

# The Disruptive Innovation Theory Applied to National Implementations of E-procurement

Juan Carlos Barahona, MBA, Ph.D., Eng., and Andrey M. Elizondo, M.I.B.

INCAE Business School, Costa Rica

[juan.barahona@alum.mit.edu](mailto:juan.barahona@alum.mit.edu)

[andrey.elizondo@consultor.incae.edu](mailto:andrey.elizondo@consultor.incae.edu)

## Abstract

Due to its characteristics, size, and impact, e-procurement has a strategic importance not only for public administration but for e-government, since its implementation necessarily crosses many institutional barriers and paradigms of many public managers. E-procurement brings a set of new rules and dynamics that create ways of doing business with the State in a totally different fashion, with a whole new and bigger set of participants, new incentives and a radically different cost structure; conditions that have the potential to create a competitive marketplace of unparalleled transparency, efficiency and access.

While worldwide public e-procurement has been linked to a myriad of promises, in practice, it has achieved little. Our research, however, shows that to date literature has failed to recognize that e-procurement is a disruptive innovation, based on also disruptive technologies. A fundamental difference exists between disruptive and sustainable innovations. Empirical evidence suggests the relevance of recognizing a disruptive innovation and its implications as a key success factor. By not considering these implications prior to implementation, strategic actions at the level of organization, resources, people and values, which significantly affects the results derived from the implementation were not considered, and therefore, many promises remain unfulfilled.

The findings of this research contribute to an expanded understanding of the factors that promote successful implementation of nation-wide e-procurement systems at a time when this technology and operational model is widely needed as many governments are struggling with flawed attempts to implement these systems.

**Keywords:** e-procurement, disruptive innovation theory, e-government, public sector innovation, new business model, shared services

## 1 Introduction

In the networked society, as citizens become savvy consumers of services through digital media, they expect a similar experience when it comes to public services. However, the literature and the evidence show that the State has lagged behind in the adoption of new technologies. This trend could be explained by the incremental nature of the State innovation adoption model and its characteristic risk aversion. This is compounded by the complexity and implementation time of technology projects that often exceed the capacity, incentives and permanence of government officials.

These limitations contrast with the growing number of countries and regions pursuing some form of e-government to develop and deliver high quality, seamless and integrated public services, to redefine and improve their government-constituency relationships, and to provide a better support for local, national or international development (Grant & Chau, 2006). In this quest, e-procurement is among the first national wide projects that are undertaken by governments in search for quick economic and political gains, as governments spend approximately 10 to 15 percent of their GDP in public purchases (United Nations, 2011). However, from the e-government perspective, e-procurement has a strategic importance, since its implementation necessarily crosses many institutional barriers and the silo mentality of many politicians, public managers and practitioners.

The documentation of e-procurement implementations and experiences has been based primarily on relative successes rather than its failures or unmet promises. Our literature review reveals a list of key success factors, but it also reveals that many of major promises associated with e-procurement, have not been met. It also shows that to date, all sources found failed to recognize that, for a conservative industry such as the public sector, e-procurement is a disruptive innovation. This is important because such innovations not only radically change the rules and the traditional way of doing things, but have serious implications for the design of the organization and the team that will implement and develop these initiatives.

This paper seeks to underscore the relationship between national e-procurement implementation and the consequences of a disruptive innovation. This is vital to a more complete understanding of why some efforts have progressed more than others. Empirical evidence suggests that this distinction has greater relevance since successful cases tend to coincide with organizational arrangements and the strategy to be followed by organizations that choose to adopt disruptive innovations. This could well explain literature gaps regarding the role of innovation adoption theory in the implementation strategy and in the organizational design of e-procurement national services.

This is pertinent globally. Efforts are being made across the planet to implement e-government and, although e-procurement has been one of the initial components in this incursion, it is still an early implementation. It is also important for administrations fostering e-procurement projects because most recent technological changes, although even more disruptive, when well designed and managed, substantially increase the probability of achieving their promises. In fact, they may become the technical and administrative foundation for subsequent e-government projects.

## **2 Research Question**

What are the design criteria required to maximize the possibility of a successful public e-procurement strategy in view of its disruptive nature and the fundamental role it must play in contributing to building the foundation for e-Government development?

## **3 Methodology**

This research design is based on an action-response framework. Our research focuses on the relationship and parallel of the characteristics and conditions of e-procurement, and those of a disruptive innovation, and implications associated. We determine that nationwide e-procurement satisfies the criteria for a disruptive innovation: It represents a new way of competing in an existing industry that is both radically different from and in conflict with the traditional way.

We reviewed the available published empirical evidence, starting with the literature on general concepts and descriptions of public e-procurement. From this, we were able to list the most common e-procurement promises and benefits, and rank the ones considered key success factors for implementation. We then reviewed cases documenting e-procurement implementation in countries or regions. The literature showed that many of the promises had not been met and that some of those implementations had been cut short or aborted.

By analyzing international experiences, we identified the characteristics and conditions affecting e-procurement platform adoption and implementation.

An extensive review of the literature on innovation adoption –success and failures- gave us a list of characteristics and conditions defining a disruptive innovation. We then examined where the characteristics and conditions -of e-procurement and a disruptive innovation- converged. Due to the match of characteristics and conditions of e-procurement with a disruptive innovation, we proceeded to analyze the organizational consequences and implications when implementing a disruptive technology.

By not considering these implications prior to implementation, strategic actions at the level of organization, resources, people and values, which significantly affects the results derived from the implementation were not considered, and therefore, many promises remain unfulfilled. While a gap exists in the literature because until now the two concepts – e-procurement and disruptive innovation – had not been linked, we were able to obtain a sample of e-procurement models and implementation experiences in 40 countries. We collected data, based on the empirical evidence available in the literature and official Web sites. We revised the experiences of 40 nationwide e-procurement implementation in various European, Latin American and Asian countries; taking into technological functionalities of the platform and organizational aspects of the entity that operates it. Following the revision, we prepared a general matrix with information of the cases studies categorizing the insights that were generated.

Finally, in order to see if what are considered advanced platforms and e-procurement models obeyed arrangements, conditions and procedures normally used to implement a disruptive innovation, we

classified the countries using two criteria: 1) technical maturity of the platform, according to the practices implemented (Moon, 2005); and 2) organizational and institutional arrangements used for implementation.

#### **4 The Context: Expectations and Governance in the Interconnected Society**

The rhythm and scope of IT in the past century was different from that in this century. In the past, governments progressed at a slower pace when adopting new technologies. Public Administration has an aversion to risk that alters decision-making, trend that is deepened by incentive systems, traditional decision-making patterns, account rendering mechanisms, hierarchal and rigid organizational structures, roles, motivation, size, resources, communication processes, institutional values and more (Moon, 2005) (Berry & Berry, 1999).

Incrementalism in the adoption of new technologies is inherent to the nature of the public sector, keeping governments below the technology adoption curve (Lindblom, 1959). When technology was oriented towards automation (Rogers, 1995), this was consistent with the incrementalist nature of governments.

Recent evolution enables very different forms of public sector organization (Dunleavy, et al., 2005) (Fernández-i-Marín, 2011) (Margetts, 2009) (Suk Kim, 2007). At the very time when citizens expect more from the State, the current scenario is undergoing a complex transition. The State must live side by side with information age implications, with the inevitable Internet media that enables and reconfigures the distribution of power of several actors and with a growing number of interconnected citizens. New disruptive technologies –Internet services, social media, collaborative platforms, cloud computing- enable the development and diffusion of new disruptive models to provide services. Therefore, it carries with it the need to incorporate the knowledge and the tools for designing and managing innovation into the abilities and skill sets of public leaders and administrators.

#### **5 Challenges and Contradictions in Traditional Public Procurement**

Public procurement or State purchasing refers to the buying of goods and services on behalf of a public authority, such as a government agency (United Nations, 2011). Diverse political, economic and social aspects converge on the subject, since governments spend public resources to achieve their objectives and create public value (Thai, 2001) (Tether, 1977) (United Nations, 2011). Good governance depends on compliance with the basic principles of transparency, integrity and account rendering (Wittig, 2003) (Rasheed, 2004).

An open and transparent procurement process improves competition, increases efficiency and reduces the risk of unfairness, fraud, corruption, waste, and the mismanagement of public funds (Thai, 2001) (United Nations, 2011). These are strong reasons to ensure management regulated under adequate controls, multiple processes, regulations and contractual systems.

Transparency takes form in a variety of practices: publishing; advance publication of procurement plans; advertisement of tender notices; disclosure of evaluation criteria in solicitation documents; publication of contract awards and prices paid; establishing appropriate and timely complaint/protest/dispute mechanisms; implementing financial and conflict of interest disclosure requirements for public procurement officials; and publishing supplier sanction lists (United Nations, 2011).

Each of these practices is supported and followed by complex legal regulations and internal procedures of every institutional agency. Mechanisms that in the traditional –non electronic- system, require a great deal of human intervention. This dynamic approach results in a paradox contrary to efficiency, effectiveness and savings and therefore against the objectives mentioned.

#### **6 E-procurement on the Road to E-government**

In view of its potential, scope and impact, the effective implementation of procurement processes through electronic means or e-procurement, is one of the first projects that governments seek to develop with regard to e-government (OECD, 2003) (OECD, 2004) (KSCeG, 2003), rallying support on the basis of its attractive promises and goals. The literature has consistently pointed to these promises:

- Increased levels of transparency
- Ease of access to government information
- Elimination of entrance barriers
- Entry for every size institution
- Entry for every size bidder
- Increased efficiency in the governmental sector
- Better use of public resources
- Cost savings in goods and services purchased
- User/citizen focused online services
- Technological Integration / interoperability

The literature shows that e-procurement has been approached from several dimensions. Beyond the conceptual aspects, the promises, rhetoric and documentation of early implementation cases, the subject has also been studied from the technological or information systems dimension (Panayiotou, et al., 2004) (Kishor, et al., 2006) and from the management or strategic dimension (Coulthard & Castleman, 2001) (Rajkumar, 2001). Attempts have also been made to measure its economic impact and benefits in multiple areas. Nevertheless, the latter is not relevant in terms of the success of future implementations, nor will it affect the direction towards integration and digitalization. Will it perhaps fail to evolve consistently with regard to public purchasing or will it forestall going in a direction other than the prevailing e-government logic? Besides the savings derived from e-procurement, and given technological advances, its strategic value lies in paving the way for the creation of the interoperability platform required for the next electronic government developments. This extends from information architecture and web-based service rendering models, to service governance and the platform itself.

Our research question is not a trivial issue. Across the globe, investment and efforts have been important, but many initiatives remained merely partial solutions, or were aborted, with limited possibilities to grow in the effective delivery of service, so that general progress in real terms has been slow and not significant. Nor have adoption and diffusion processes between purchasing institutions and supplier companies progressed as anticipated. There is a need to improve our knowledge of what it takes to avoid failure and allow the advancement and development in such an important endeavor. We have compiled the most frequently success factors quoted by bibliographical sources, for e-procurement nationwide implementations, and listed them by their frequency in Table 1.

**Table 1. Ranking of Success Factors Quoted in the Literature for E-procurement Implementations**

<b>Success Factor</b>	<b>Literature</b>
Explicit diffusion and change management strategy	[4] [16] [1] [3] [11] [15][7] [14]
Strategic management / Service and management orientation	[16] [5] [13] [11] [15] [12] [8]
Flexibility/capacity to incorporate all types of buyers/suppliers	[4] [16] [3] [11] [15] [14] [2]
System interoperability and integration	[4] [16] [5] [6] [7] [12] [2]
State capacity to adopt innovations	[10] [8] [19] [11] [7] [12]
Leadership and political support	[16] [8] [19] [3] [7] [14]
Security and control	[16] [15] [7] [12] [2]
Data and code standardization	[4] [16] [6] [15] [7]
Trained human resources: Hiring, development and retaining talent	[4] [1] [8] [9] [13]
Handling relationships with institutions/suppliers	[13] [3] [15] [14]
Process re-engineering	[4] [16] [7] [12]
Robust technological platform	[4] [15] [12] [2]
Performance measurements/benchmarks	[4] [16] [12]
Expertise in public purchasing /Inclusion of best practices	[4] [10] [16]
End user training / knowledge management	[16] [11] [4]
Scalability potential /incorporation of new services	[10] [7] [14]
Legal Framework	[10] [15]
Coverage/Internet access	[13]

Source: (Al-Moalla & Li, 2010) = 1, (Barahona, et al., 2009) = 2, (Chan & Lee, 2003) = 3, (Commonwealth of Australia, 2005) = 4, (Croom & Brandon-Jones, 2009) = 5, (DeNardis, 2010) = 6, (Engström, et al., 2009) = 7, (Ha

& Coghill, 2006) = 8, (Hyoung Lim, 2010) = 9, (Moon, 2005) = 10, (Pires & Stanton, 2005) = 11, (Rahim, 2008) = 12, (Reddick, 2004) = 13, (Teo, et al., 2009) = 14, (UN ESCAP, 2006) = 15, (Vaidya, et al., 2009) = 16

Table 1 shows that little consideration is given to the government's capacity for innovation or to adopt innovations. In addition, there is little evidence compiled on the role of an organizational arrangement coherent with the type of innovation being implemented. Furthermore, there is no evidence on the particular subject of disruptive innovation.

We claim that there is a conceptual vacuum: the literature does not refer to the fact that e-procurement implementation in the public sector corresponds to the implementation of a disruptive innovation. Consequently, literature has not been able to consider what the appropriate organizational arrangement should be, which does not allow exploiting the full potential associated with e-procurement, so it still cannot fulfill many of the most important promises.

## **6.1 Disruption in public procurement**

E-procurement is an innovation and, as such, requires management (Somasundaram & Damsgaard, 2005) (Govindarajan & Trimble, 2010). To manage innovations, it is fundamental to differentiate between the types of innovation. Future decisions that may be vital to the success of the implementation depend on understanding the type of innovation (Trott, 2011).

Sustained innovations are those that have a constantly improving track record within a typical level of competition. Organizations are continually improving their products or services in response to customer demands. This dynamic approach is predictable and can guaranty success because needs remain stable over time (Bower & Christensen, 1995) (Christensen, 1997).

Unlike sustained innovations, disruptive innovations do not constitute an improvement in the performance of an existing product or service. This is true because instead of maintaining a constantly improving track record, disruptive innovations tend to disrupt this track record, generating a product or service radically different from the one being offered, radically changing the rules of the game, and allowing for the actors who were not covered under the traditional model (Bower & Christensen, 1995) (OECD, 2005).

Disruptive innovations have the following characteristics (Christensen, et al., 2002) (Bower & Christensen, 1995) (Christensen, 1997) (Christensen & Overdorf, 2000):

- Initially there is no demand for them, the client base is small and may be costly
- Initially they are not attractive to the best clients
- At some level they exceed the current abilities of traditional clients
- They are at a new level of competition
- The meaning of quality and improvement are different from those in the traditional model
- They address potential sectors/clients that under the prevailing logic would not have access to the product or service
- Initial profit margins may be small

We claim that advanced e-Procurement complies with the characteristics and conditions of a disruptive innovation.

Internet-based technology is one of the most pervasive change factors for procurement. They can provide easy and real-time access to information, new ways for interaction between bidders and government officials, and facilitate the monitoring and tracking of information on procurement (OCDE, 2007).

An advanced e-procurement platform enables creation (e-bidding) and approval of purchasing requisitions (e-evaluation), the placement of purchase orders (e-ordering) and receipt confirmation of goods and services (Panda, et al., 2010).

Modern technology makes it possible to have a unique database of products (e-catalogue) under a global product classification. This allows the platform to consolidate purchases as well as allowing new forms of offering and bidding.

From the standpoint of purchasing, institutions using an advanced e-procurement platform to buy goods and services from a number of known or unknown suppliers, enables reverse auctioning (e-auction) (Panda, et al., 2010), a process where the sellers compete to obtain business from the buyer and prices will typically decrease as the sellers undercut each other.

It also allows for a unique national registry of providers and products, which automatically creates a national base of suppliers, as opposed to a small set of vendors willing to register for a small subset of institutions

A national platform for advanced e-procurement will relocate most of the technical knowledge from traditional procurement experts, administrative lawyers and institutions to the platform itself, lowering the entrance barriers for small suppliers previously unable to participate in this market. It will also make it possible for small public organizations to be as effective as the big ones.

All these new conditions and dynamics create ways of doing business with the government in a totally different fashion with a whole new and bigger set of participants, with new incentives and a radically different cost structure.

This has the potential to create a competitive marketplace of unparalleled transparency. See Table 2.

**Table 2. Rationale on the compliance of e-procurement with the characteristics and conditions of Disruptive Innovation**

<b>Characteristics of a Disruptive Innovation</b>	<b>E-procurement rationale</b>
Initially there is no demand for them, the client base is small and may be costly	Supplier's perspective: Big sellers already know how to operate the traditional system and its cost and complexity act as an entrance barrier. Most small and medium enterprises (SME) do not regard public institutions as their potential client and are not willing to invest time and money in learning since it is complex, expensive and usually perceived as non-transparent. Buyer's perspective: most will argue that they are somewhat unique and will argue that it is better to keep the processes internally controlled.
Initially they are not attractive to the company's best clients	For those already selling, all existing hurdles act as a protection against new entrants.  For large buyers, the lack of an effective efficient national system has led them to set up their own systems and they will distrust any attempt to do something on a national scale that will eliminate the system they use.
At some level they exceed the current abilities of traditional clients	Without an advanced e-procurement system, sellers have significant knowledge of administrative contracts. They know "who is who" to influence their purchasing bids and awards and they have on-site professional bidders who are experts "navigating" the system and dealing with all the red tape. An advanced e-procurement system incorporates the technical and legal know-how in its electronic code (software), evaluations are mechanized and the face to face contact between buyers and sellers tends to disappear.
They are at a new level of competition	If the barrier involving purchasing through manual or fragmented systems is lowered, then new competitors will arrive. Locally, smaller companies are adopting the tool due to lower costs and simplicity, but it will also facilitate international bidders as well.
The meaning of quality and improvement are different for each model	It will go from a legalistic system, which mostly controls compliance with regulations, to one that is focused on customer service and running a robust technological platform under concepts such as service level agreements.
They address potential sectors/clients that under the prevailing logic would not have access to the product or service	The advanced e-procurement system facilitates joint purchases. It also makes it easier for several small organizations to use the system to participate in larger bidding rounds without joint coordination. More small bidders can participate in small and large purchases.
Initial profit margins may be small	This is not as clear for the State, but the objections to the project often involve cost benefit reasons, favoring versions of e-procurement that simply use Internet to upload and download pdf's, without any real change in the business model. It is not until the system is fully online and horizontally integrated; enabling radical new forms of State purchasing that e-procurement promises are finally met.

*Source: Characteristics of a Disruptive Innovation prepared based on (Christensen, et al., 2002) (Bower & Christensen, 1995) (Christensen, 1997) (Christensen & Overdorf, 2000) (Charitou & Markides, 2003)*

## **7 Organizational implications from e-procurement as disruptive innovation**

In many countries, the procurement process has been delegated to departments and agencies while the central procurement authority has centralized more strategic functions such as the management of new technologies as well as the dissemination of knowledge and good practice (OCDE, 2007). In most cases, the rectory in public procurement is in charge of a central government body, which is usually the Ministry of Treasury or Economy.

Disruptive technologies entail business model disruptions since they alter the relationship of the organization with its customers and suppliers, upset the traditional way of doing things and the financial arrangements created for its current marketing and technology (Christensen, 1997) (Paap & Katz, 2004).

In this case, the ability of an organization to innovate is a precondition for successful implementation of innovations and new technologies. It is difficult for an already traditional and established organization to respond effectively to a disruptive innovation and this difficulty is greater for public entities.

Ordinarily, organizations - both public and private - delegate the implementation of a new project to a department, internal area, or work team within an organizational structure. No matter the arrangement, these teams must be able to fit the project into the organizational culture, values, processes, structures and resources. These elements were designed for tasks directly related to core business. A disruptive technology under these conditions is doomed to fail (Christensen, 1997) (Christensen & Overdorf, 2000) (Charitou & Markides, 2003) (Thomond, et al., 2003).

Disruptive innovations require a new set of resources, processes and values. They must face significant hardship to overcome challenges based on organizations that serve the industry while threatened by this disruption (Govindarajan & Trimble, 2005) (Christensen & Overdorf, 2000), for example:

Resources supporting business as usual

- People, technologies, product designs, brands, customer and supplier relationships—rarely match those required for disruptive ventures.
- Changes in the company's relationship with its clients and suppliers.
- Marketing: attempt by the Innovative vendor for adoption by market.

Processes supporting the established business

- Old decision making protocols, coordination patterns
- Definition of product performance on the disruptive market totally opposed to the improvements required to triumph under the traditional competition model.

Values in which the traditional organization is based

- Beliefs, old paradigms, assumptions of the traditional model
- Excessive precautions and dependence of the incremental innovation, to the detriment of transforming or disruptive innovations.
- The potential of disruptive innovations, don't be underestimated, because of their immaturity.
- A belief in the growth without new sources of innovation.

For instance, in region C in Figure 1, there is a disruptive change that does not fit the organization's existing processes or values. This complexity could pose challenges and opportunities within the organization, obligating it to change management practices and giving rise to new organizational forms (Lam, 2005). This means that a viable introduction of a new product or service based on a

disruptive technology makes the case for a new and independent organization with other values and skills, not threatened by the new possibility of how to do things, and that does not see the possible market in the same way as the threatened entity. It does not keep anything from the one it is replacing. At the highest level, it may have a contact or two that facilitate the use of some resources; but the new one “forgets” how the original one did things and how it saw its clients. Otherwise, there is a risk that the new organization will remain immersed in the assumptions, values and decisions of the parent company (Mintzberg, 1979) (Christensen, 1997) (Slater & Mohr, 2006).

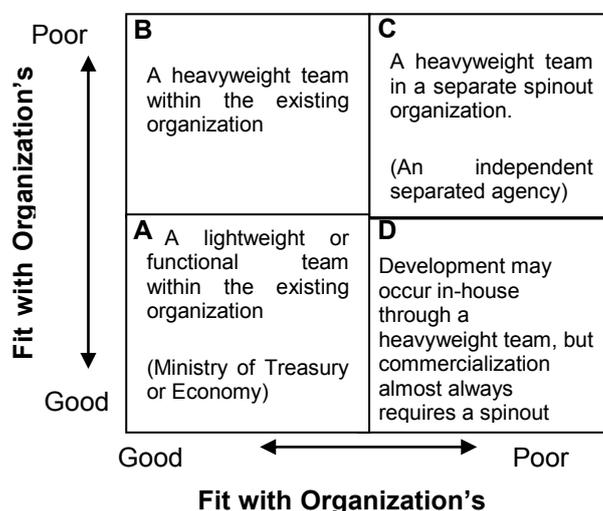


Figure 1. Organizational Considerations of Sustained and Disruptive Innovations

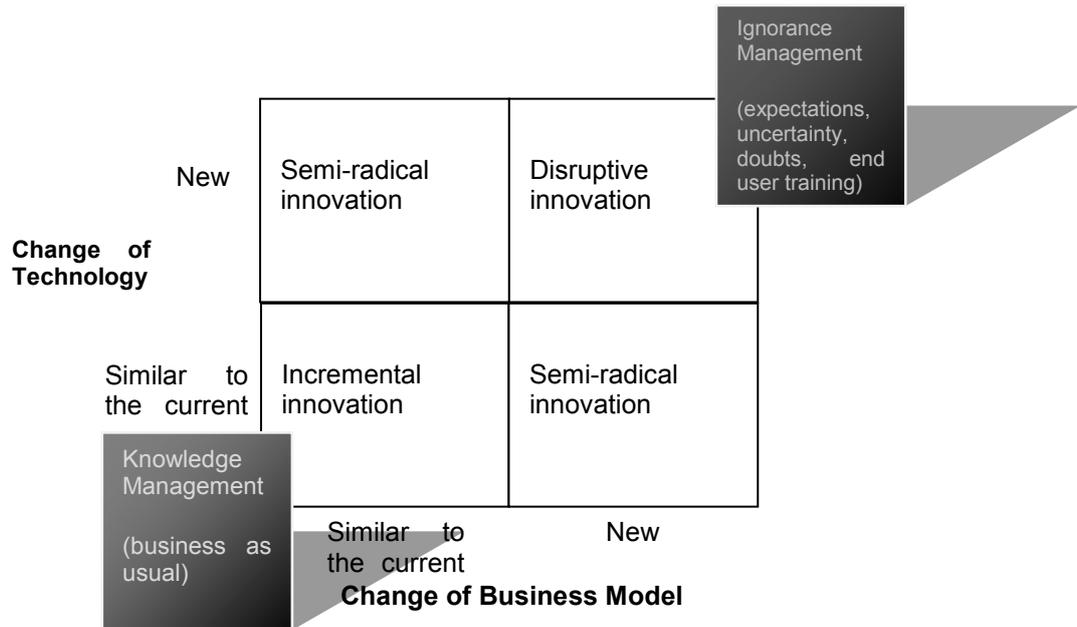
Source: Taken and adapted from “Meeting the challenge of disruptive change”, (Christensen & Overdorf, 2000)

Public entities, by their very nature, are less flexible when making structural changes. In view of this, just as in e-procurement efforts, the adoption, implementation and diffusion of a disruptive innovation within a public organization is more prone to non-compliance or failure, than the success and satisfaction of interested parties. This leaves few options for the public entity that must implement disruptive innovations: 1. Not do anything and ignore the imminent disruption (focus on normal operations), 2. Adopt the innovation but create a separate division or organization (Paap & Katz, 2004) (Christensen, et al., 2003) (Markides, 2006) (Sandberg, 2002) (Carayannis, et al., 2003).

The new organization in the case of advanced e-procurement, will be focused on operating the platform, consolidate the e-procurement service, promoting its adoption, provide training to buyers and sellers, maintain the technical and technological cutting edge in public procurement, developing new products and services on the basis of its technical and organizational interoperability abilities, build capacity for attracting and retaining a highly competitive human team, build customer service and marketing capacities, achieve economic sustainability and growth and developing and controlling new higher standards of service.

However, as in most disruptive innovations (see Figure 2), the main challenge of this organization, as catalyst for the success of the e-procurement implementation, would be manage the initial vacuum of knowledge of current and potential users (buyers, sellers and other strategic actors), produced by the abrupt technological change and the new set of rules of the model business.

The e-procurement as an Internet-based service should operate from an entity that centralizes the shared service, whose characteristics are more like those of an Application Service Provider for the public sector. Neither the Ministry nor other related bodies in the central government have incentives, processes, people and values to operate as an Application Service Provider.



**Figure 2. Types of Innovation and its Relation to Changes in Technology and Business Model**

Source: Taken and adapted from "Making Innovation Work", (Davila, et al., 2005)

These are not the usual abilities of governments and one should expect that those closer to this goal have been developed by independent public agencies or autonomous entities. Therefore, we looked for empirical evidence to see if practice was consistent with our claim.

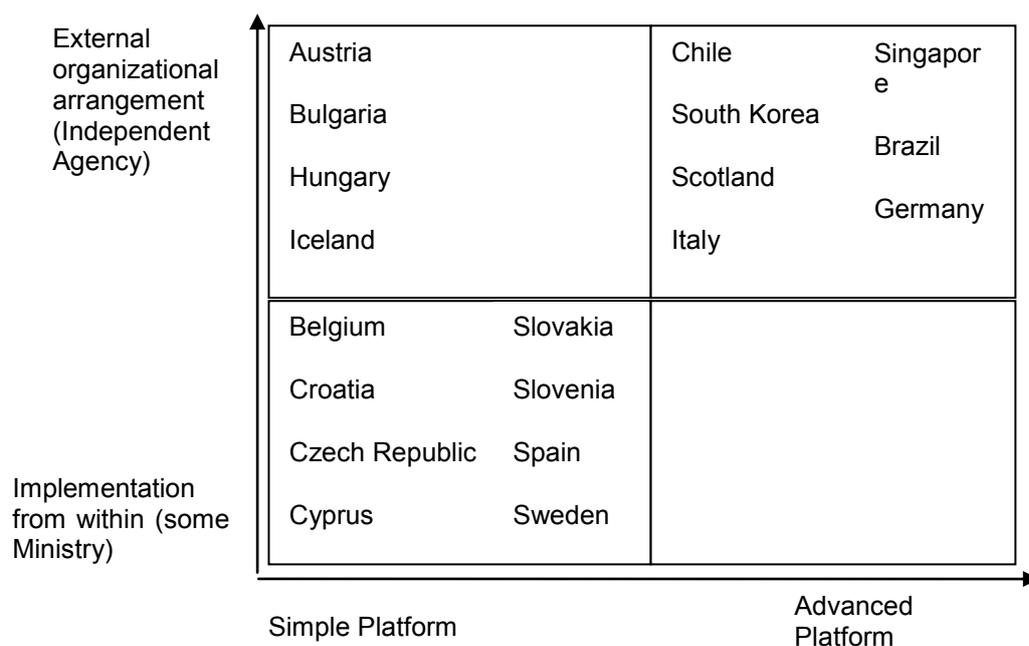
## 8 Results

Research was done on the empirical evidence available in the literature. We analyzed documentation and relevant pieces of evidence located on the Internet, related to 40 countries with nationwide e-procurement implementations. We classified the countries using two dimensions:

- Level of technical maturity of the platform according to the practices implemented (Moon, 2005); consequently, simple e-procurement practices consist of those systems that have some kind of Web-based information dissemination, electronic ordering and automated procurement systems. While advanced e-procurement practices consist of those platforms that permit suppliers to bid online and conduct reverse auctions, both considered as advanced and complex functionalities and in turn, for they operation, require a sort of sophisticated platform.
- Their organizational design: implementation conducted from the internal structure of the controlling institution (usually a Ministry of Treasury) or implementation conducted from a separate independent entity or agency (with important levels of autonomy).

Our results are organized in a Cartesian plane. The X-axis refers to the technical dimension and the Y-axis to the organizational dimension. See Figure 3.

The empirical observation supports our claim as it clearly shows that those nation-wide implementations in advanced stages are developed and managed by an agency with some levels of autonomy.



**Figure 3. Location of E-procurement Implementation efforts, by the Technical Maturity Level of the Technological Platform and by the Organizational Arrangement Used by the Entity or Agency in Charge**

Source: prepared based on (European Commission Internal Market Directorate-General, 2010) (IDB, 2008) (Lim, et al., 2008) (Shin & Sub Park, 2004) (Korea Information Technology Promotion Agency, 2007) (ESCAP, et al., 2006) (IPZS, 2004) (Commonwealth of Australia, 2005) (Bof & Previtali, 2010)

## 9 Discussion

Our research findings have important implications for public policy, public management, electronic government and the theory of disruptive innovations. Given its disruptive nature, national state-wide e-procurement should be done by an independent new agency with resources, processes, persons and values different from those of the incumbent procurement officers. This government agency will exploit the new technology and develop new clients for it. However, the new entity should keep a safe distance from the central governing authority, because too many connections to this body (usually represented by the Ministry of Treasury or Economy) will keep it immersed in its issues, values and processes. This will make learning difficult because culture, processes and systems of the central governing authority are designed for a business model that has already been proven and not for an experimental one. In this case, it is recommended that the governing authority and the new agency cooperate, but with a limited number of strategic connections (Govindarajan & Trimble, 2005).

This new entity, which would be an Application Service Provider (ASP) for the public sector, would represent a huge opportunity for e-procurement as disruptive innovation. The new entity will not only grow and strengthen the e-procurement, but also must develop new functions and associated services. It would enjoy the distance needed from the central authority, which would be its market, but it would also face challenges, like that of being completely independent from the “normal way of doing things” at other government bodies. For this reason the ASP should have as few employees as possible coming from other public entities at the beginning so that it can develop a different organizational culture and processes. The ASP should have governmental institutions as its clients and should provide them quality service. This entity should provide all necessary training to buyers, sellers and other relevant actors. The acceptance of e-procurement as a service, and the success of the ASP as enterprise, will depend on this friendly and quality service.

In a broader sense, new technologies that enable service oriented information architectures, centralized management of giant secure databases instantly accessible from any part of the world, ubiquitous access to the Internet, nearly universal access through mobile devices by citizens and companies of any size, and technical and semantic interoperability create the possibility of generating

disruptive innovations to produce not only better public services, but also new services or reach segments not adequately addressed to date or not addressed at all. In other words, our observations regarding the risks of not considering the disruptive character of national electronic public purchasing can be generalized for other government electronic initiatives.

Cognitively, these new tools for public management are very difficult for many leaders to assimilate. This is particularly true for those brought up during the 1980's under the influence of New Public Management theories based mainly on the idea of decentralization and competition between public agencies and between public agencies and the private sector as a mechanism to improve efficiency. A successful implementation of e-procurement may provide a demonstrative effect to facilitate the adoption of these new ideas.

At the highest level of decision making this results should help decision makers to decide on an organizational design that allows an independent agency to run e-procurement services based on the latest technologies that facilitate interoperability and horizontal integration, whose leaders and management are true innovators that are not only technologically savvy, but also have the managerial sophistication, culture and values to run it based on service level agreements.

On the other hand, it also provides a framework to understand the arguments of those opposing such organizational arrangement. It is not only a matter of losing power, if implemented in accordance with the ideas and evidence presented in this paper, they will not be part of the new organization. Critique and resistance will also come from other public officials who are familiar with a context of incremental innovation, where the idea of small steps and little internal confrontation prevails.

With regard to the theory of disruptive innovations, our work extends this concept to the public sector where few studies have been conducted and the topic of public purchasing is discussed for the first time in this study. Our findings suggest the validity of using this theory in the public procurement realm.

## 10 The Next Step

Continue this work in at least two directions. One possibility is to increase the number of initiatives studied to cover a larger number of countries. Another possible direction is to document a sufficient number of cases of national e-procurement with special emphasis on organizational and leadership aspects for a more detailed determination of the obstacles and advances derived from the organizational model selected.

## References

- Al-Moalla, A. & Li, D., 2010. Organisational Issues with Electronic Government Procurement: A Case Study of the UAE. *EJISDC*, 3(41), pp. 1-18.
- Barahona, J. C., Elizondo, A. M. & Jiménez, G., 2009. *Hacia un modelo de compras electrónicas costarricense*, CLACDS - STGD: s.n.
- Berry, R. S. & Berry, W., 1999. *Innovation and Diffusion Models in Policy Research*, s.l.: In P. Sabatier (Ed.), *Theories of the Policy Process* (pp. 169-200). Boulder, CO: Westview..
- Bof, F. & Previtali, P., 2010. National models of public (e)-procurement in Europe. *Journal of e-Government Studies and Best Practices*.
- Bower, J. & Christensen, C., 1995. Disruptive Technologies: Catching the Wave. *Harvard Business Review*.
- Carayannis, E. G., Gonzalez, E. & Wetter, J., 2003. The Nature and Dynamics of Discontinuous and Disruptive Innovations from a Learning and Knowledge Management Perspective. In: *The International Handbook on Innovation*. s.l.:Elsevier Science Ltd..
- Chan, J. K. Y. & Lee, M. K. O., 2003. SME E-Procurement Adoption in Hong Kong - The Roles of Power, Trust and Value. s.l., s.n.
- Charitou, C. D. & Markides, C. C., 2003. Responses to Disruptives Strategic Innovation. *MIT Sloan. Management Review.*, 44(2).
- Christensen, C. M., 1997. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, s.l.: Harvard Business School Press.
- Christensen, C. M., Johnson, M. W. & Rigby, D. K., 2002. Foundations for growth: how to identify and build disruptive new business. *MIT Sloan. Management Review*, 43(3).
- Christensen, C. M., Raynor, M. E. & Anthony, S. D., 2003. Six Keys to Building New Markets by Unleashing Disruptive Innovation. *Harvard Business Review*, March.
- Christensen, M. C. & Overdorf, M., 2000. *Meeting the challenge of disruptive change*, s.l.: Harvard Business Review.

- Commonwealth of Australia, 2005. Case Studies on E-procurement Implementations: Italy, New South Wales, New Zealand, Scotland, Western Australia, s.l.: Commonwealth of Australia.
- Coulthard, D. & Castleman, T., 2001. Electronic Procurement in Government: More Complicated Than Just Good Business. Bled, Slovenia, s.n., pp. 999-1009.
- Croom, S. & Brandon-Jones, A., 2009. Key Issues in E-Procurement: Procurement Implementation and Operation in the Public Sector. In: *International Book of Public Procurement*. s.l.:s.n.
- Davila, T., Epstein, M. & Shelton, R., 2005. Making Innovation Work: How to Manage It, Measure It, and Profit from It. s.l.:Wharton School Press.
- DeNardis, L., 2010. E-Governance Policies for Interoperability and Open Standards. *Policy & Internet*, 2(3).
- Dunleavy, P., Margetts, H., Bastow, S. & Tinkler, J., 2005. New public management is dead: long live digital era governance. *Public Policy & Services*, Volume N° 4.
- Engström, A., Wallström, Å. & Salehi-Sangari, E., 2009. *Implementation of Public e-Procurement in Swedish Government Entities*. s.l., s.n., p. 315 – 319.
- ESCAP, U. N., Service, P. P. & Bank, A. D., 2006. *E-Procurement*, s.l.: United Nations publication.
- European Commission Internal Market Directorate-General, 2010. Study on the evaluation of the Action Plan for the implementation of the legal framework for electronic procurement (Phase II): Country Profiles, Brussels: s.n.
- Fernández-i-Marín, X., 2011. The impact of e-government promotion in Europe: Internet dependence and critical mass. *Policy & Internet*, 3(4).
- Govindarajan, V. & Trimble, C., 2005. *10 Rules for Strategic Innovators: From Ideas to Execution*. Boston, Massachusetts: Harvard University Press.
- Govindarajan, V. & Trimble, C., 2010. *The other side of innovation: Solving the execution challenge*. s.l.:Harvard Business Review Press.
- Grant, G. & Chau, D., 2006. Developing a Generic Framework for e-G. In: *Advanced Topics in Global Information Management*. London: Idea Group, p. 393.
- Ha, H. & Coghill, K., 2006. E-Government in Singapore - A Swot and Pest Analysis. *Asia - Pacific Social Science Review*.
- Hyoung Lim, J., 2010. Digital Divides in Urban E-Government in South Korea: Exploring Differences in Municipalities' Use of the Internet for Environmental Governance. 2(3).
- IDB, 2008. *Evaluación del Sistema Nacional de Compras y Contrataciones Públicas*, Santiago de Chile: Banco Interamericano de Desarrollo, Gobierno de Chile.
- IPZS, 2004. *Public Procurement in Europe*, s.l.: Presidenza del Consiglio dei Ministri - Secretariato Generale - Dipartimento per le Risorse Umane e Strumentali.
- Kishor, V., Guy, C. & Sajeev, 2006. Critical factors that influence e-procurement implementation success in the public sector. 6(1 & 3), pp. 70-99.
- Korea Information Technology Promotion Agency, 2007. *Korea's e-Government - Best Practice*. Seoul, South Korea, s.n., p. 18.
- KSCeG, 2003. Korea's e-government. Completion of e-Government Framework, Korea: s.n.
- Lam, A., 2005. Organizational Innovation. En: J. Fagerberg, D. C. Mowery & R. R. Nelson, edits. *The Oxford Handbook of Innovation*. s.l.:Oxford University Press.
- Lim, G. G., Kim, R. B. & Lee, H. B., 2008. Public e-procurement: The Korean On-Line E-Procurement System (KONEPS). s.l., s.n.
- Lindblom, C., 1959. The Science of "Muddling Through.". *PublicAdministration Review*, Volume 29 (1), pp. 79-88.
- Margetts, H. Z., 2009. The Internet and Public Policy. *Policy & Internet*, 1(1).
- Markides, C., 2006. Disruptive Innovation: In Need of Better Theory. *The Journal of Product Management Innovation*, Volume 23, pp. 19 - 25.
- Mintzberg, H., 1979. *The Structuring of Organization*. s.l.:Prentice Hall.
- Moon, M. J., 2005. E-procurement management in state governments: diffusion of e-procurement practices and its determinants. *Journal of Public Procurement*, 5(1), pp. 54-72.
- OCDE, 2007. Integrity in Public Procurement. GOOD PRACTICE FROM A TO Z., s.l.: THE OCDE Publishing.
- OECD, 2003. *The e-Government imperative*, s.l.: OECD Publications Service.
- OECD, 2004. *E-Government in Finland*, s.l.: OECD Publishing.
- OECD, 2005. Oslo Manual: Guidelines for collecting and interpreting innovation data. Third Edition ed. s.l.:OECD and EUROSTAT.
- Paap, J. & Katz, R., 2004. Predicting the "Unpredictable": Anticipating Disruptive Innovation. *Research - Technology Management*.
- Panayiotou, N. A., Gayialis, S. & Tatsiopoulou, 2004. An EProcurement System for Governmental Purchasing. *International Journal For Production Economics*, Volume (90:1), pp. 79-102.
- Panda, P., Sahu, G. & Gupta, P., 2010. Promoting Transparency and Efficiency in Public Procurement: E-Procurement Initiatives by Government of India.. Bangalore, India, Indian Institute of Management Bangalore.
- Pires, G. D. & Stanton, J., 2005. A Research Framework for the Electronic Procurement Adoption Process: Drawing form Australian Evidence. *Journal of Global Business and Technology*, 1(2).
- Rahim, M. M., 2008. Identifying Factors Affecting Acceptance of E-procurement Systems: An Initial Qualitative Study at an Australian City Council. *Communications of the IBIMA*, Volume 3.
- Rajkumar, T. M., 2001. E-Procurement: Business and Technical Issues. *Information Systems Management*, Volume (18:4), pp. 52-62.

- Rasheed, H., 2004. Capital Access Barriers to Public Procurement Performance: The Moderating Effects of Ethnicity, Gender and Education. *Journal of Developmental Entrepreneurship*, Volume 9 (2), pp. 22-43.
- Reddick, C. G., 2004. The Growth of E-Procurement in American State Governments: A Model and Empirical Evidence. *Journal of Public Procurement*, 4(2), pp. 151-176.
- Rogers, E., 1995. *Diffusion of Innovations*. 4th ed. New York: The Free Press.
- Sandberg, B., 2002. Creating the market for disruptive innovation: Market proactiveness at the launch stage. *Journal of Targeting, Measurement and Analysis for Marketing*, September, 11(2), pp. 184-196.
- Shin, G.-C. & Sub Park, M., 2004. Learning from the Award-Winning Korean Public Procurement Service. s.l., s.n.
- Slater, S. F. & Mohr, J. J., 2006. Successful Development and Commercialization of Technological Innovation: Insights Based on Strategy Type. *The Journal of Product Innovation Management*, January.23(1).
- Somasundaram, R. & Damsgaard, J., 2005. Policy recommendations for electronic public procurement. *The Electronic Journal of e-Government*, Volume 3(3), pp. 147-156.
- Suk Kim, P., 2007. Emerging challenges to the public capacity in the era of evolving public administration: toward collaborative public management. *Asian Journal of Political Science*.
- Teo, T. S., Lin, S. & Lai, K.-h., 2009. Adopters and non-adopters of e-procurement in Singapore: An empirical study. *Omega*, Volume 37, pp. 972-987.
- Tether, I., 1977. *Government Procurement and Operations*, Cambridge, MA: Ballinger Publishing Company.
- Thai, K., 2001. Public Procurement Re-examined. *Journal of Public Procurement*, Volume 1 (1), pp. 9-50.
- Thomond, P., Herzberg, T. & Lettice, F., 2003. *Disruptive Innovation: Removing the Innovators' Dilemma*. s.l., s.n.
- Trott, P., 2011. *Innovation Management and New Product Development*. 4th Edition ed. s.l.:Prentice Hall.
- UN ESCAP, 2006. *E-Procurement*, s.l.: United Nations publication.
- United Nations, 2011. Transparency and public procurement. Supplement to the 2011 Annual Statistical Report on United Nations Procurement, s.l.: Report on United Nations Procurement..
- Vaidya, K., Callender, G. C. & Sajeev, A., 2009. Facilitators of Public E-Procurement: Lessons learned from the U.K., U.S., and Australian Initiatives. In: *International Handbook of Public Procurement*. s.l.:s.n.
- Wittig, W. A., 2003. *Public Procurement and the Development Agenda*, Geneva, Switzerland: International Trade Centre.