness award for organizations to aim for better competitiveness for their country. The similarities of the model for competitiveness of firms presented by Cetindamar and Kilitcioglu and quality awards criteria motivated the author to suggest making changes to quality awards rather than to establishing new awards for competitiveness. Cetindamar and Kilitcioglu proposed--and provided criteria for-- competitiveness awards (Cetindamar & Kilitcioglu, 2013). Moreover, the literature shows a trend in using one universal quality award, and several models have been suggested (Yang, 2009), (Talwar, 2008), (Sharma & Talwar, 2007). The expectation of one universal award is supported by the fact of the establishment of the Global Excellence Model Council (GEM). The Council

members are the custodians of major awards: EFQM (Europe), Baldrige Performance Excellence Award (USA), Japanese Quality Award (Japan), SAI Global (Australia), South African Excellence Foundation (South Africa), CII (India), Fundibeg (Brazil), Redibex (Mexico) and Singapore Quality Award (Singapore) (www.globalexcellence.org/home, accessed 2014).

A better approach is to expand quality award criteria to include competitiveness elements. This would lead to improvement for the following reasons: (1) Organizations have the motive to apply for quality awards to achieve competitiveness on an organizational level. It is the responsibility of the award custodians to merge organizational competitiveness requirements and national competitiveness requirements in the quality award criteria. (2) Quality awards already exist in many countries and have the desired level of awareness, although more awareness is still needed in developing countries and for newly established awards. (3) The future path of quality is moving the concepts of Total Quality Management to Organizational Excellence (Talwar,2011). Organizational Excellence should also impact the country's competitiveness if controlled and guided. (4) Quality awards (or performance excellence awards) do not have a clear direction for future changes and revisions. (5) One question that researchers raise is the sustainability issue for winning companies. In this paper, sustaining the country's (not the organization's) competitiveness can be achieved and is the ultimate purpose for which awards were established.

Scholars agree that national competitiveness is a result of individual organizations' competitiveness. The purpose of this paper is to demonstrate, through quality awards, the links between firm competitiveness and national competitiveness. The PDCA framework presented will ensure that organizational excellence will also lead to sustained national competitiveness. However, changes in the award criteria should not overshadow the main motive that drives companies to apply for quality awards, i.e. achieving organizational excellence. Controlling the criteria of the quality award by making horizontal and/or vertical changes will help in achieving both goals, achieving organizational excellence and better global competitiveness.

3.9 Conclusion

A Plan-Do-Check-Act cycle is presented to guide which changes are to be implemented in award criteria. The Plan phase starts by planning to make the desired changes to the award criteria for organizations upon their application. The Do phase is where custodians of the awards evaluate firms and organizations according to the criteria. Referring to the nation's competitiveness results on the GCI is the Check phase. The Act phase involves award custodians making horizontal or vertical changes to the award. The cycle continues since the GCI is published annually. Award custodians can make a five-year cycle for changes on the award criteria. A categorization of changes is also proposed on quality award's criteria. These changes help award custodians to tailor a blend of both the country's and organizations' needs.

This study aims to provide: (i) A framework for linking companies' competitiveness to the national competitiveness using a quality award model. (ii) A different perspective on how to evaluate the effectiveness of quality awards by understanding the nation's competitiveness. (iii) guidelines on how to make changes to the award criteria weights according to the needs of the national economy.

This paper attempts to open a new area of research on how the revisions of quality/ performance excellence awards should be made in alignment with the interest of national competitiveness. It also expands the concept of organizational excellence leading to national competitiveness. Future studies should apply his method and provide results to validate the effectiveness of this approach over the long-term. Future studies can also examine the effect of some quality awards' impacts on global competitiveness. The PDCA framework presented in this paper expands the purpose of quality awards to include national competitiveness. It also provides a sustainable methodology on which changes to implement in the criteria of quality awards in order to enhance national competitiveness. It is better to consider quality awards as a tool to improve competitiveness rather than establish a new award for firms' competitiveness.

CHAPTER 4: MICRO-LEVEL VIEW: IMPROVING ORGANIZATIONAL LEVEL INTGRATING HPI AND SIX SIGMA

4.1 Introduction

Chapter 3 presented a macro-level framework that uses a quality award model as an improvement tool for a nation to have better competitiveness. The framework is based on a Plan-Do-Check-Act cycle that will ensure the continuity of improvement over time.

It also provides guidelines and recommendation to the custodians of quality awards on which adjustments are required for the definition of excellence in the version of the quality award criteria.

In this chapter, we dig further toward the micro level, i.e. organizational level, and introduce operational improvement tools that can help organizations to improve their competitiveness. Two tools are in focus, Six Sigma and Human Performance Improvement (HPI), also called Human Performance Technology (HPT). The beginning of this chapter provides brief background information about both HPI (Human Performance Improvement) and Six Sigma. It addresses their definitions, concepts, methodologies, and scope and illustrates their similarities and differences. The popularity of HPI will be compared to that of Six Sigma, and the applicability of both approaches in both small and large organizations will be discussed. The importance of psychology in both HPI and Six Sigma will be manifested. The influential factors for managing HPI and Six Sigma projects will be illustrated. The discussion concludes with what we have learned in carrying out our comparisons and our recommendations for integrating both approaches in working on performance improvement initiatives.

4.2 Overview of HPT/HPI

The literature supports many performance improvement approaches. Nevertheless, these approaches have different dimensions depending on origin and need. For example, Human Performance Technology (HPT) supports several models that focus on reducing or eliminating the gap that occurs between the current and targeted states. These states represent problems or opportunities and challenges. The study of HPT occurs in management, psychology, human resources, and in instructional technology sciences, among others. For this discussion, the terms HPT and HPI, that is, Human Performance Technology and Human Performance Improvement are used interchangeably.

There are several definitions for HPT. However, there are common themes between the different definitions provided by various pioneers in the field. Pershing (2006) cites many of the well-known definitions by providing the key terms used in each. We will mention here the key terms that were shared in more than one definition because they should communicate essential elements of the HPT definition. Accomplishment, achievement, behavior, process, change, systematic study, competence, cost effectiveness, actualization of opportunities, and problem solving are repeated pivotal terms in the popular definitions of HPT. According to Pershing (2006), HPT is defined as “the study and ethical practice of improving productivity in organizations by designing and developing effective interventions that are results-oriented, comprehensive, and systemic” (p.6).

According to Ferond (2006), a multidisciplinary foundation grounded in behavioral analysis, economics, and cultural anthropology contributes to the strength of HPT. Ferond (2006) discussed an economic theory adapted by HPT which states that workers’ productivity increases when they are being paid according to their performance. This is also related to scientific

management, where the amount of reward is connected to the quality of performance. It is obvious that these theories are represented in motivation and incentives concepts in HPT as they have their origin in the behavioral sciences.

According to ISPI (2013), HPT is governed by a set of principles and a unique approach that guides practitioners in its applications. The major principles are represented in the RSVP acronym where R = Results, S = System, V = Value, and P = Partnership. HPT focuses on outcomes to confirm the improvement of performance. It takes a systematic view and connects the part to the whole and vice versa. It adds value for clients in several ways, such as increasing their profitability and the quality of the goods and services produced. It establishes partnerships between the clients and the HPT practitioners.

4.3 Overview of Six Sigma

According to Pyzdek & Keller (2010), “Six Sigma is the application of the scientific method to the design and operation of management systems and business processes which enable employees to deliver the greatest value to customers and owners” (p. 5). Six Sigma is not entirely a new approach; in fact, most of the tools used in Six Sigma were in use even before the term itself was established. Most of those tools were used under the umbrella of quality and continuous improvement. Since the beginning of the last century, several initiatives in quality were introduced and developed, such as Deming’s 14 points (Deming, 2000), Juran’s quality control process (Juran, 2000), Crosby’s quality is a free concept (Crosby, 1996), and more recently, ISO9000 quality management systems and total quality management. However, Six Sigma, which was introduced by Motorola in late 1980’s, has a wider spread and was adopted by many large companies which proudly announce that, for them, the process led to savings and performance improvements.

Black and Revere (2006) define Six Sigma as:

“A quality movement, a methodology, and a measurement. As a quality movement, Six Sigma is a major player in both manufacturing and service industries throughout the world. As a methodology, it is used to evaluate the capability of a process to perform defect-free, where a defect is defined as anything that results in customer dissatisfaction” (Black and Revere, 2006).

Six Sigma principles require that acceptable product or service variations fall within six standard variations from the average. So Six Sigma measures changing statistical probabilities in a very precise and detailed manner.

According to Roth (2013), Six Sigma is the latest version of improving product quality techniques. It adopted methods from Adam Smith, Frederick Taylor, W. Edwards Deming, the Systems school, and, more recently, Michael Hammer. These methods contributed to the strength of Six Sigma. They all focus on quantifiable improvement. However, Six Sigma is probably distinguished by some of its new tools and workers’ roles in the improvement process, which is explained later.

4.4 Methodology and Scope of HPT/HPI

The scope of HPT appears in its name, which is clearly more focused on improving the human side instead of on performance--in contrast to material processes and products. The methodology of HPT, as depicted in its several models, was created by pioneers in the Instructional Technology field and has been adopted and applied by many practitioners to improve human performance. Although there is some diversity in these approaches, they have a common goal of improving the performance of individuals, groups, teams, and organizations, and, ultimately, society. The first step in the HPI methodology is identifying the gap or the need based on the collected data about the desired outcome and the current situation. When the gap is identified, the causes are revealed by collecting data from all relevant stakeholders. As the causes of the performance issue are identified, then appropriate interventions are designed, developed, and

implemented to meet the specified needs. When the solution is implemented, its efficiency has to be evaluated and its consequences determined.

Although, we think that models were created to help novice practitioners and other professionals in the field to understand the theory and practice of HPT, it would not be realistic if we claim that a performance consultant needs only to follow any single model to provide successful recommendations. This is because some models are useful only for part of the process and cannot be effective in all of the performance improvement phases. For example, the Behavior Engineering Model (BEM) developed by Gilbert (1978) and the model developed by Mager & Pipe (1984) are more useful for cause analysis while we see Kaufman's Organizational Elements Model as an effective tool for gap analysis. In addition, successful practical experiences in real-life projects are more valuable than the theoretical knowledge of models, which are only tools that guide practice. Thus, the question here is how a practitioner makes use of the tools. When looking at HPT models, we realize that the improvement process is generally initiated from an issue. However, we believe that there is a trend for improving performance from an opportunity, not an issue. This is often due to the fact that clients, such as managers in organizations, do not like to be told that they have issues or problems. The other reason is because there are real opportunities in business which can benefit organizations that exploit them. This is derived in part from an appreciative inquiry approach which focuses on ongoing positive change rather than working only on solving performance issues (Whitney and Bloom, 2003 as cited in Van Tiem and Lewis, 2006).

4.5 Methodology and Scope of Six Sigma

Six Sigma is a performance improvement approach. The implementation of Six Sigma started in manufacturing companies. However, Six Sigma proved to be successful in many service industries (George, 2003). The outcomes of Six Sigma projects include improving product quality,

reducing cost, decreasing the number of defective parts, and reducing the variability of a process. An attribute of the Six Sigma approach that has popularized its use in many companies is its general structured methodology of the Define, Measure, Analyze, Improve, and Control (DMAIC) phases. This approach differs from the more traditional Plan-Do-Check-Act (PDCA) improvement cycle known in the quality field. The Define phase is where the problem, objective, team members, and timeline for the project are defined and written in a document called a Project Charter, which is the output of this phase. The Measure phase includes, but is not limited to, using Measurement System Analysis (MSA), process mapping, and identifying the process capability with a comprehensive understanding of the current state of the process being investigated. This is essential to making the Analyze phase more effective and powerful. Tools such as Cause and Effect Diagram, Failure Mode and Effect Analysis (FMEA), and Regression Analysis are typical tools that are used in this phase to find potential opportunities to make progress in the phases that follow. The Improvement phase is where potential solutions are studied and where that which is determined to be best is then implemented. The last phase, Control is where the solution is maintained to prevent any future problems from occurring.

The DMAIC is not the only approach for problem solving in Six Sigma. The DMAIC is used in projects aiming to improve processes that already exist. In cases of establishing new processes or designs, the Define, Measure, Analyze, Design, and Verify (DMADV) approach is used. Another unique characteristic of Six Sigma is the structured hierarchy of knowledge that is manifested using an approach similar to that used in the martial arts' order: yellow belt, green belt, black belt, and master black belt.

One of the factors that has made Six Sigma successful in manufacturing and other industries is the emphasis on numbers and statistics through the different project stages. This is

especially true during the measurement and analysis phases in the Six Sigma methodology. Most of the decisions made using Six Sigma are based on results derived from using statistical tools, such as hypothesis testing and Design of Experiment (DOE), which are grounded in data collection and analyses. It is essential for Six Sigma practitioners to develop a strong foundation in statistics, and this development is what the hierarchy of belts is based upon. So, the availability and use of data are critical factors upon which the Six Sigma methodology is dependent. It is clear that Six Sigma is a quantitative improvement method that relies heavily on measurement systems and their accuracy and applicability in improving processes.

An important distinction between HPT and Six Sigma is that HPT practitioners tend to use and analyze more qualitative data while Six Sigma practitioners focus on more quantitative data. HPT is sometimes criticized for a lack of scientific and rigorous analyses grounded in data. The appeal in HPT is that it delivers a more balanced approach (Roth, 2013). These differences in HPT and Six Sigma can be traced back to the origins of both approaches. HPT originated from the behavioral and social science fields and stems from the practice of instructional technologists and psychologists while Six Sigma was created and developed by engineers. It can be argued that both HPT and Six Sigma can improve their approaches by using mixed methods in data analysis. The DMAIC and DMADV processes in Six Sigma are similar to the processes of Performance Analysis, Cause Analysis, Intervention, Design, and Evaluation used in HPT. Both choices of improvement or new design are practiced in HPT, according to the situation. Motivation and incentives for employees are treated as important success factors for projects in both HPT and Six Sigma. The simulation and monitoring processes in Six Sigma in the verify phase are similar to formative and summative evaluation in HPT. Van Tiem, Dessinger, and Moseley (2006) show how performance improvement practitioners can benefit from adopting and adapting the principles

of Six Sigma to HPI; they also provide a very useful Six Sigma toolbox for the human performance practitioner. Table 6 summarizes definition, scope, basic concepts, and improvement approaches for HPT and Six Sigma.

Table 6. HPT and Six Sigma Definition, Scope, Basic Concept(s), and Improvement Approaches

Category	HPI	Six Sigma
Definition	“... the study and ethical practice of improving productivity in organizations by designing and developing effective interventions that are results-oriented, comprehensive, and systemic”(Pershing, 2006, p.6).	“A business improvement strategy used to improve business profitability, to drive out waste, to reduce quality costs and improve the effectiveness and efficiency of all operations or processes that meet or even exceed customers’ needs and expectations” (Antony and Banuelas, 2001, p.119)
Scope	Decisions are experiences and human oriented.	Decisions are numbers and statistically oriented.
Basic Concept(s)	Performance Analysis, Cause Analysis, Selection, Design and Development of Intervention and Evaluation	Define, Measure, Improve, Analyze, Control
Improvement Approaches	Gap Analysis approaches (e.g. Kaufman OEM model). Cause Analysis approaches (e.g. Gilbert BEM model) Comprehensive approaches (e.g. ISPI model)	DMAIC (Define, Measure, Analyze, Improve, and Control) is for improving existing processes. DMADV: Define, Measure, Analyze, Design and Verify

Note. BEM stands for Behavior Engineering Model and OEM stands for Organizational Elements Model

4.6 Popularity of HPT and Six Sigma

There are several HPT models that have been developed by many pioneers in the field. There are different views regarding the spread and popularity of HPT models. One view suggests that the development of the numerous HPT models has contributed to creativity and flexibility in

HPT practice and theory. On the other hand, because of these different models, practitioners do not have a consistent approach to follow in their consultation practices. This limits perceived consistency in practice among consultants and dilutes the successes of projects as attributable to a known HPT process negatively impacting its popularity and spread of use in corporate organizations.

According to Pearlstein (2012), most executives have not heard of HPT or HPI, but they know Lean Six Sigma. This observation is based upon his 40 years of experience as a consultant for many large profit and non-profit organizations as well as federal agencies. The Google search which he conducted to support his claim showed that Lean Six Sigma had 4,500,000 hits, HPI had 178,000 hits, and HPT had 174,000 hits, making Lean Six Sigma's being accessed 25 times more than either of the other two terms. Since Pearlstein's search was conducted on September 29, 2011, we did another search on November 25, 2012 to find out whether the gap between these terms is still the same or not. We found that "Lean Six Sigma" had 6,190,000 Google hits while "Human Performance Technology" had 87,400 and "Human Performance Improvement" had 86,100 (see Figure 8). On January 19, 2014, we executed another research. There were 2,260,000 Google hits for "Lean Six Sigma" and 58,400 for "Human Performance Technology" and 71,200 for "Human Performance Improvement". All the three terms were searched between two quotation marks to ensure the compatibility of the search to the specific approaches. The results are consistent with Pearlstein's earlier findings, but the gap was considerably reduced in our 2014 search period. Lean Six Sigma dropped to almost four million hits. We are not sure if this indicates something related to its current popularity, the nature of web pages which are not permanent, or different reasons. It is worth mentioning that the uniqueness of the term and its definition might have an influence on the popularity of the results. The term "Lean Six Sigma" is universal to all practitioners in the field

and industry. This is not the case in the Human Performance Improvement. For example, during our Google search, it showed that the abbreviation HPI also stands for Hardware Platform Interface and Human Poverty Index. HPT also stands for High Payoff Target and Hospitality Properties Trust index.

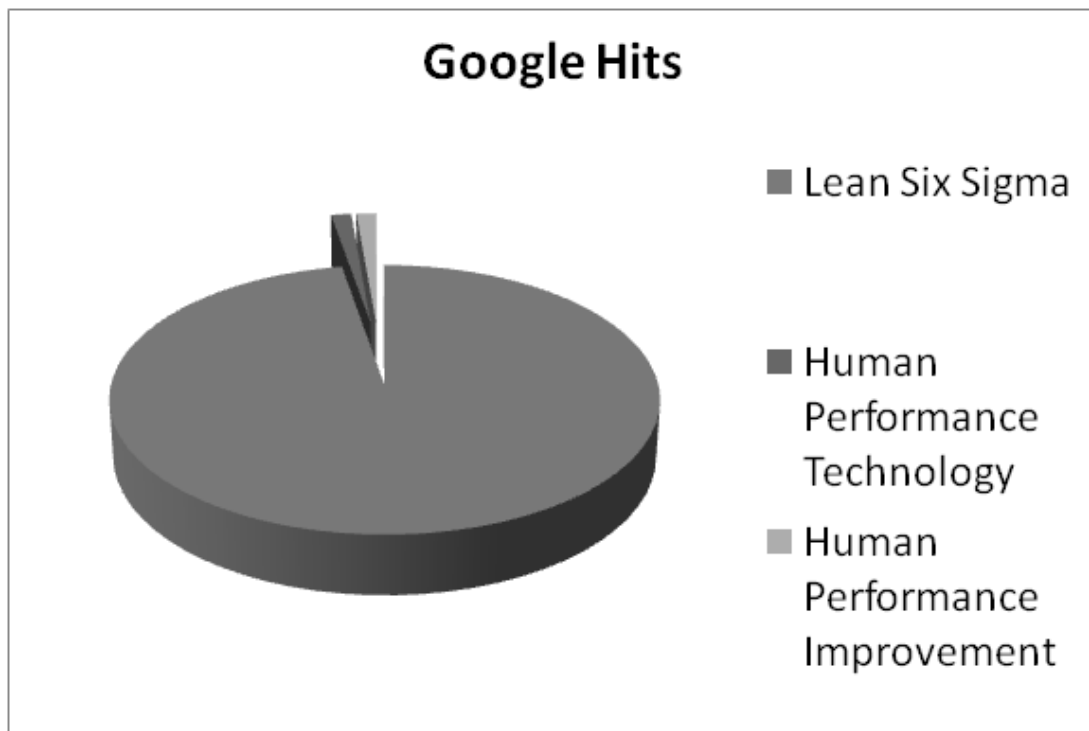


Figure 8. Google hits on Lean Six Sigma, HPT, and HPI as of Nov. 2012

The question which needs to be answered here is why most CEOs have not heard about HPT, whereas they have heard about Six Sigma. In the following section, we attempt to investigate the reasons behind the popularity of Six Sigma as compared to HPT.

Of the Fortune 200 companies, at least 25% claimed they have Six Sigma programs (Hammer, 2002). One important factor for the spread of Six Sigma is the impact of the Malcolm Baldrige Award, which is the nation's highest presidential honor for performance excellence given by the National Institute of Standards and Technology (Newman, 2012). One of the early companies to win this prestigious award was Motorola, Inc. in 1988. As known in the Six Sigma

practitioners' community, Motorola was the first company to implement Six Sigma in 1987, a year before winning the award. In addition, General Electric's CEO, Jack Welch, publicly announced that the company would adopt the Six Sigma breakthrough as an essential factor for the success of the company and that knowledge about Six Sigma would be linked to the employees' promotions and future career opportunities within the company (Pande, Neuman, & Cavanagh, 2000). Many large companies have implemented Six Sigma ,and it has proved to be successful in cost savings and performance improvement.

The Malcolm Baldrige Award is a governmental prize under the supervision of the American National Standards Institute (ANSI), and the president of the United States sponsors the annual announcement ceremony. The fact that Motorola and General Electric won this quality Award because of Six Sigma Implementation, gave Six Sigma a highly visible and positive reputation in the business world. An interesting question to pose would be if a company implemented HPT and won the Malcolm Baldrige award, would HPT gain the same visibility as Six Sigma? Or, would there be a similar impact if the International Society for Performance Improvement (ISPI) gave an annual prize similar to Malcolm Badlrige Award for the best performance improvement project in organizations? Would such an initiative promote the HPT approach in profit and non-profit corporations as well as governmental agencies? For Six Sigma, the Motorola and General Electric successes and the promotion of Six Sigma was a major factor in the spread of Six Sigma in the business community. So, it is important for HPI practitioners to focus more on the success stories that result from implementing HPI. It is also essential to have top executives' support for and belief in HPI.

4.7 Applicability of the Two Approaches in both Small and Large Companies

Many large companies have adopted Six Sigma and improved performance by reducing defects, improving quality, and reducing cost. However, the recordings of the spread of Six Sigma in small and medium-sized companies are limited in the literature. One reason is the cost associated with implementing Six Sigma. It requires a high level of knowledge of statistical tools and methods. It depends on projects that are based on teams; this consequently requires training for many employees within the organization. On the other hand, HPT can be implemented by one person or a small team, making it more applicable in small companies.

4.8 Psychology of HPT and Six Sigma

Psychology plays an important role in both HPT and Six Sigma approaches. Motivation, reorganization, promotions, and incentives are essential factors for continuous improvement, devotedness, and loyalty of employees. An individual can be recognized based on individual effort. Maslow's hierarchy of needs is emphasized in the literature of both Six Sigma and HPT (Feron, 2006) which represents important psychological factors for successful project implementation. The Black Belt individuals who manage Six Sigma projects need to see how their efforts are recognized and their work is valued to reach the highest level of motivation according to Maslow (Harry & Schroeder, 2000).

Jack Welch, former CEO of GE and a firm believer in Six Sigma projects, used Six Sigma as a means for management and incorporated the knowledge of Six Sigma as an essential component in the employees' reward system by providing bonuses based on their achievements (Harry & Schroeder, 2000). Welch tied GE employees Six Sigma training level, that is their level of belt achievement, to their annual performance and promotion. For example, if a manager at GE earned a green belt training, this would be advantageous for promotion to a higher position (Welch

& Byrne, 2001). This approach created a Six Sigma culture that increased the continuous improvement awareness in the company (Kwak & Anbari, 2006).

Thomas Gilbert, who is often recognized as the father of HPT, comes from a psychology background and was influenced by the well-known psychologist, his instructor, B. F. Skinner. According to Day (1997), several of the performance improvement pathfinders were influenced by Skinner's ideas. Motivation and incentives are key elements in Gilbert's (1978) Behavior Engineering Model (BEM) which shows the psychological nature of the HPT methodology. These could be financial or non-monetary incentives. Promotion and recognition in the workplace are recognized examples of motivation. All of these factors play an important psychological role in the individuals' progress, which eventually improves the workplace environment and productivity.

4.9 Success in Managing HPT and Six Sigma Projects

Both approaches emphasize the importance of understanding the business perspective for managing successful projects. Six Sigma projects rely heavily upon teamwork to be successful. In many HPT projects, partnering with clients is a key element in managing projects. HPT projects can be managed by external consultants as well as by internal managers while Six Sigma projects are run by internal employees. HPT projects seek to improve performance at three levels: Mega, Macro, and Micro. HPT not only aims to improve the performance of the operation and organizational level, but also works on improvement that becomes useful to society. These three levels are attributed to Roger Kaufman's work. The highest level is Mega, which is the outcome element and focuses on the positive impact on the society, community, and external clients. Kaufman says "if we are not contributing to society, we are taking away from it" (Van Tiem, Moseley, & Dessinger, 2012, p. 16). The second level is the Macro, which describes the output

element and focuses on the impact upon the organization internally and externally. The third level is the Micro, which includes the product element and focuses on the impact on departments and individuals. Six Sigma is unique in terms of the roles, responsibilities, and team work that are built on the business process model of the organizational structure. There is a hierarchy in a Six Sigma project, and each individual has a specific level of knowledge and skills which should enable that individual to accomplish designated tasks. As note earlier, this hierarchy is similar to the martial arts belts: Master Black Belts, Black Belts, and Green Belts. Master Black Belts are the most knowledgeable and experienced and work as mentors to several projects. Black Belts lead Six Sigma projects and direct team members who are Green Belts from different departments. However, the team work is important for sustainability and continuous improvement of a Six Sigma project.

Six Sigma is a project-based process. Project dynamics and communications are important to the success of project output. Kwak and Anbari (2006) identified four key factors influencing successful Six Sigma projects: (1) management involvement and organizational commitment, (2) project selection, management and control skills, (3) encouraging and accepting cultural change, and (4) continuous education and training. In HPI, the commitment and involvement of key stakeholders and employees is also essential for the development success. Stakeholders should contribute to the development by committing some of their time and the organizational resources to the process. HPT and Six Sigma projects need to be selected, reviewed, and tracked carefully to measure their costs and benefits. When an organization adopts new approaches in the workplace, it usually struggles with resistance to change, often from senior employees. The organization should encourage cultural change by motivating workers and explaining the benefits of applying this new approach. In addition to those factors, Antony and Banuelas (2002) and Coronado and

Antony (2002) added other factors that influence Six Sigma success, such as: understanding Six Sigma methodology, tools, and techniques; linking Six Sigma to business strategy and customers; project selection, reviews, and tracking; organizational infrastructure; and linking Six Sigma to suppliers. Also, linking Six Sigma to human resources is a factor that contributes to Six Sigma projects' success (Wyper & Harrison, 2000). Table 7 compares psychology, popularity, managing projects, and applicability in companies between HPT and Six Sigma.

Table 7. Psychology, Popularity, Managing Projects, and Applicability in companies of HPT and Six Sigma

	HPI/HPT	Six Sigma
Psychology	Influenced greatly by psychological theories that deal with motivation, reorganization, promotions, and incentives	Motivation, reorganization, promotions, and incentives are also essential factors for continuous improvement
Popularity	More popular among independent performance improvement specialists	More popular among CEOs and on search engines
Managing Projects	Understanding business perspective is important; Partnering and collaboration improve Mega, Macro, and Micro levels; Management and organizational commitment motivates success	Understanding business perspective is important; Emphasis on teamwork improves operation and organizational levels; Management and organizational commitment motivate success
Applicability in companies	Can be easily adopted in both small and large companies	Widely adopted in large companies but limited in small ones

4.10 Discussion

The exploration of different approaches to performance improvement broadens the knowledge of professionals. The exposition and practice of more than one performance improvement method enhances the practitioner's skill set and results in more and better solutions for problems. Marketing is an important strategy to increase awareness of performance improvement processes, and this has been neglected in part by HPI professionals and successfully applied by the Six Sigma community. Considering the similarities and differences between Six Sigma and HPI, it would be beneficial for practitioners and companies to integrate both approaches as they seek to improve performance.

Both Six Sigma and HPI can be used on an organizational level to improve operational performance and increase a firm's competitiveness. These two approaches have the advantage of being broad and applicable to any organization in any industry. Six Sigma, being from an engineering background, focuses on solid breakthrough changes in order to have better performance. On the other hand, HPI is a broad improvement approach that focuses mainly on improving human performance. It is a subjective approach and depends on the experience and expertise of the evaluator to achieve the desired level of improvement.

4.11 Recommendations

Since both HPT and Six Sigma approaches have different strengths and limitations, we recommend integrating both methods. This should lead to more holistic performance improvement that focuses on both the human and nonhuman elements. We recommend making use of the tools in Six Sigma in the HPT approach and vice versa. Performance specialists with HPT expertise should seek and use alternative approaches for performance improvement derived from other fields and vice versa. Moreover, more integration between HPI approaches and other performance

improvement approaches would increase HPI awareness among other performance improvement communities. For example, a Six Sigma project can improve human performance by quantifying and translating subjective opinions to data through surveys and other tools., A similar example might be translating the level of pain that a patient feels during diagnosis, treatment, or recovery by asking him/her to rate the pain on a scale of 1 to 10. However, HPI is better in achieving these improvement(s) than Six Sigma through understanding the psychological and social needs of employees and customers.

CHAPTER 5: CONCLUSION, LIMITATIONS, AND FUTURE RESEARCH

This chapter summarizes results presented in this research. The developed framework and improvement tools presented in this study aim to improve competitiveness on both a country level and a firm level, respectively. Government officials and custodians of quality awards can use the framework and tools used in this research for several reasons. First, it utilizes quality award model(s) as a betterment tool for firms' to improve competitiveness according to national competitiveness based on the Global Competitiveness Index standard. Second, it will provide incentives to firm's management seeking excellence and quality to make the desired adjustments to the firm based on quality award(s) criteria. This study also suggests the use of Six Sigma and HPI to achieve improvement on an organizational level.

5.1 Problems identified in the research

This study attempts to solve the following problems:

- There are many research papers and contributions in the field of competitiveness discussed in the literature on an international level. However, little research has been done on how to improve a country's competitiveness. In the literature, few studies have discussed tools and/or approaches that could help these countries to achieve better competitiveness. Although there is agreement in the literature that national competitiveness is a result of the competitiveness of a nation's firms and organizations competitiveness, government officials have no systematic approach that links and motivates firms to better areas of improvement of the national competitiveness.
- Quality awards and business excellence models were established to help firms and organizations to achieve excellence and better quality. The criteria of national quality awards in a country defines excellence in that nation. However, by exploring major quality

awards, we find some similarities but also many differences among national quality awards, which indicates that the definition and perception of excellence and quality differs from one nation to another. However, there are similar elements between quality and excellence awards and national competitiveness. The question that this study attempts to answer is how quality awards can help improve national competitiveness.

- The criteria of quality awards model are not static. They change regularly and new versions are established every three to seven years. It is not clear on what basis quality awards new revisions are based. Most new versions of quality awards either adopt the criteria of famous and known quality awards, such as Malcolm Baldrige Performance Excellence award, European Foundation Quality Model award, and Deming prize or make adjustments to the criteria based on expertise or surveys. This study provides guidelines for the custodians of quality awards in the areas of both improvement of the nation and making adjustments and revisions on the award criteria to refine these areas of improvement. It also provides the desired alignment between firm's excellence and competitiveness on one hand, and nation's competitiveness on the other.
- Many performance tools can help companies to improve their organizational competitiveness. These tools range in their scope from being comprehensive to the overall performance of the organization, such as Balanced Score Card (BSC), or being specific to a certain department or task, such as Total Shareholders Return (TSR). In addition, few performance tools consider the productivity and the psychological factors of performance within an organization. This research suggests two known tools to be best suited to work in conjunction in order to improve a firm's competitiveness, which will also achieve

national competitiveness goals, those being Six Sigma and Human Performance Improvement (HPI) tools.

5.2 Summary of chapters

This research has five chapters, as follows:

- Chapter 1 begins with an introduction to the topic. A brief background about competitiveness and the difference between macro-level competitiveness, i.e. country level, and a micro-level competitiveness, i.e. firm level. The chapter also introduces the reader to the significance of the study and the need for this contribution. It lays out the research gap that this research is filling. The structure of the dissertation is presented at the end of this chapter.
- Literature review on competitiveness is discussed at the beginning of Chapter 2. It includes a historical background of firm's competitiveness. It also presents determinants of competitiveness and methods and strategies on how to achieve better performance. The chapter also shows some known tools that improve and help firms to achieve competitiveness. The other half of this chapter presents a review on quality awards. It discusses the goals of establishing quality awards, introduces famous quality awards, and provides a review on similarities and differences among quality awards throughout the world. It also explores the effectiveness of quality awards in the literature.
- Chapter 3 discusses competitiveness from a macro-level point of view. It first introduces and discusses the competitiveness measure used in this research, the Global Competitiveness Index report and offers background about the World Economic Forum as the publisher of this index. The chapter then explains the big picture and defines the three levels of competitiveness used in this research: country competitiveness level, national

competitiveness level, and organizational competitiveness level. It goes on to elaborate on the link between these three levels. The chapter also presents the Plan-Do-Check-Act framework that shows how adjustments on the quality award criteria can lead to better results in the competitiveness of the nation. Furthermore, the chapter investigates and explains the types of adjustments that can be made on the award's criteria and categorizes these adjustments. The chapter ends with a case study of the Saudi Arabian Quality Award, King Abdulaziz Quality Award, and proposed adjustments to the award criteria that will lead to better national performance results in Saudi Arabia's global competitiveness.

- Chapter 4 ventures deeper to suggest improvement tools that would lead to increasing the competitiveness of organizations on a micro-level. Given the fact that a country's competitiveness depends on the competitiveness of the organizations within this country, the study provides two improvement tools that increase organizational competitiveness in its human and non-human elements. Human Performance Improvement (HPI), also called Human Performance Technology (HPT), is an improvement method that emerged from the field of education and psychology aiming to improve performance. Six Sigma, on the other hand, is suggested in this research to improve operations and quantitative problems. Chapter 4 started by defining these two methods. The chapter also compares and contrasts the two methods in an attempt to differentiate them. The chapter ends with the conclusion that these two methods cover all aspects of the foundations of successful organization elements.
- Chapter 5 delivers the conclusion of this study. It summarizes the study chapter by chapter. It also presents the results and contributions of the study, its limitations, and implications for future research.

5.3 Results and contributions

This study aims to gain a better understanding of competitiveness on a macro and micro level, and to provide a methodology to improve a nation's competitiveness. The results and contributions of this research are as follows:

- The study has explored national competitiveness and the relationship between a country's competitiveness and the competitiveness of its organizations. The study classified competitiveness as: a macro-level competitiveness, which is an international-level competitiveness among countries; a national level, which is competitiveness of organizations among themselves within a country; and a micro-level competitiveness, which is the competitiveness of an organization within the organization itself.
- This research tested the use of national quality awards as tools to improve a country's competitiveness. The study tested the relationship between the elements of quality awards criteria on one hand, and the elements of competitiveness of a nation on the other hand. Competitiveness elements adopted in this research were the elements of the Global Competitiveness Index report issued by the World Economic Forum. This study found that there are many common elements between a nation's competitiveness and the elements of organizational excellence.
- This study is the first to use quality awards as a tool that governments can use to improve national competitiveness through adjusting the organizational definition of excellence. Adjusting the criteria of quality awards based on the country's competitiveness is proposed. To make these adjustments, the study explored changes that were made to quality awards and analyzed these changes. This analysis resulted in classifying adjustments on quality awards to vertical modifications and horizontal modifications. Vertical modifications are

changes that are made on an index or sub-index within existing criteria, such as adding more weight on an index, adding an index, or even removing one. Horizontal modifications are those changes on the award where it focuses on a new industry. One example is having new award criteria for educational institutes or non-profit organizations.

- This research also contributed to the literature by providing a framework for continuous and sustainable improvement through linking a country's competitiveness to the competitiveness of its organizations. A framework that improves competitiveness based on the Plan-Do-Check-Act cycle is proposed to monitor, control, and improve organizational competitiveness, through quality awards, according to the needs of the nation's competitiveness. The framework continuity is ensured through two dynamic references, the annual competitiveness index report and the new revisions of quality awards every three to five years.
- Furthermore, the research investigates the micro-level competitiveness, i.e. organizational level. Six Sigma is a known improvement tool in manufacturing and service industries used to improve performance. Human Performance Improvement (HPI) is an improvement method used in education and psychology that improves human performance with a comparison between the current state and desired state of improvement required. Using these two methods specifically will cover all aspects an organization will need in order to achieve improvement and have a competitive advantage over other companies.

5.4 Limitations

This study provides a theoretical framework for improving competitiveness through using improvement tools on both macro and micro levels. The scope is limited to improving

competitiveness according to the competitiveness elements presented by the World Economic Forum through the annual global competitiveness report. It is possible that there are other elements of competitiveness that are not covered in the Global Competitiveness Index report but are included in some other references to the definitions of competitiveness. This study is also bounded by improving competitiveness on a macro level using quality awards that already have known criteria and weights for elements within the criteria of the award.

This study is further limited by the difficulty of a long-term implementation of a real-life example for verification. To do so, custodians of a quality award should implement this model and make the desired modifications based on the framework suggested in this study. First, they should identify areas of improvement of the nation's competitiveness according the GCI report. Second, they must understand which elements are important to the national strategy. Third, they need to adjust the award criteria according to GCI results, making vertical modifications for the current criteria or making horizontal modifications by announcing a new award focusing on certain industry. Finally, a new version of the award is announced, and an analysis of results during five years would be required to verify the success of this cycle.

5.5 Future Research

This research opens the field by including additional value to quality awards. This added value not only helps companies to achieve excellence, but also helps to improve the national competitiveness level. It is possible to examine certain elements of a quality award with its equivalent element on the global competitiveness report. Another opportunity brought about by the research could be examining the similarities and differences of other competitiveness reports, such as World Competitiveness Yearbook published by Institutes of Management Development, and determining how a quality award model can improve a country's competitiveness through it.

APPENDIX A:

ELEMENTS OF THE GCI AND TYPES OF MODIFICATIONS THAT CAN BECHANGED ON QUALITY AWARD CRITERIA.

(V: VERTICAL MODIFICATIONS, H: HORIZONTAL MODIFICATIONS, N/A: NOT APPLICABLE.)

Elements of Competitiveness Index	Adjustments		
	V	H	N/A
<i>1st pillar: Institutions</i>			
1.01 Property rights	✓		
1.02 Intellectual property protection	✓		
1.03 Diversion of public funds			✓
1.04 Public trust of politicians			✓
1.05 Irregular payments and bribes			✓
1.06 Judicial independence			✓
1.07 Favoritism in decisions of government officials			✓
1.08 Wastefulness of government spending			✓
1.09 Burden of government regulation			✓
1.10 Efficacy of legal framework in settling disputes			✓
1.11 Efficiency of legal framework in challenging regs			✓
1.12 Transparency of government policymaking			✓
1.13 Gov't services for improved business performance	✓		
1.14 Business costs of terrorism			✓
1.15 Business costs of crime and violence			✓
1.16 Organized crime			✓
1.17 Reliability of police services		✓	
1.18 Ethical behavior of firms			
1.19 Strength of auditing and reporting standards	✓		
1.20 Efficacy of corporate boards			✓
1.21 Protection of minority shareholders' interests			✓
1.22 Strength of investor protection			✓
<i>2nd pillar: Infrastructure</i>			
2.01 Quality of overall infrastructure	✓		
2.02 Quality of roads		✓	
2.03 Quality of railroad infrastructure		✓	
2.04 Quality of port infrastructure		✓	
2.05 Quality of air transport infrastructure		✓	
2.06 Available seat kilometers			✓
2.07 Quality of electricity supply		✓	
2.08 Telephone lines		✓	
2.09 Mobile telephone subscriptions		✓	

3rd pillar: Macroeconomic stability

3.01	Government budget balance, % GDP*		✓
3.02	Gross national savings, % GDP*		✓
3.03	Inflation, annual % change		✓
3.04	Interest rate spread		✓
3.05	General government debt, % GDP*		✓
3.06	Country credit rating, 0-100 (best)		✓

4th pillar: Health and primary education

4.01	Business impact of malaria		✓
4.02	Malaria cases/ 100,000 pop.		✓
4.03	Business impact of tuberculosis		✓
4.04	Tuberculosis cases/100,000 pop.		✓
4.05	Business impact of HIV/AIDS		✓
4.06	HIV prevalence, % adult pop.		✓
4.07	Infant mortality, deaths/1,000 live births		✓
4.08	Life expectancy, years		✓
4.09	Quality of primary education		✓
4.10	Primary enrollment		✓
4.11	Education expenditure		✓

5th pillar: Higher education and training

5.01	Secondary education enrollment, gross %		✓
5.02	Tertiary education enrollment, gross %		✓
5.03	Quality of the educational system		✓
5.04	Quality of math and science education		✓
5.05	Quality of management schools		✓
5.06	Internet access in schools		✓
5.07	Availability of research and training services	✓	✓
5.08	Extent of staff training	✓	✓

6th pillar: Goods market efficiency

6.01	Intensity of local competition		✓
6.02	Extent of market dominance		✓
6.03	Effectiveness of anti-monopoly policy		✓
6.04	Extent and effect of taxation		✓
6.05	Total tax rate, % profits		✓
6.06	No. of procedures required to start a business		✓
6.07	No. days to start a business		✓
6.08	Agricultural policy costs		✓
6.09	Prevalence of trade barriers		✓
6.1	Trade tariffs, % duty		✓
6.11	Prevalence of foreign ownership		✓
6.12	Business impact of rules on FDI		✓

6.13	Burden of customs procedures		✓
6.14	Imports as a percentage of GDP		✓
6.15	Degree of customer orientation	✓	
6.16	Buyer sophistication		✓
	<i>7th pillar: Labor market efficiency</i>		
7.01	Cooperation in labor-employer relations	✓	
7.02	Flexibility of wage determination	✓	
7.03	Non-wage labor costs	✓	
7.04	Regidity of employment		✓
7.05	Hiring and firing practices	✓	
7.06	Firing costs		✓
7.07	Pay and productivity	✓	
7.08	Reliance on profesional management	✓	
7.09	Brain drain	✓	
7.10	Women in labor force, ratio to men	✓	
7.11	Redundancy costs, weeks of salary	✓	
	<i>8th pillar: Financial market sophistication</i>		
8.01	Availability of financial services		✓
8.02	Affordability of financial services		✓
8.03	Financing through local equity market		✓
8.04	Ease of access to loans		✓
8.05	Venture capital availability		✓
8.06	Restriction on capital flows		✓
8.07	Strength of investor protection		✓
8.08	Soundness of banks		✓
8.09	Regulation of securitites exchanges		✓
8.10	Legal rights index		✓
	<i>9th pillar: Technological readiness</i>		
9.01	Availability of latest technologies	✓	
9.02	Firm-level technology absorption	✓	
9.03	Laws relating to ICT		✓
9.04	FDI and tchnoogy transfer		✓
9.05	Mobile telephone subsribers		✓
9.06	Individuals using internet, %	✓	
9.07	Personal computers		✓
9.08	Mobile broadband subscriptions/ 100 pop.	✓	
9.1	Int'l Internet bandwidth, kb/s per user	✓	
	<i>10th pillar: Market size</i>		
10.01	Domestic market size		✓
10.02	Foreign market size		✓

11th pillar: Business sophistication

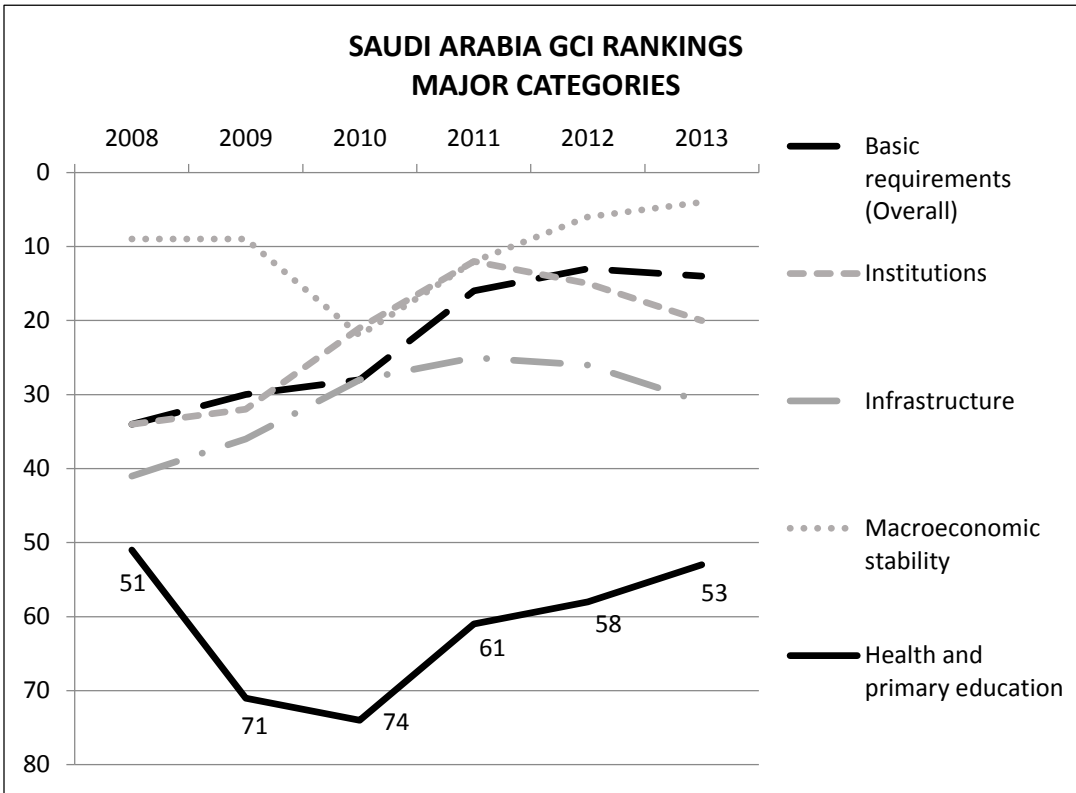
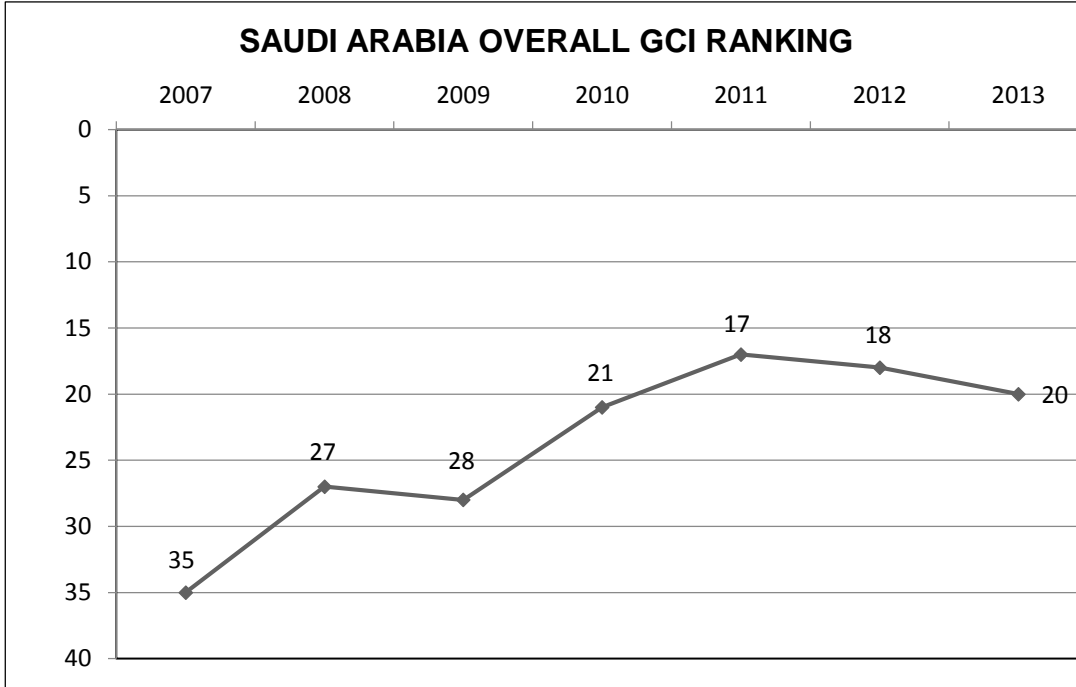
11.01	Local supplier quantity	✓	
11.02	Local supplier quality	✓	
11.03	State of cluster development		✓
11.04	Nature of competitive advantage		✓
11.05	Value chain breadth		✓
11.06	Control of international distribution		✓
11.07	Production process sophistication		✓
11.08	Extent of marketing	✓	
11.09	Willingness to delegate authority		✓

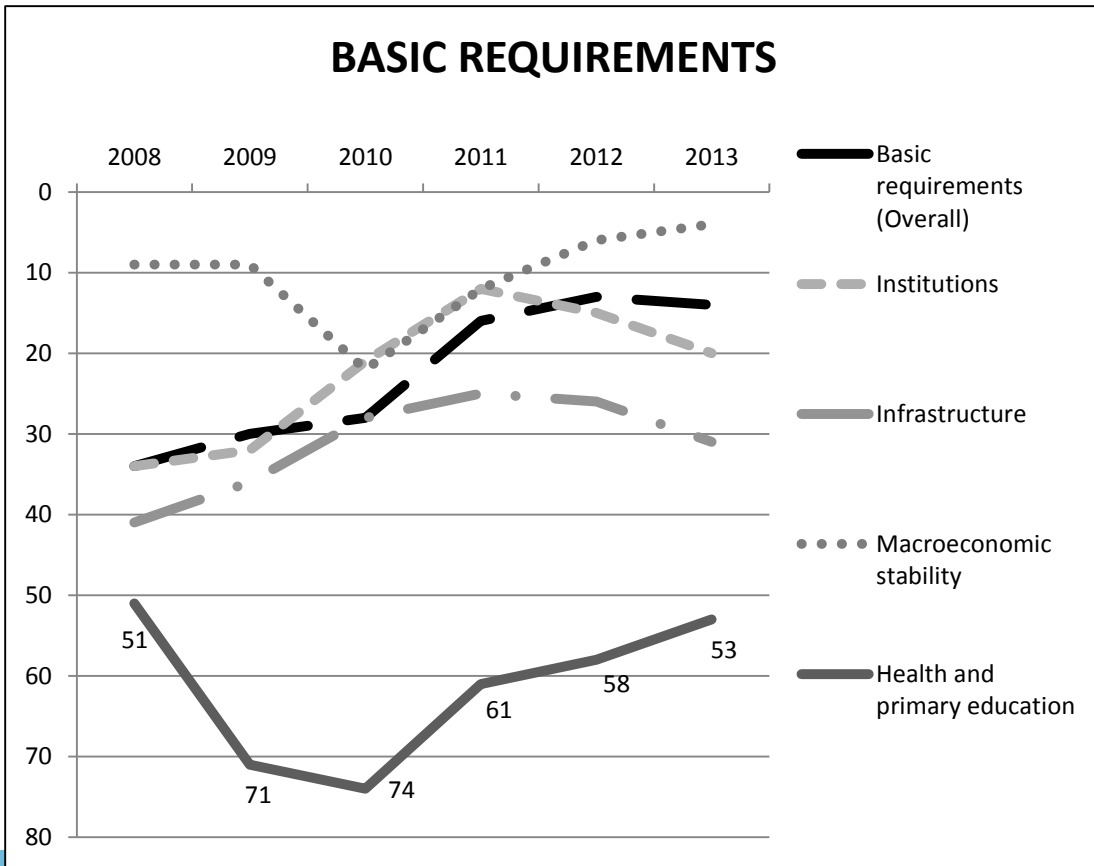
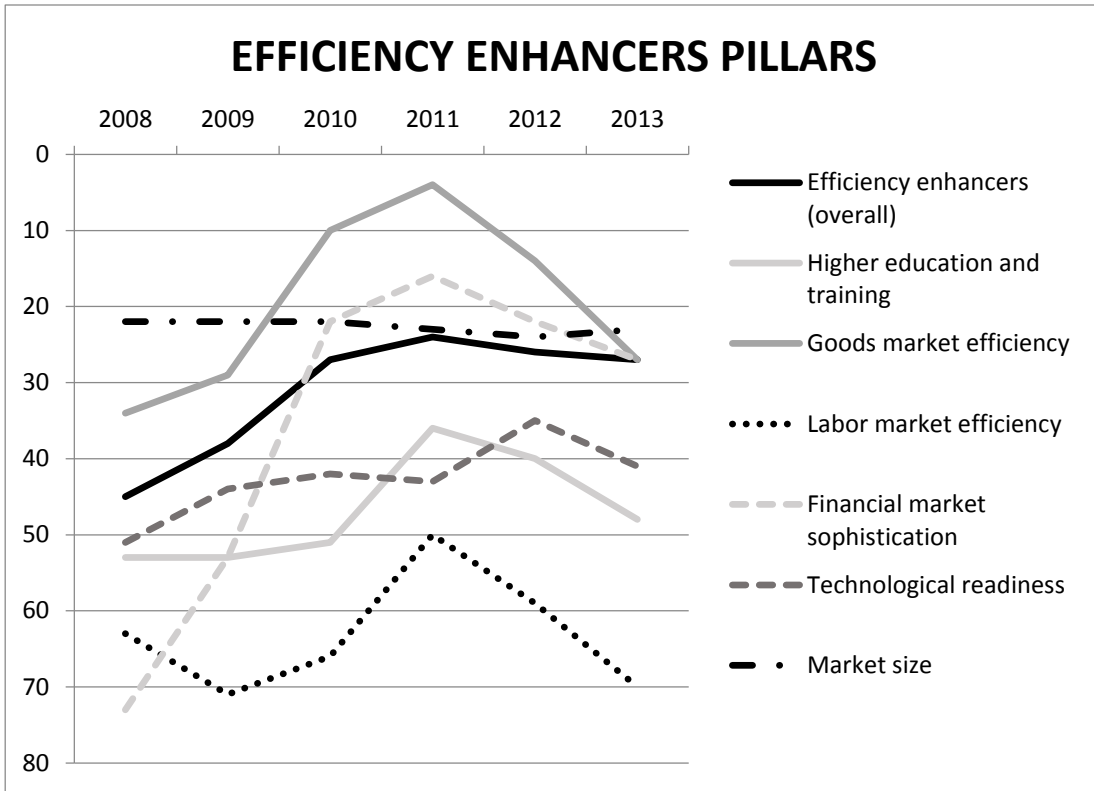
12th pillar: Innovation

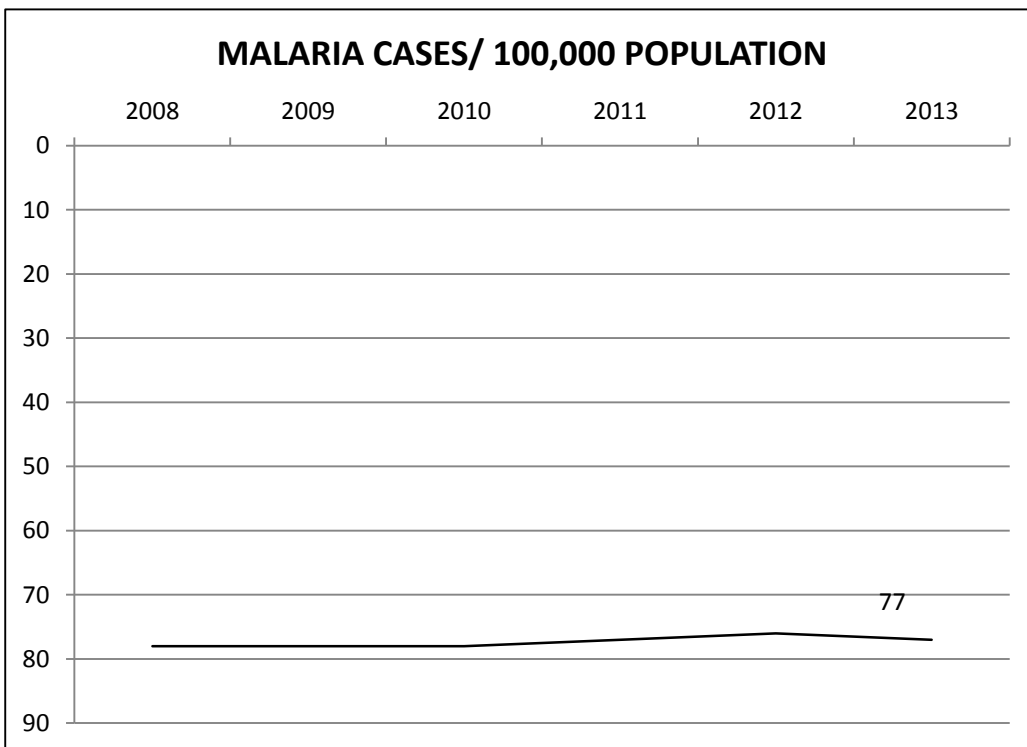
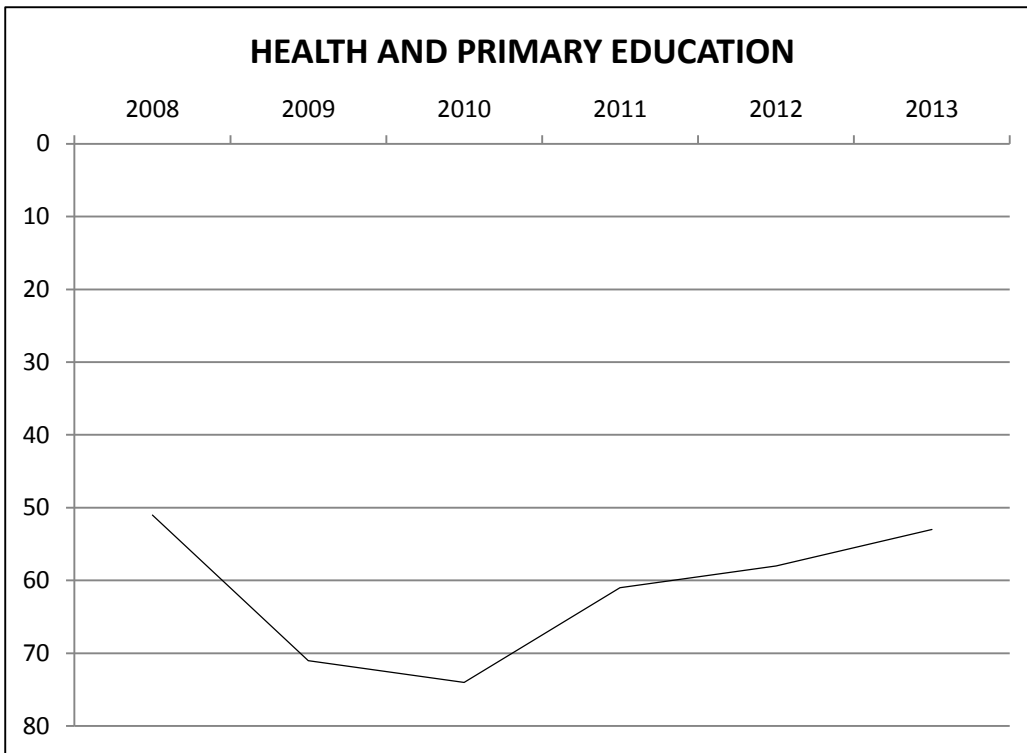
12.01	Capacity for innovation	✓	
12.02	Quality of scientific research institution	✓	
12.03	Company spending on R&D	✓	
12.04	Univeristy-industry collaboration in R&D		✓
12.05	Gov't procurement of advanced tech products	✓	
12.06	Availability of scientists and engineers		✓
12.07	PCT patents, applications/ million pop.		✓

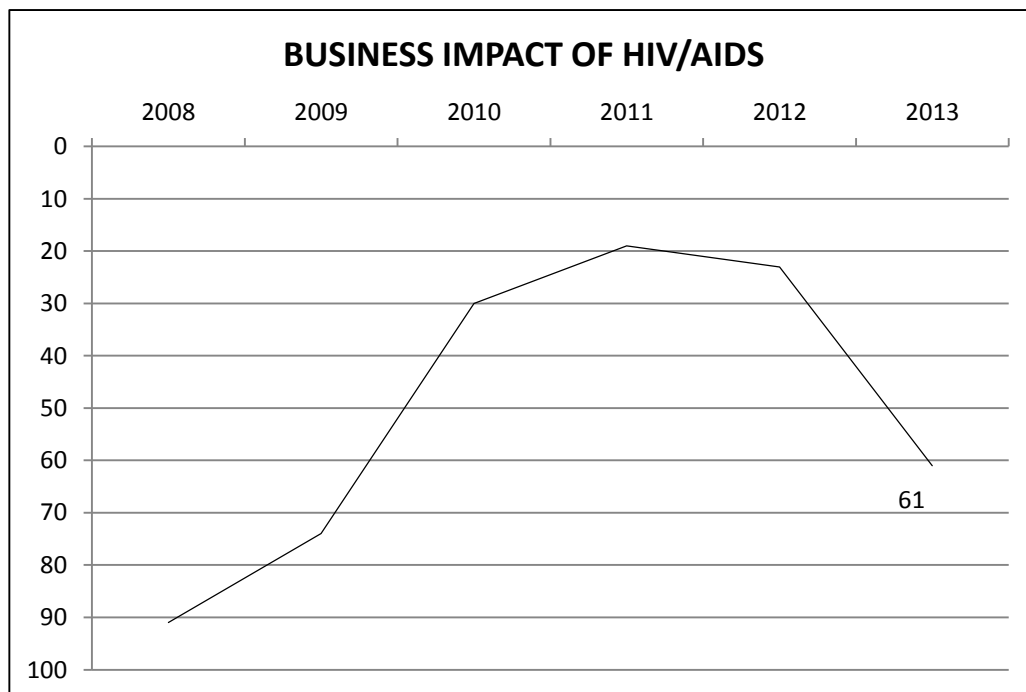
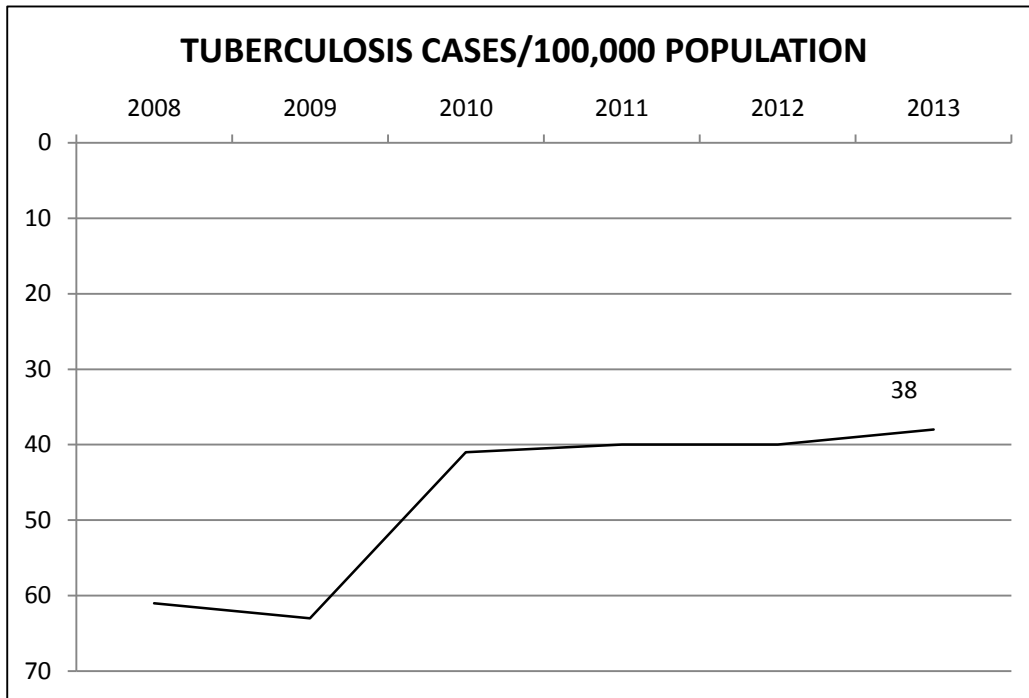
APPENDIX B

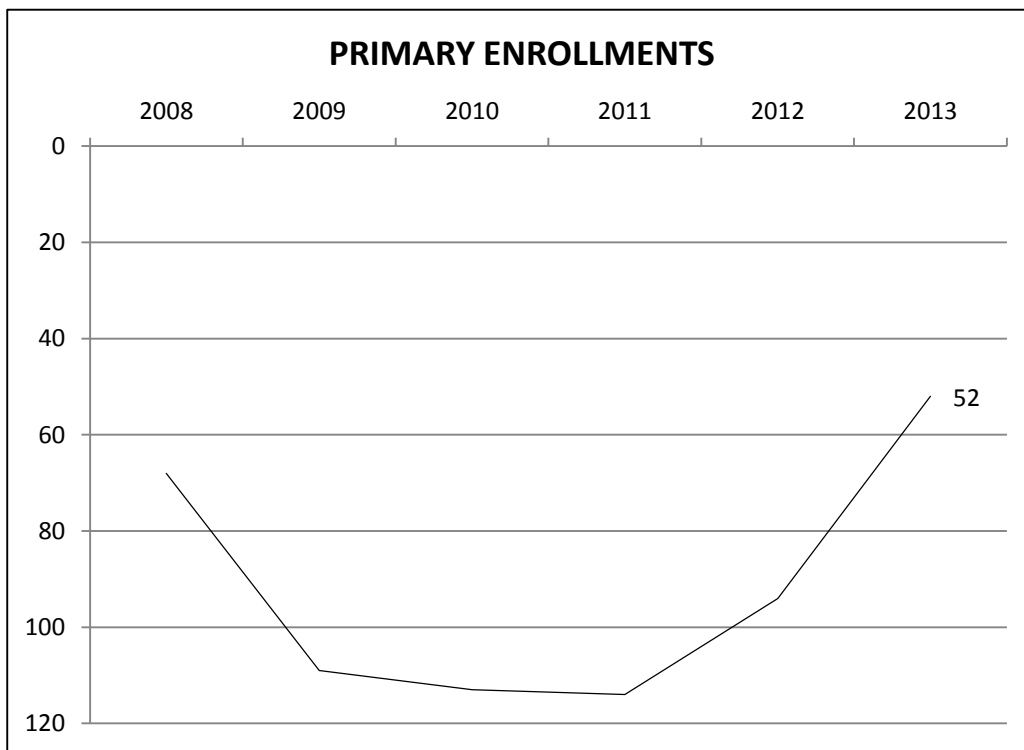
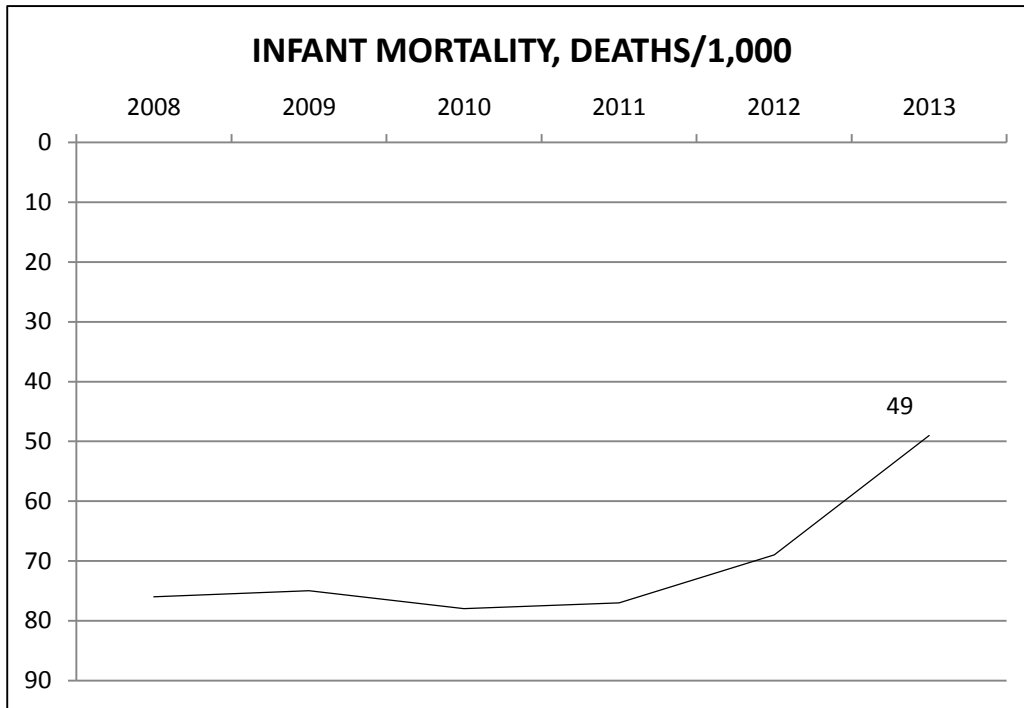
SAUDI ARABIA'S DETAILED RANKINGS GLOBAL COMPETITIVENESS INDEX REPORT 2008 - 2013

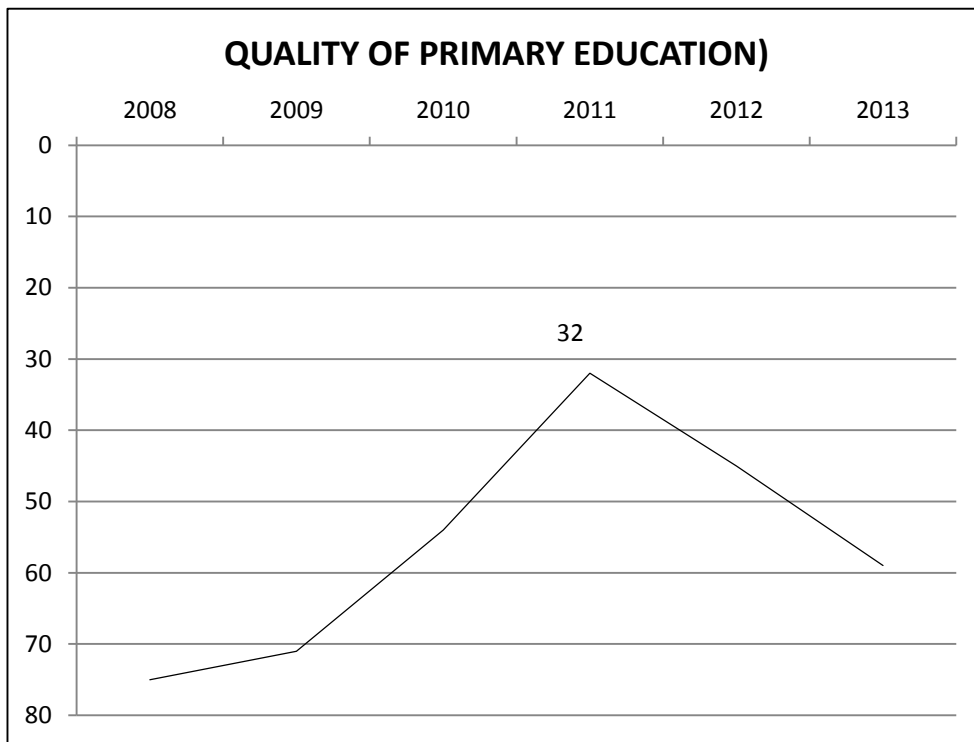
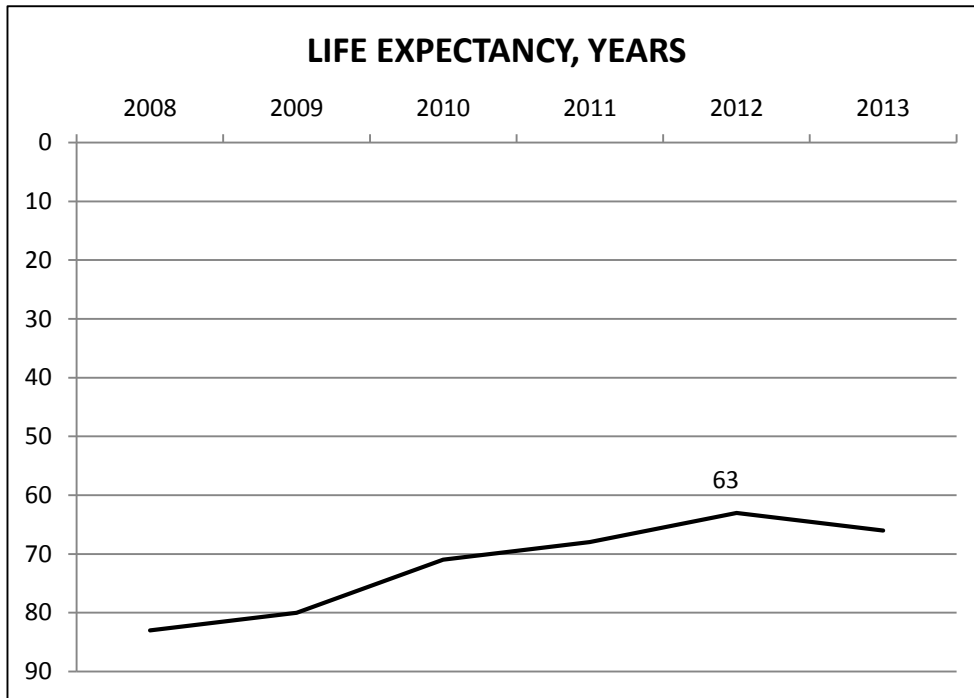


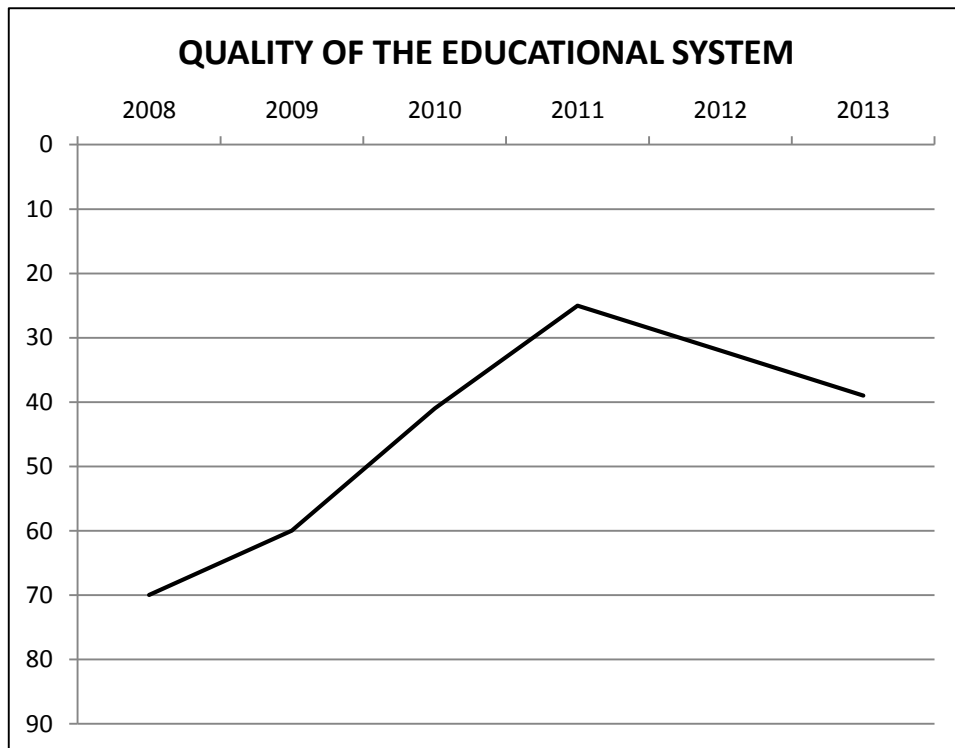
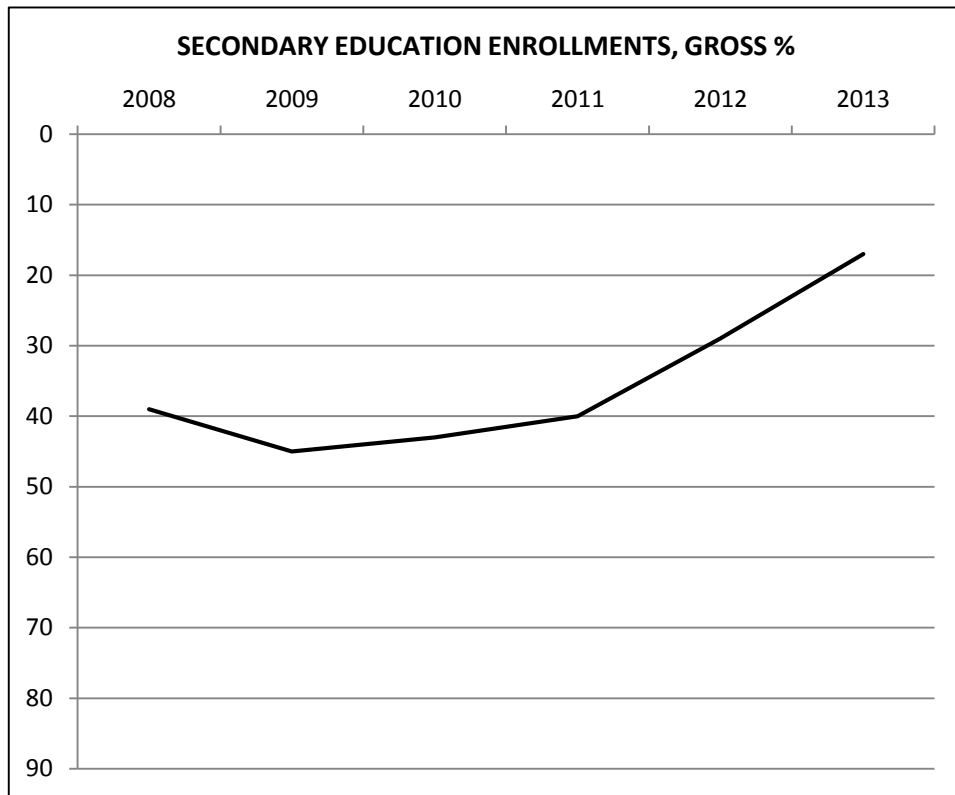


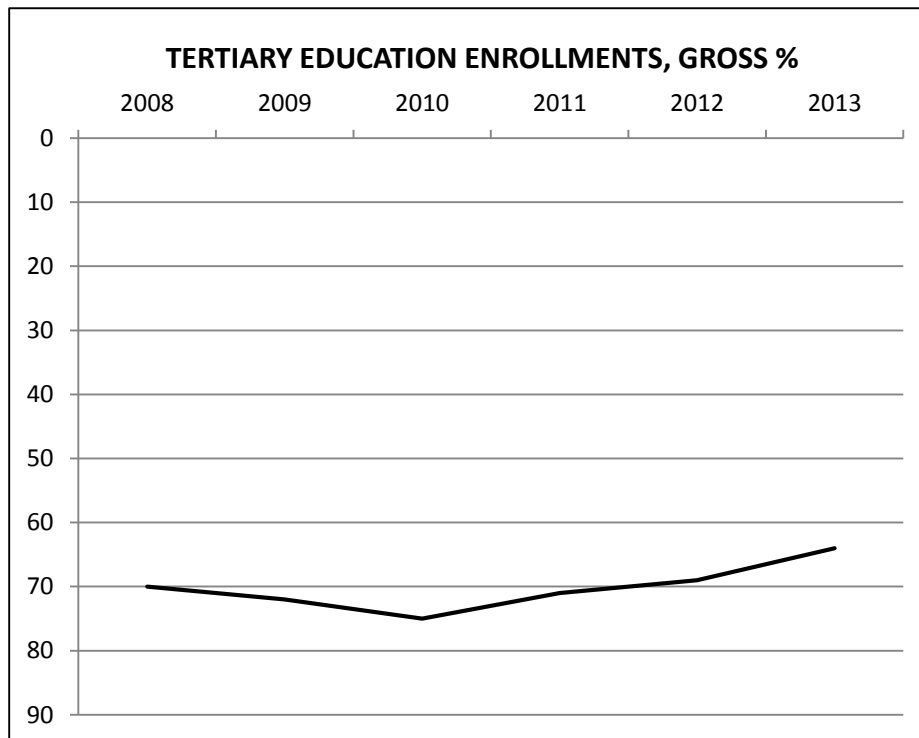
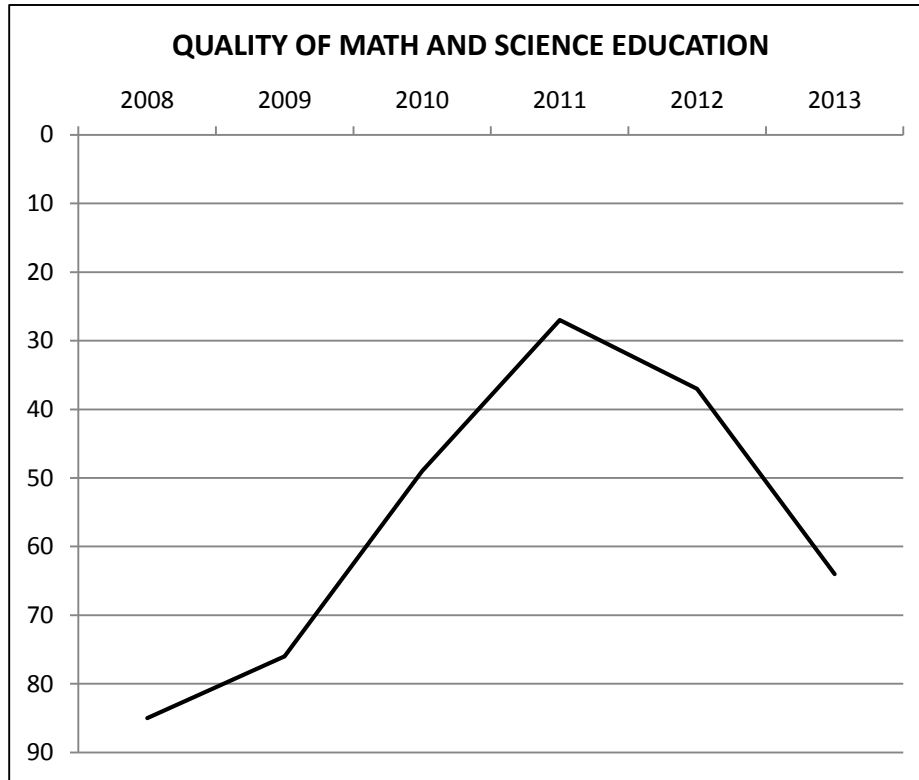


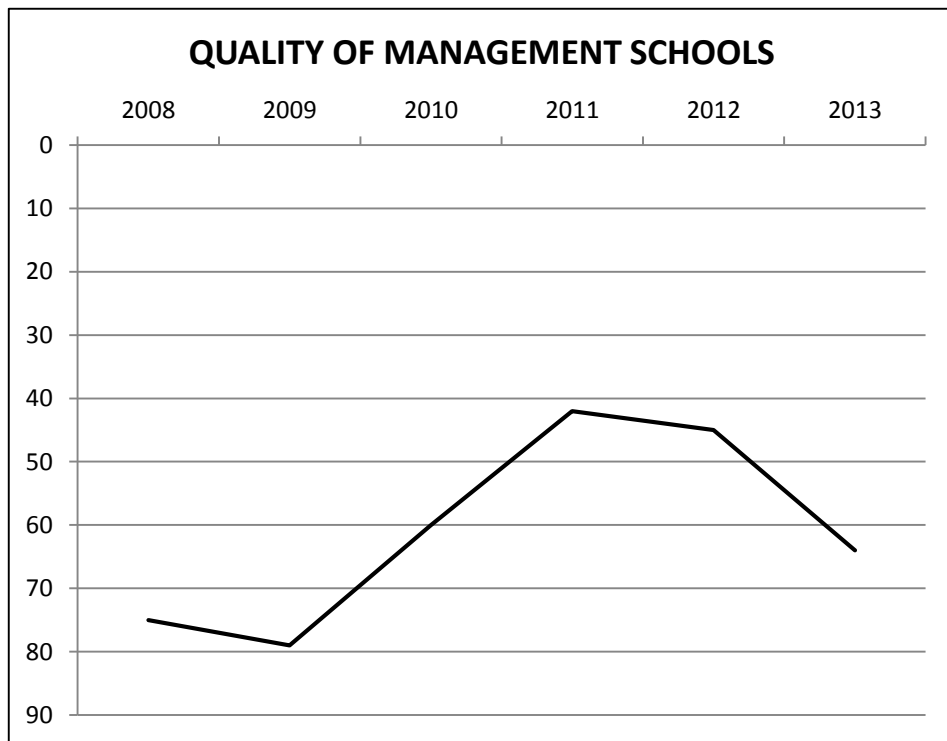
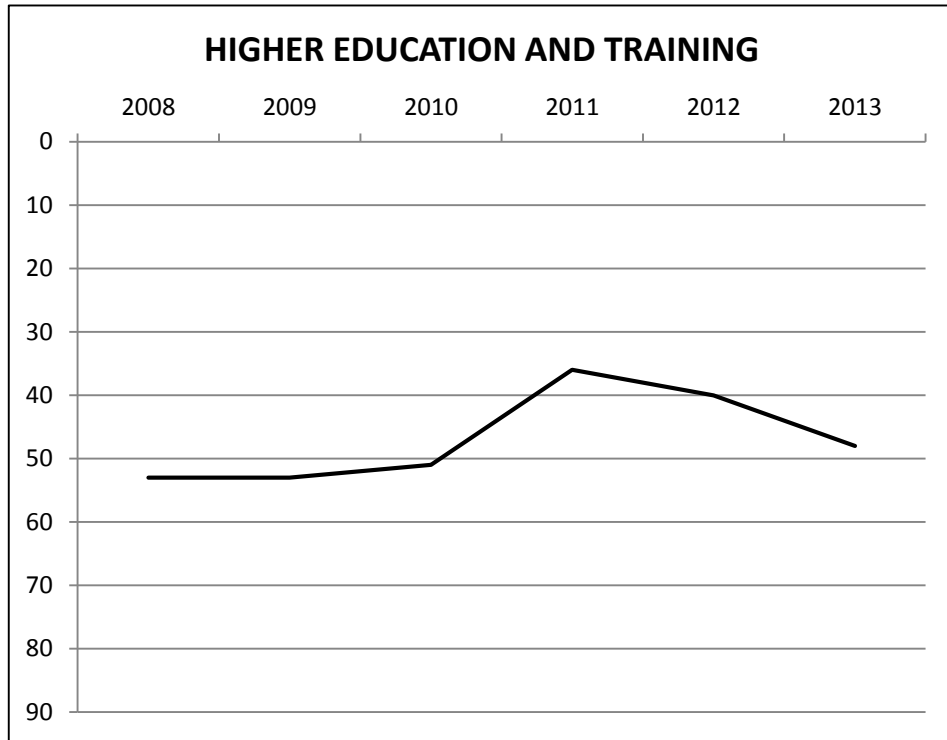


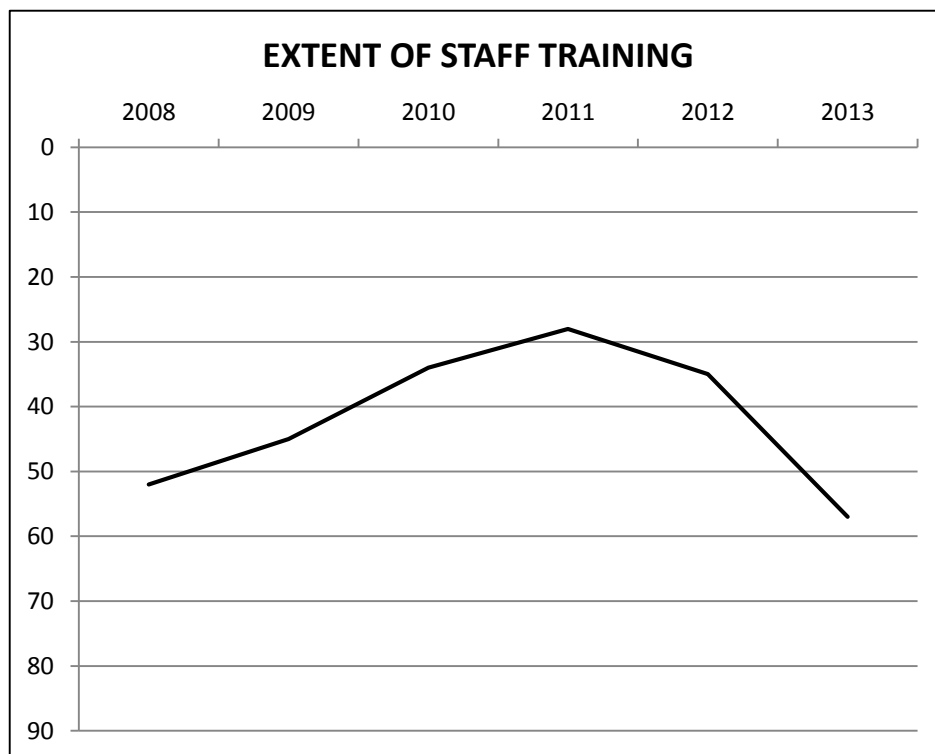
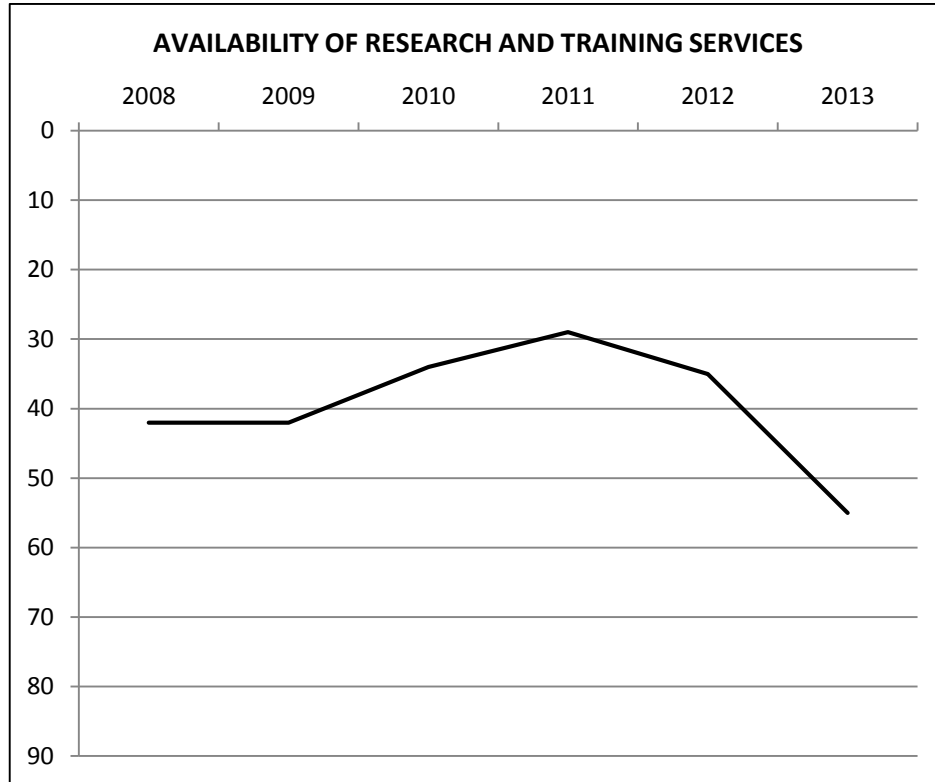


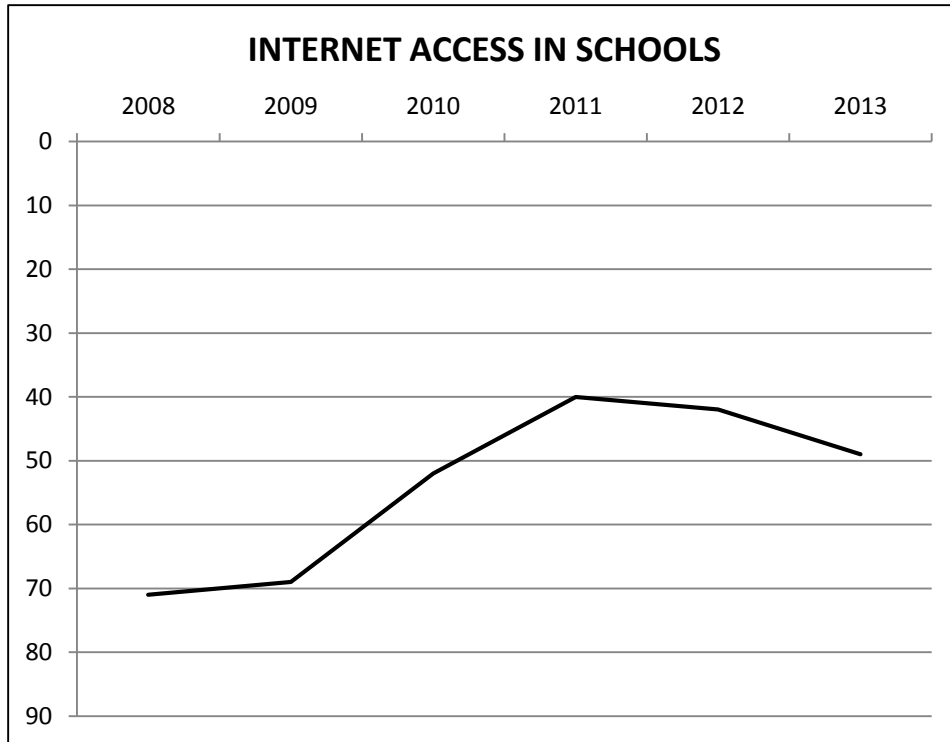


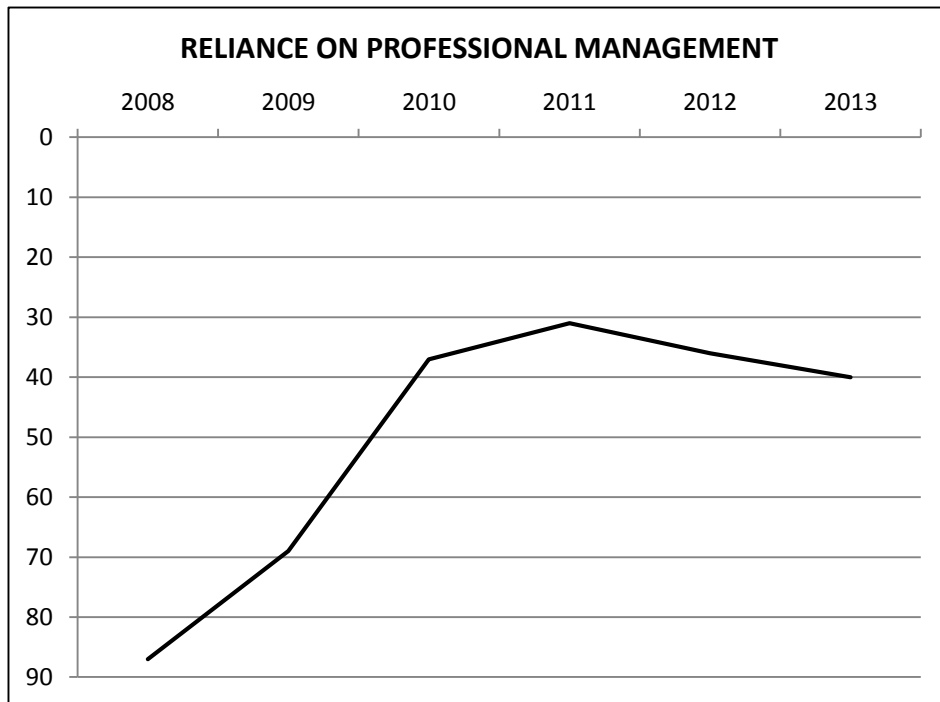
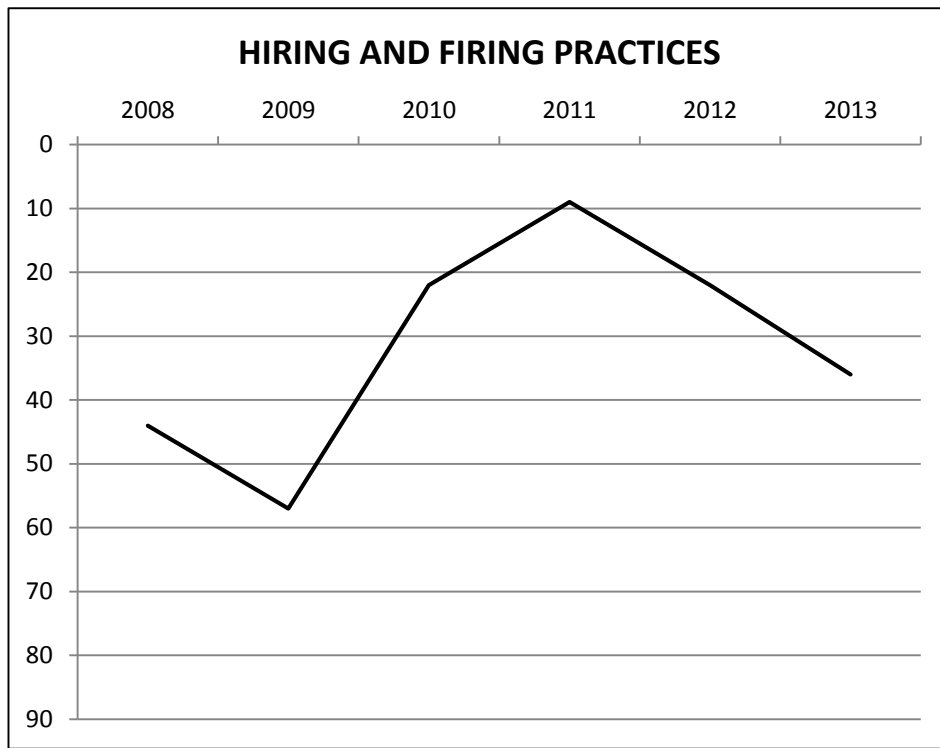


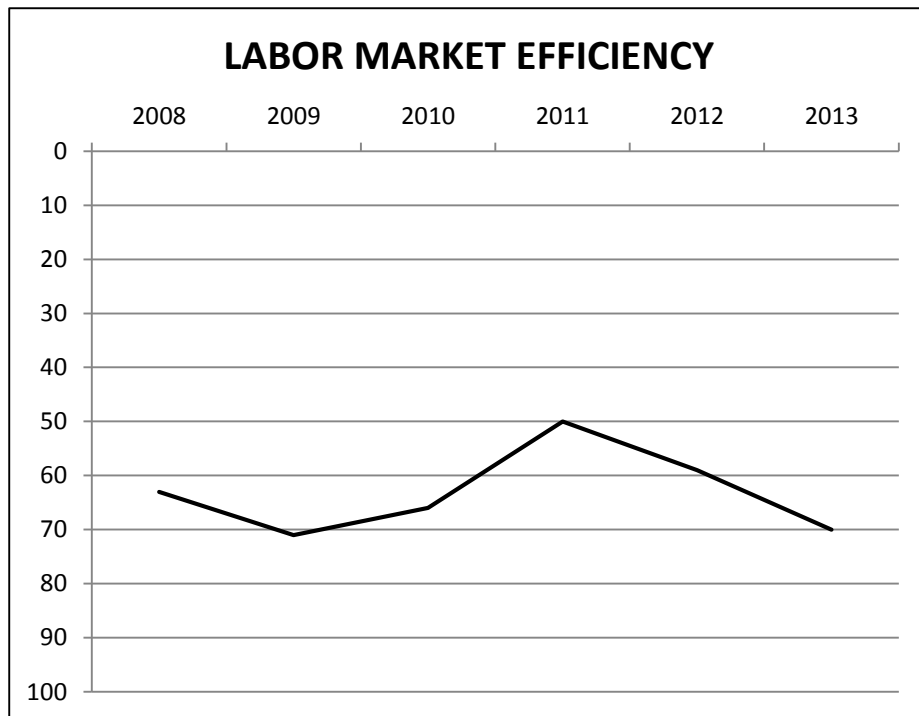
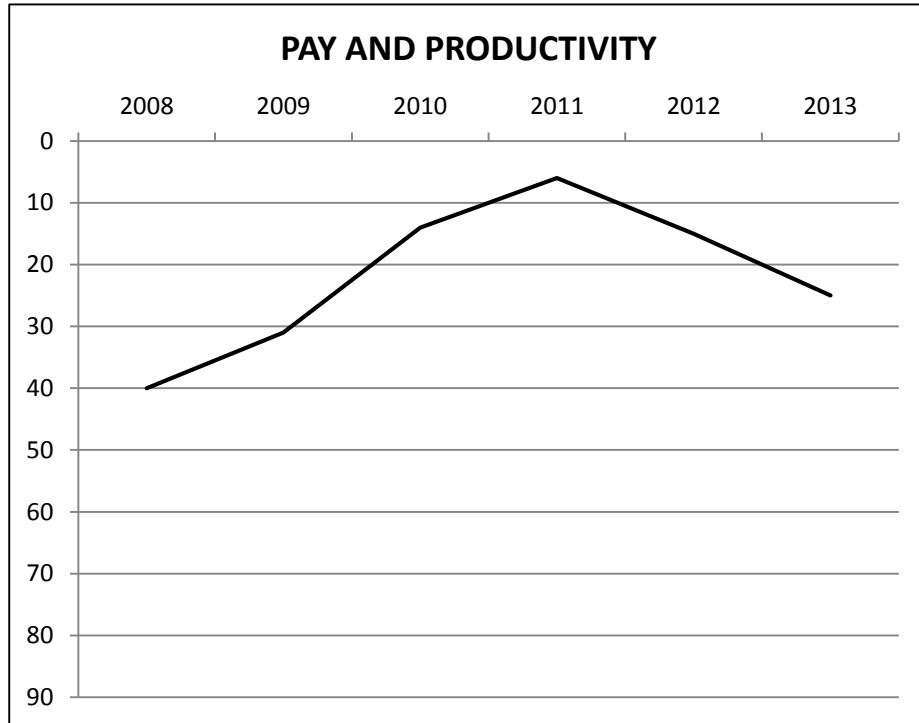


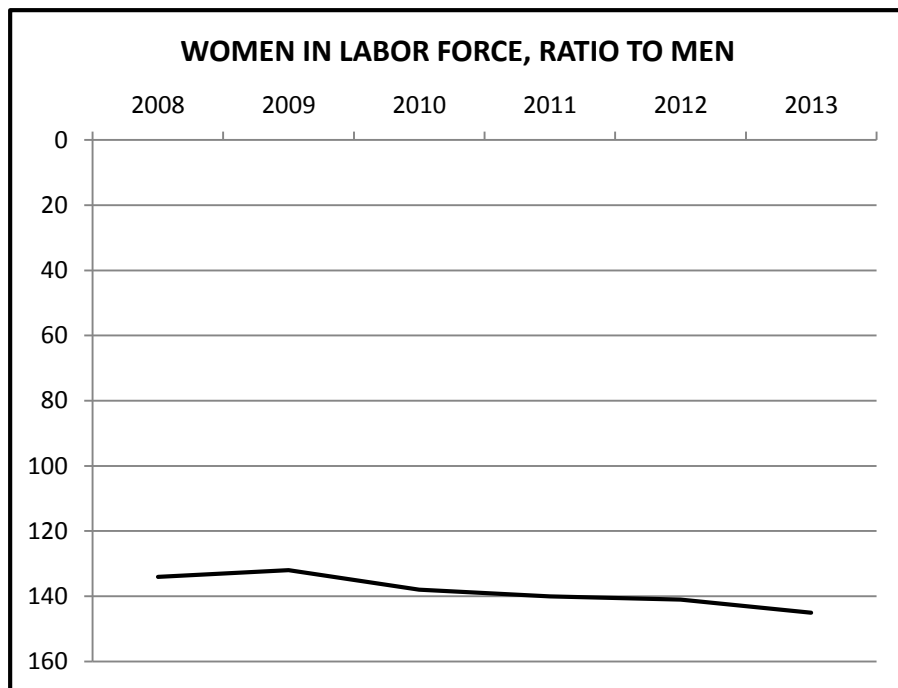
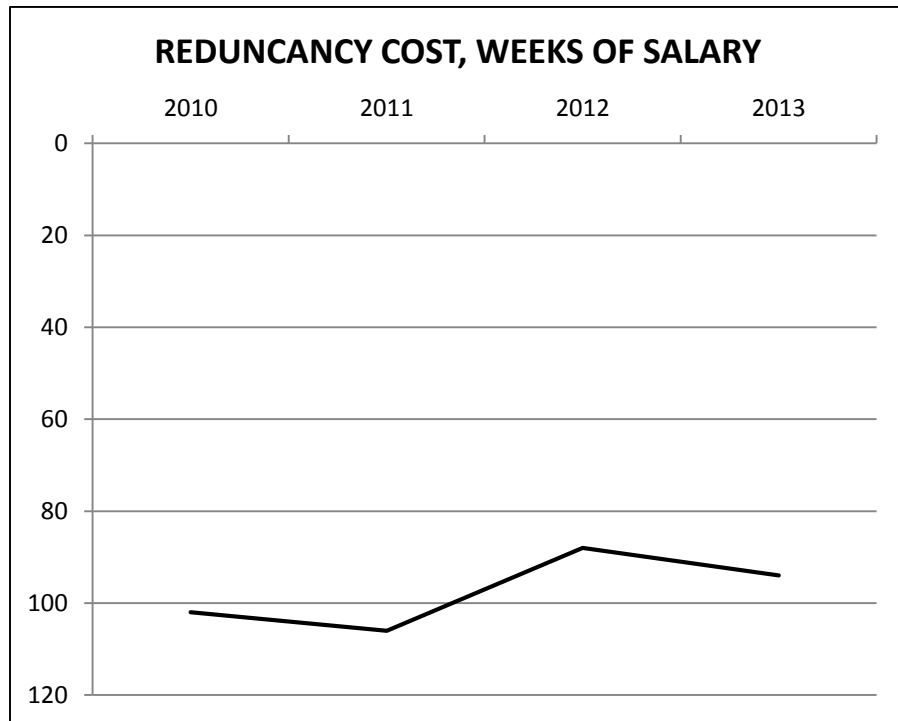


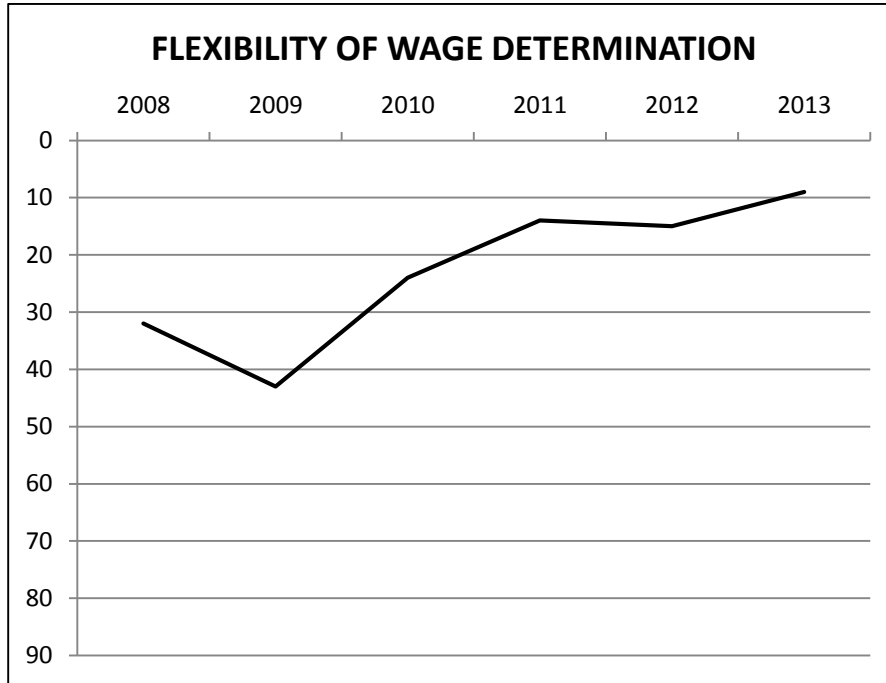


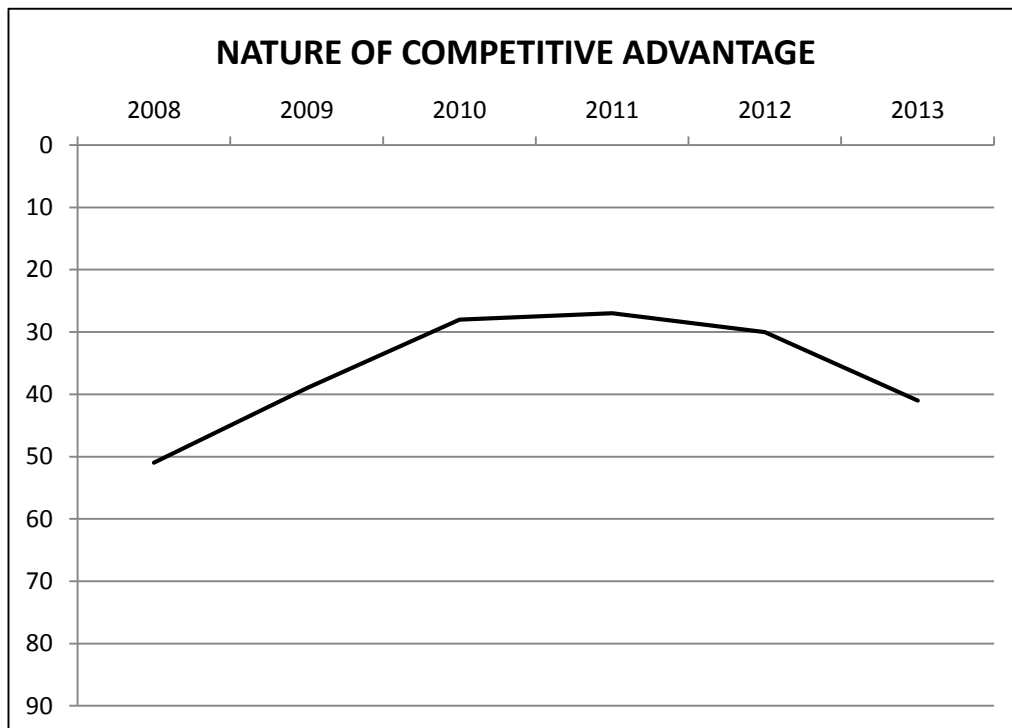
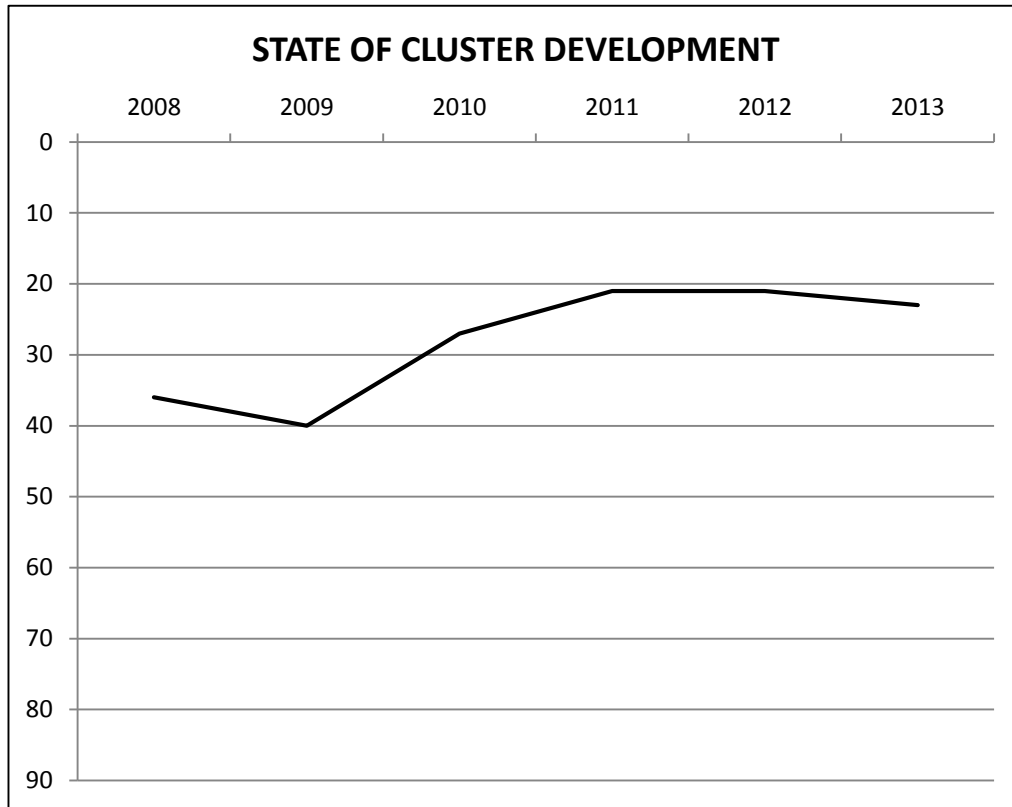


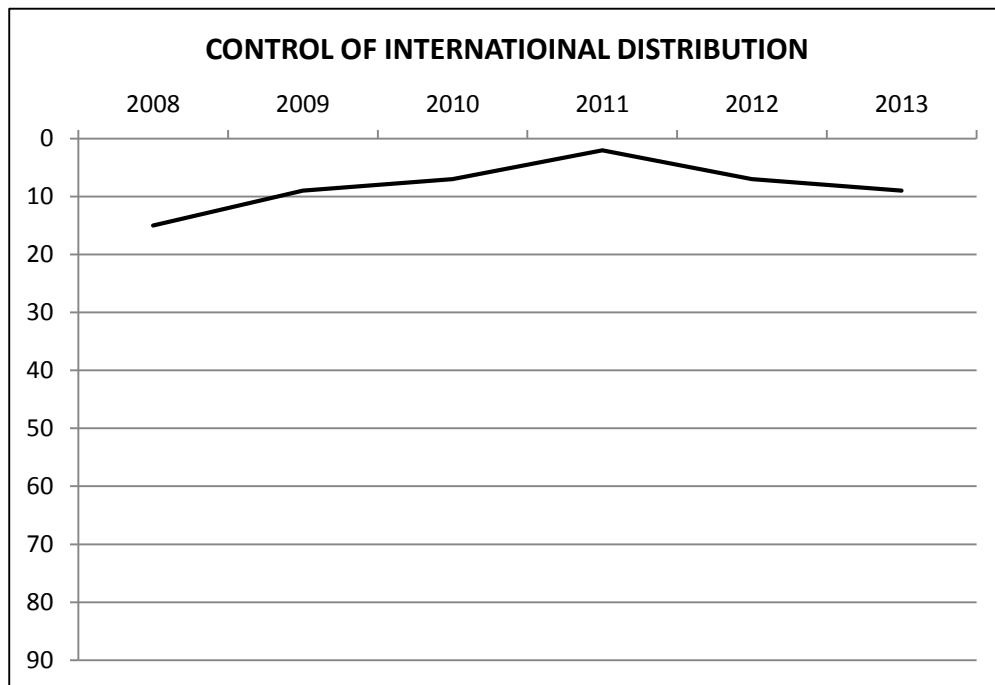
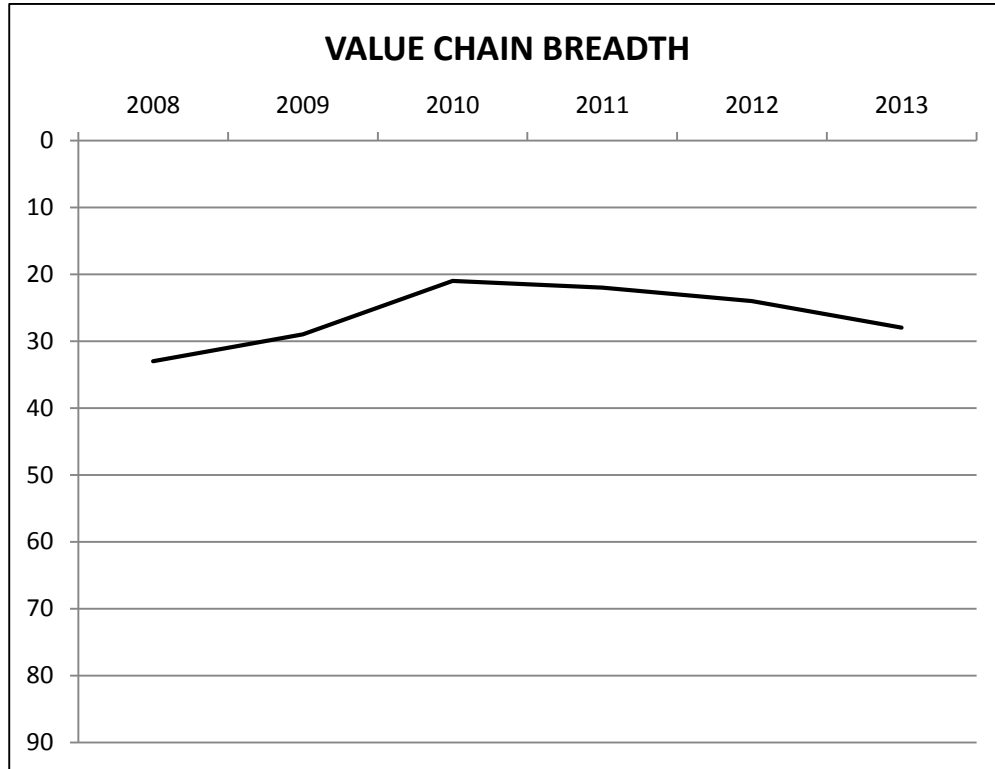


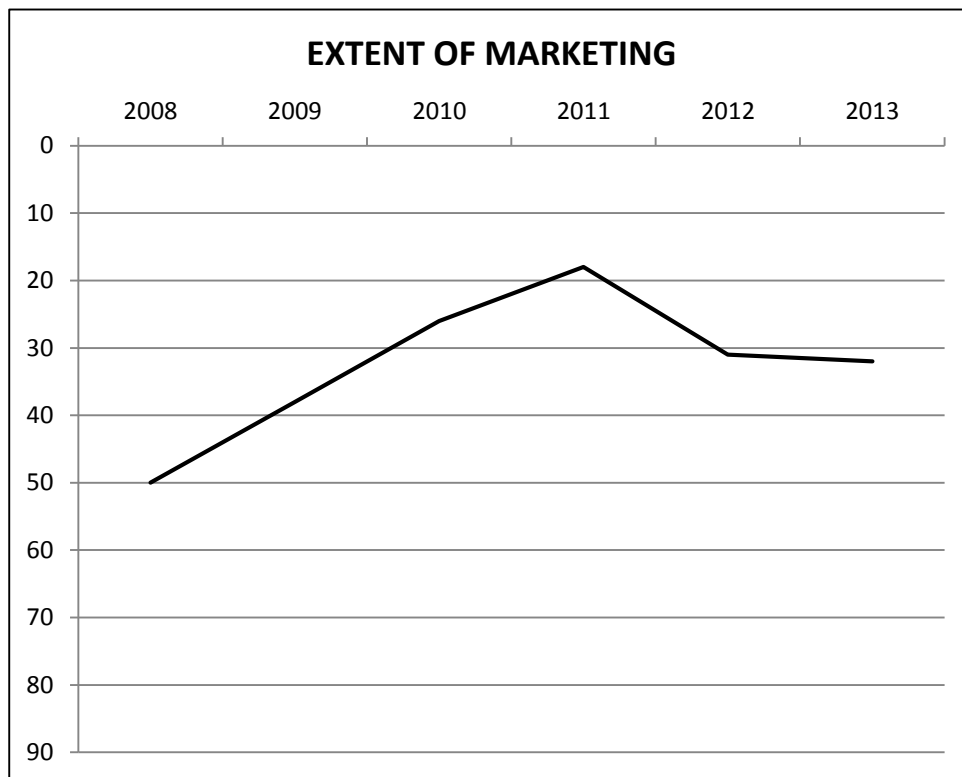
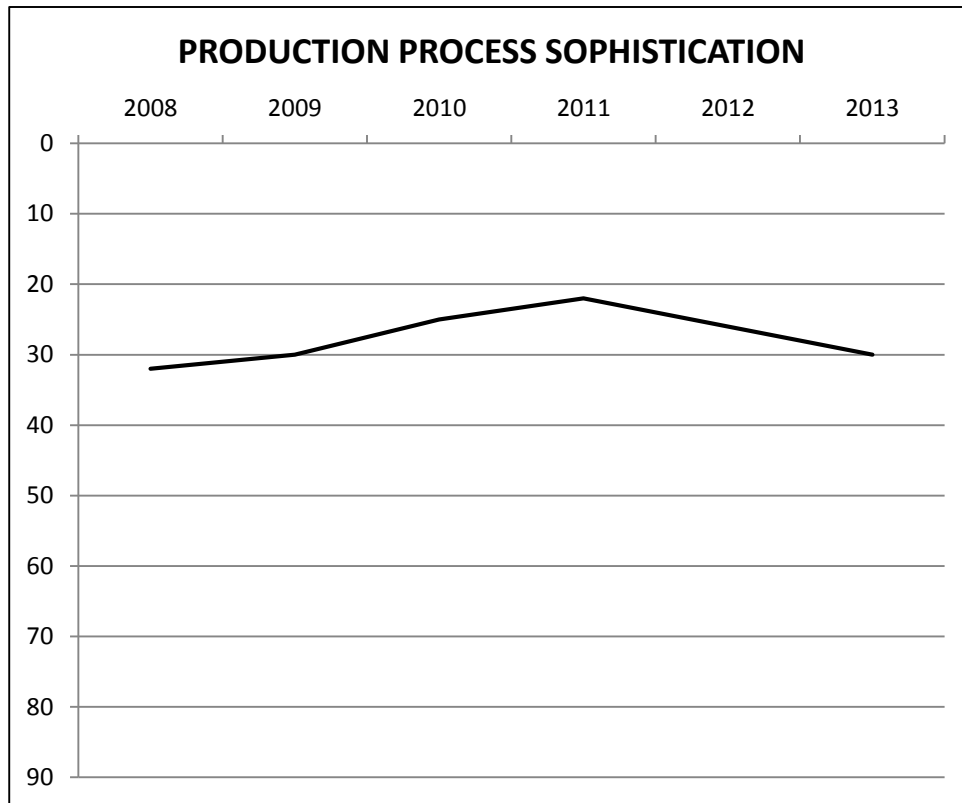


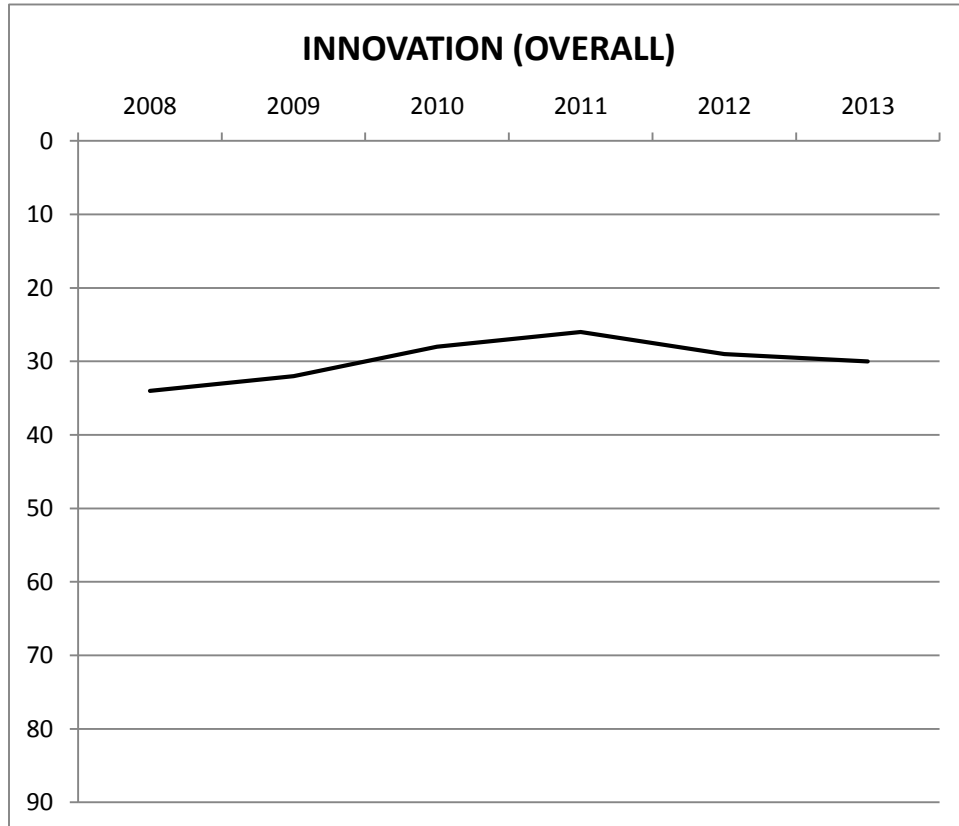
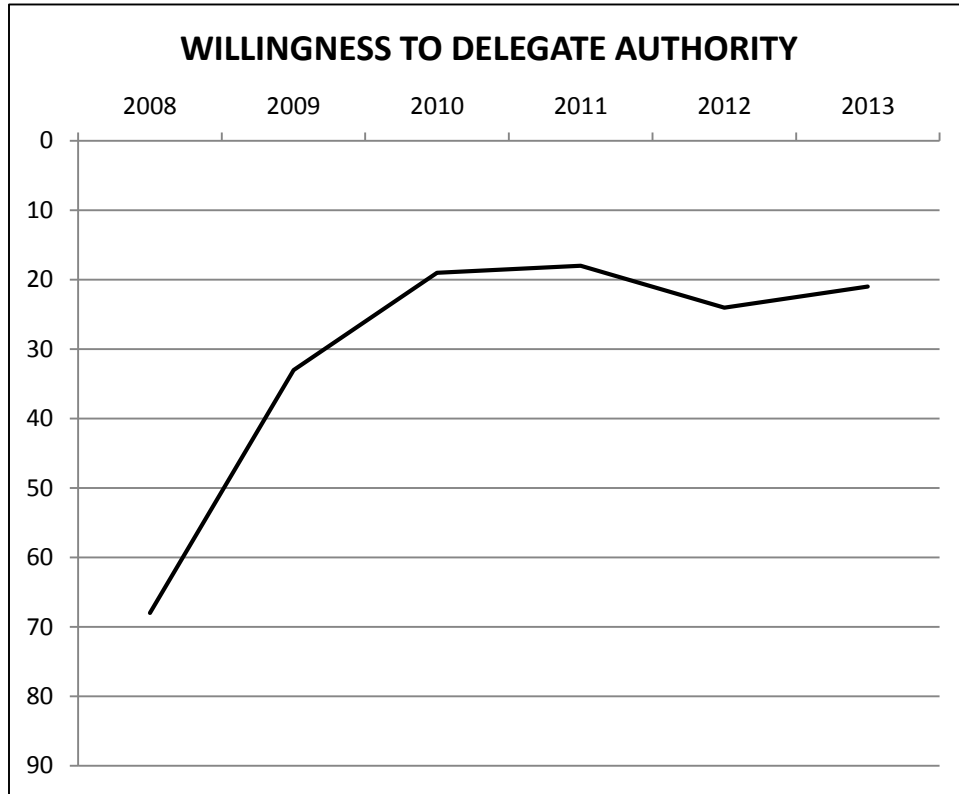


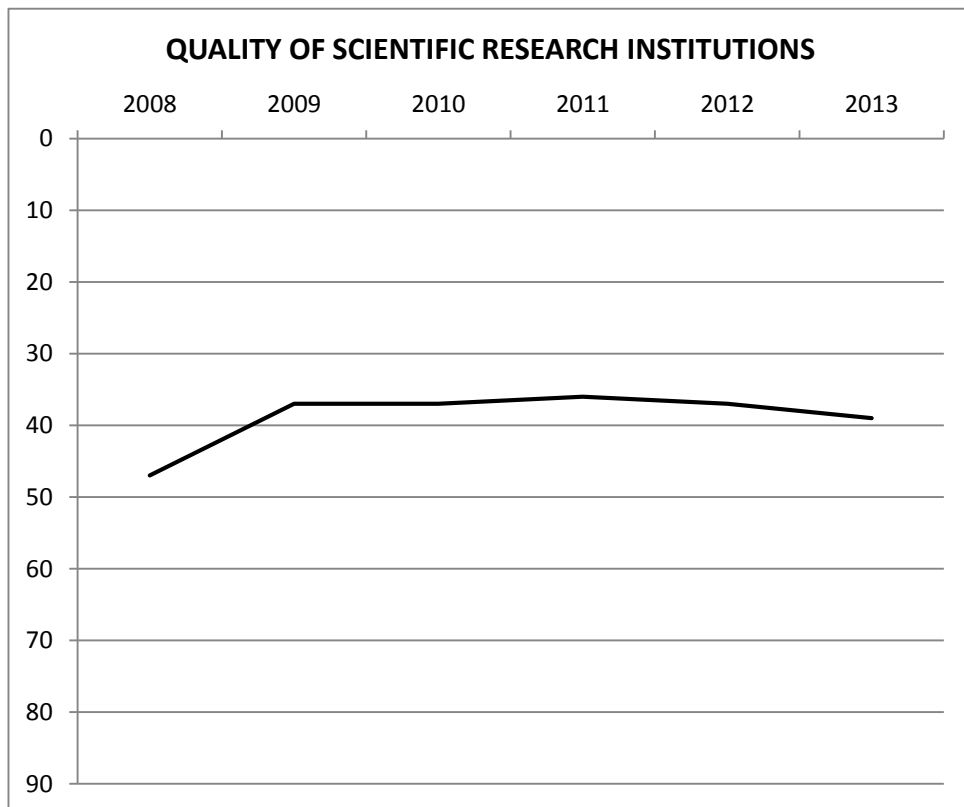
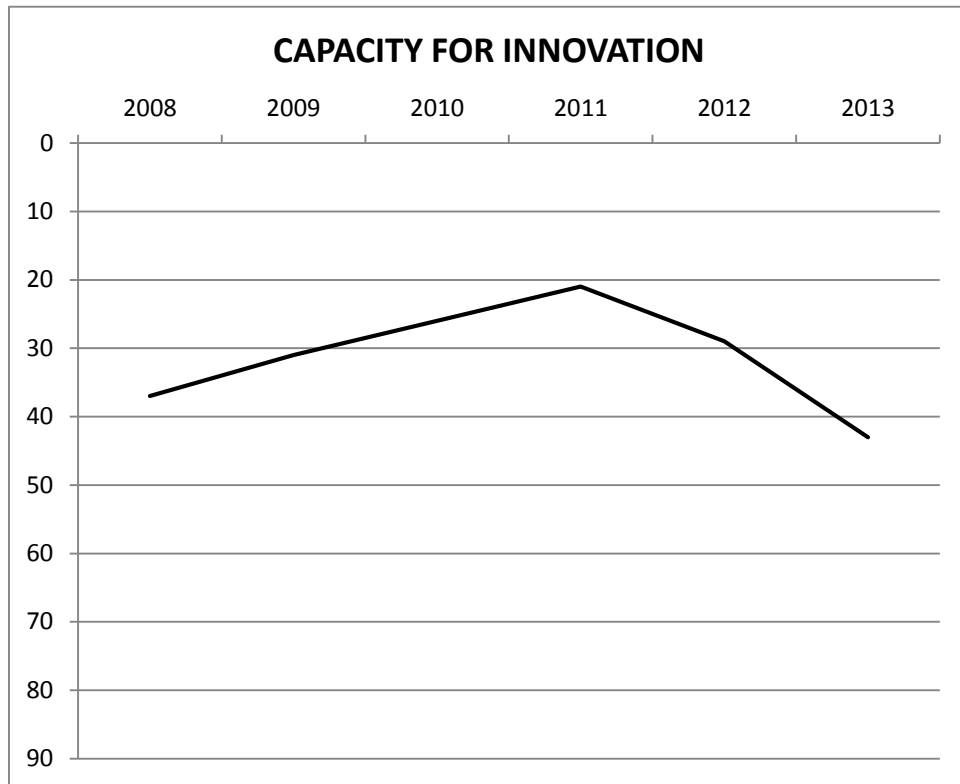


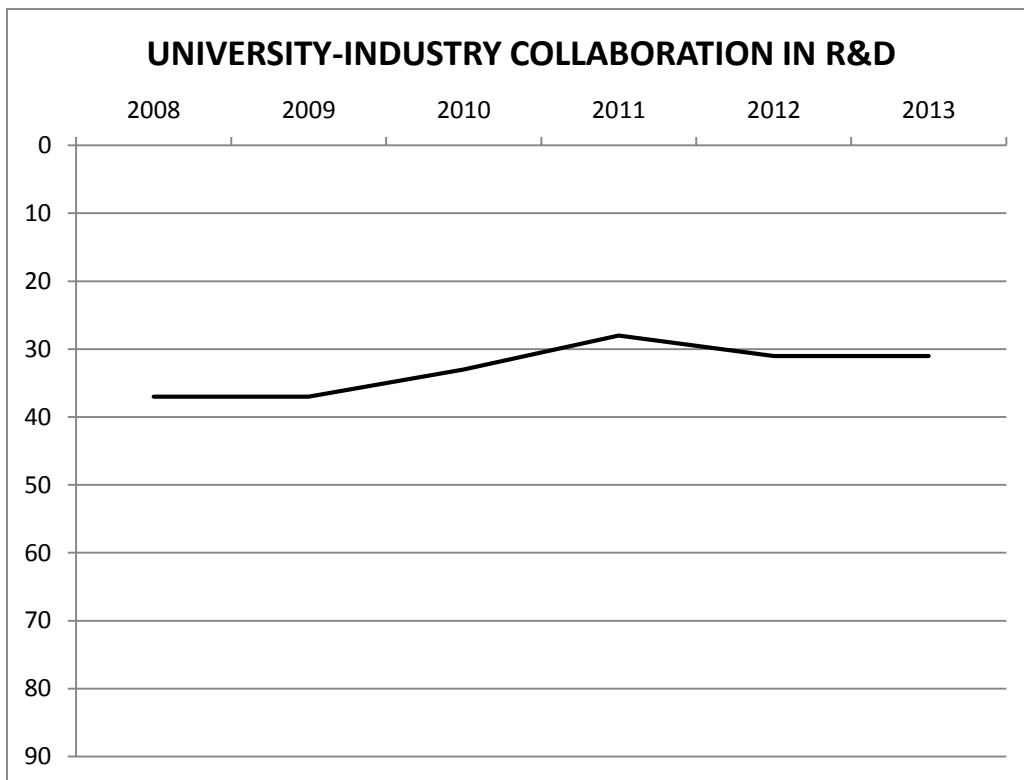
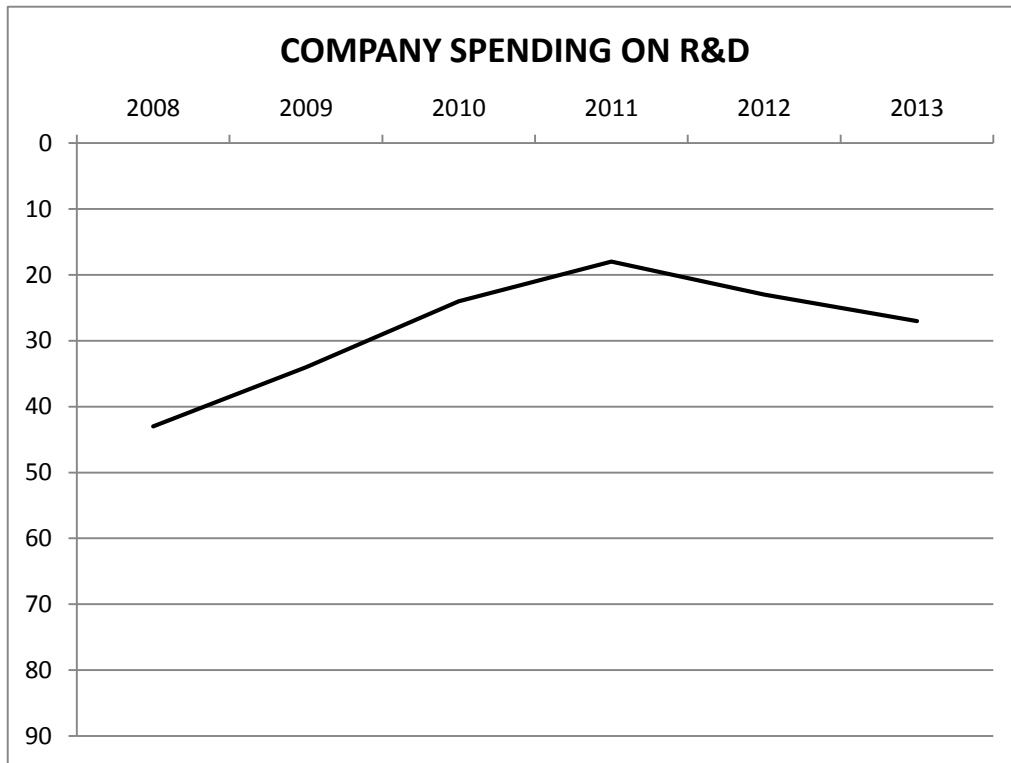


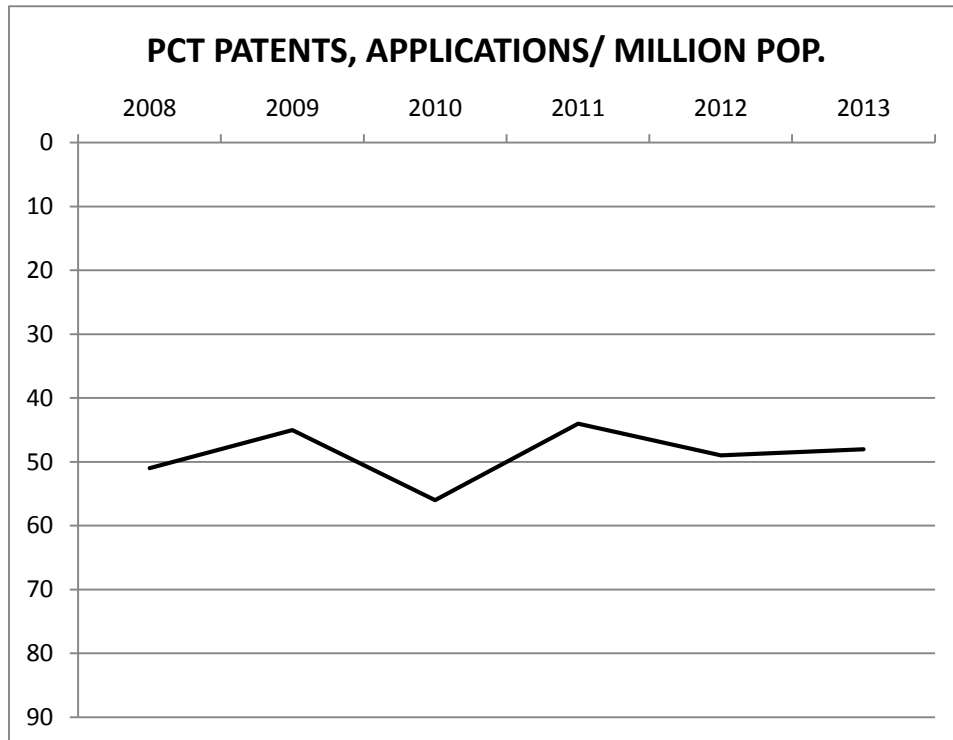
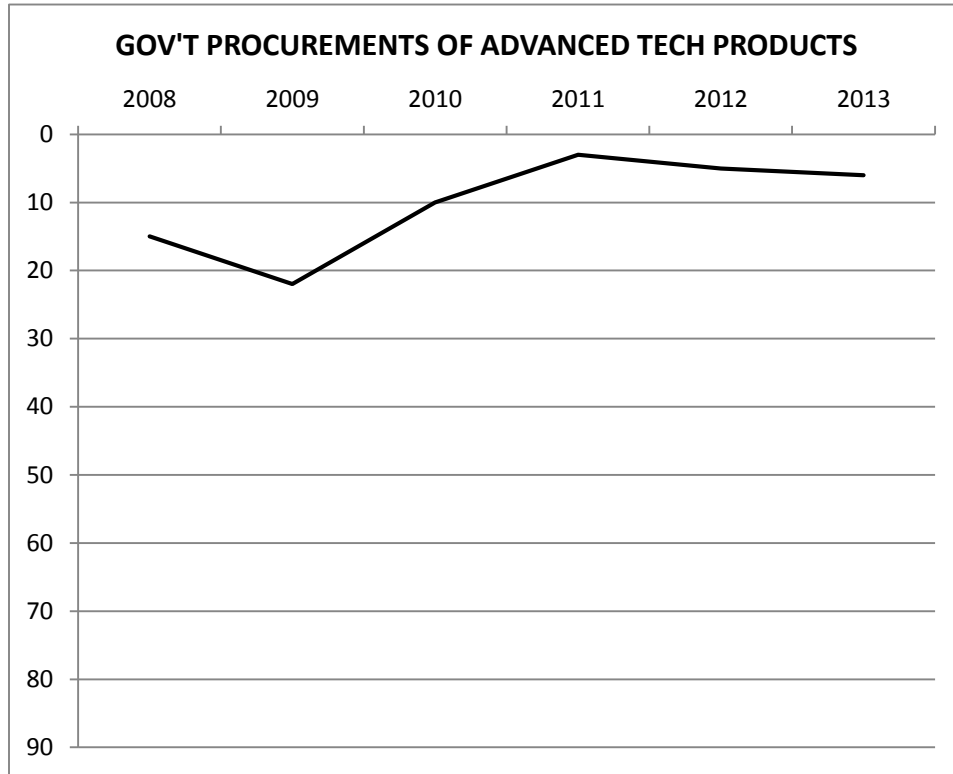


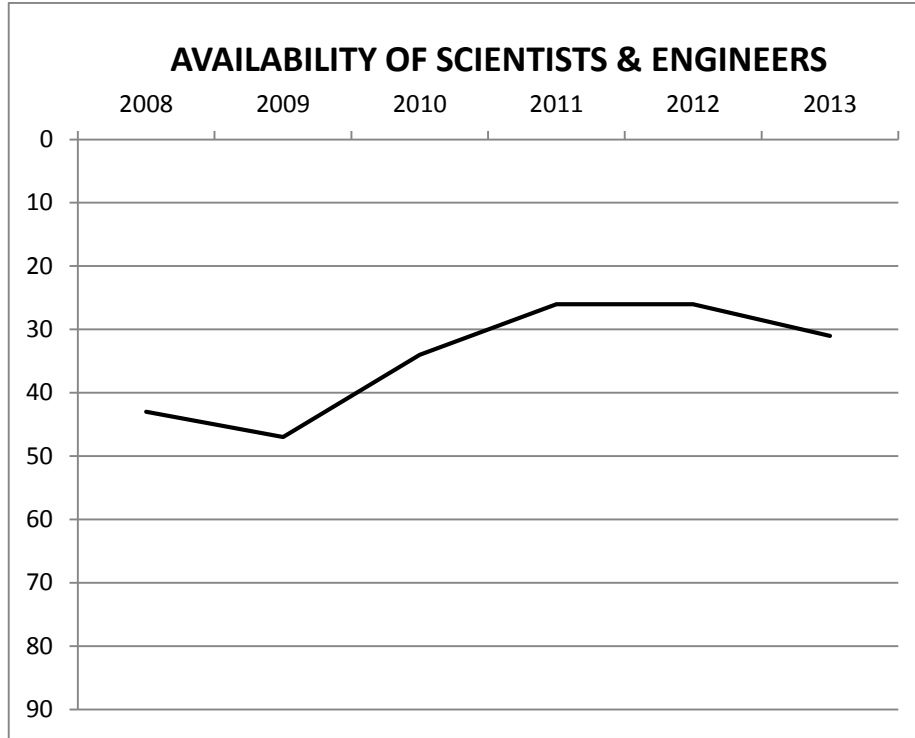












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ABSTRACT**A FRAMEWORK TO IMPROVE A NATION'S
COMPETITIVENESS THROUGH QUALITY AWARDS AND
PERFORMANCE IMPROVEMENT TOOLS**

By

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Each country, represented by its government, aims to serve its citizens better. This is achieved by better utilization of resources and higher productivity. The ability to do so will lead to a competitive nation. Recently, countries were able to compare themselves in terms of competitiveness using international indexes and references. These references gave countries a benchmark to know where they exist compared to other nations. They help governments to understand their strengths and weaknesses within the competitiveness components. However, nations differ in the actions which are to be taken in order to improve their competitiveness. Governments establish and regulate many programs and initiatives to improve areas of weaknesses.

On one hand, a nation's competitiveness is a result of the competitiveness of its organizations. On the other, many governments have established quality awards (or performance excellence awards) to improve their organizations in different industries and to help these organizations to become more competitive. However, these two facts lead to the question: how can a quality award model help nations to improve their national competitiveness among other countries?

This study identified the link between national competitiveness and organizational competitiveness. National competitiveness is defined by the elements of the Global Competitiveness Index report issued by the World Economic Forum. Organizational competitiveness is defined by the criteria of the nation's quality award.

This research also provides a general framework that enables quality awards, through adjustments to its criteria, to help a country to improve its national competitiveness. The study presents a classification of adjustments on the criteria of quality awards over time. This classification can help countries to understand which actions are to be taken and which modifications to be made to the criteria of quality awards in order to achieve better results on national competitiveness.

Digging deeper, the study provides performance tools that can help an organization to improve its performance and have better competitiveness within an organization. Our suggestion includes using Six Sigma, for operational and quantitative projects, and Human Performance Improvement (HPI), for operational and qualitative projects. These two methodologies cover the human and non-human elements of any organizational operations. The study defines and provides a comprehensive comparison between these two methods.

The macro level framework presented in this study can be used by the custodians of quality awards and officials as a guidance tool for which changes and modifications need to be made to the new revisions of quality awards. More specifically, it adds an important dimension to the criteria of quality awards: that they be aligned with the national competitiveness. On a micro level, this study suggests two improvement methods to achieve better competitiveness on an organizational level.

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RESEARCH INTEREST

Quality and Reliability, Statistics, Six Sigma, Quality Management, Performance Improvement.