JOURNAL OF PUBLIC PROCUREMENT, VOLUME 13, ISSUE 3, 337-363 FALL 2013

PUBLIC POLICY AND FINANCIAL MANAGEMENT THROUGH E-PROCUREMENT: A PRACTICE ORIENTED NORMATIVE MODEL FOR MAXIMIZING TRANSFORMATIVE IMPACTS

Alexandru V. Roman*

ABSTRACT. Scholars have suggested that the current dynamics within the provision of public services have shaped traditional administration into governance by contract. Under such conditions, restructuring public procurement, specifically within the technological capabilities available within e-procurement, has often been associated with manifold positive financial and policy outcomes. The supposed benefits of digitalizing public procurement are legion, yet they are often assumed and rarely grounded in hard evidence. Based on the results of a survey of procurement specialists (n=499), this article suggests that in its current form e-procurement adoption is failing to uphold the transformative benefits that it is regularly attributed within popular discourse. An extensive literature review is undertaken in order to construct practical understandings of the factors that could explain the rather disappointing early developments. The paper offers a practice oriented normative model that would increase the probability of achieving transformative dynamics as a result of e-procurement adoption.

INTRODUCTION

The austere budgetary and economic conditions of the last decade juxtaposed with the transformation of governance (Kettl, 2002, 2005) have fueled a search for innovative and cost saving management and policy approaches. Globally, governments at all levels have started to pay increased attention to public procurement

---

* *Alexandru V. Roman, Ph.D., is an Assistant Professor, Department of Public Administration, California State University San Bernardino. His research interests include public management, leadership, public procurement, ethics and public corruption.*

as an area of previously untapped strategic benefits. Within the context of technological advancements, digitalizing the public procurement process appears, at least in theory, to offer manifold opportunities for administrative efficiencies and improved policy outcomes.

E-procurement[1] can be understood as the digitalization of important aspects of the purchasing process, such as search, selection, communication, bidding or awarding of contracts (Barua et al., 2001; Sun et al., 2012); with a specific emphasis on efficiency, transparency and policy in the public sector (Carayannis & Popescu, 2005; Walker & Brammer, 2012). The adoption of e-procurement platforms is habitually expected to provide the framework for improved administrative efficiency, higher levels of transparency, accountability, sustainability and competition (see Bof & Previtali, 2007; Croom, 2000; Croom & Johnston, 2003; deBoer et al., 2002; Hardy & Williams, 2008; Henriksen & Mahnke, 2005; Leukel & Maniatopoulos, 2005; Mishra et al., 2007; Mota & Filho, 2011; Varney, 2011; Walker & Brammer, 2012; Zsidisin & Ellram, 2001). Furthermore, it is often anticipated that e-procurement platforms, as part of e-government initiatives, would become a critical aspect of policy implementation, management and monitoring (Bof & Previtali, 2007). Although social and policy outcomes have been targeted through public procurement throughout history (McCrudden 2004), this requirement has become even more prevalent since the advent of e-procurement.

Whilst governments have dedicated great resources to digitalize public procurement (Mota & Filho 2011; Somasundaram & Damsgaard, 2005) the outcomes have been rather mixed. Some initiatives achieved desired goals, while most have failed to improve the conditions they were intended to address. In many cases, e-procurement initiatives resulted in great financial waste (Somasundaram & Damsgaard, 2005), decreased quality of services (Hoque, Kirkpatrick, Londsdale, & de Ruyter, 2011) or have made social and policy impacts an afterthought during implementation (Bof & Previtali, 2007; Peck & Cabras, 2011). Holistically, it can be argued that the areas associated with highest expectations that of public e-procurement as a strategic management tool and as a policy mechanism – might have been thus far the two most disappointing dimensions of the efforts to digitalize public procurement (Andersen,

2004; Bof & Previtali, 2007; McCue & Roman, 2012). The anticipation that the adoption of e-procurement will lead to transformative impacts, that is that it will meaningfully change the nature of the procurement process, in terms of becoming an important social policy and financial management tool, appears currently particularly hollow when examined within the context of everyday practices. Is, then, the transformative[2] impact of e-procurement just a "wishful thinking" exercise?

This article uses data obtained from a survey of procurement specialists to suggest that e-procurement platforms have yet to yield expected transformative benefits. An extensive literature review is employed in order to construct an understanding of the possible grounds behind the difficulties in achieving anticipated transformation. The paper provides a practice oriented, normative e-procurement adoption construct that could potentially maximize the transformative benefits of public digital procurement. It is argued that in order for e-procurement to become an important aspect of modern network-based governance, its implementation cannot be approached in a localized manner. The mere adoption of e-procurement infrastructures will not automatically lead to improved financial or policy outcomes. E-procurement platforms, like the majority of the technological developments in governance of the past two decades, are rarely deterministic by nature.

The discussion in this article is constructed around three major sections. The first section uses original survey data to frame the argument that e-procurement has yet to achieve significant transformative impacts. The findings are used to lend support to the idea that e-procurement implementation indeed faces critical challenges, which are often overlooked. The second section traces, as identified through an extensive literature review, the main barriers that need to be addressed in order for e-procurement to motivate notable management and policy effects. The final section of the paper introduces a conceptual normative construct for addressing the design, implementation and evaluation of digital procurement structures.

CURRENT STATUS OF E-PROCUREMENT ADOPTION

Much has been made of the potential of information communication technologies (ICTs) to reinvent and improve the

performance of governance (Brainard & McNutt, 2010; Fountain, 2001; Kettl, 2002, 2005; West, 2005). The use of ICTs within public procurement is regularly identified as a critical dimension in the ultimate success of e-government (Moon, 2003; Thomson 2009). Although it might premature to conclusively evaluate the broad impacts of e-government initiatives, hitherto, the results have been less than impressive. Dunleavy, Margetts, Bastow and Tinkler (2006) and Dalcher and Genus (2003) assert that failure is a regular characteristic for ICT adoptions; in the long run the costs of IT projects often outweigh their benefits (Norris & Moon, 2005). Scholars agree that while it is not yet clear whether ICTs have made governments more efficient, technology has certainly failed thus far to make governance more democratic (see Brainard & McNutt, 2008; Coursey & Norris, 2008; Edmiston, 2003; Koh, Prybutok & Zhang, 2008; Moon, 2002; Romzek & Johnston, 2005; "A Special Report," 2008; The Pew Center on the States, 2008; West, 2005).

The digitalization of public procurement fits within a similar expectation pattern. E-procurement initiatives have made an impact on agencies at the functional level, but have been fairly unsuccessful in imposing as a consistent financial management tool or as an effective policy mechanism (Bof & Previtali, 2007; Mota & Filho, 2011; Somasundaram & Damsgaard, 2005; Varney, 2011). Scholars have noted that e-procurement initiatives, often associated with the highest potential for cost-savings, have regularly underperformed in these terms; on many occasions the adoption of e-procurement led to inefficiencies, increased administrative costs, which in some cases have even motivated their termination (Pavlichev & Garson, 2004; Thomson, 2009), The argument could be made that this point in time e-procurement has been assimilated by extant organizational constructs, hence enforcing traditional administrative structures (Hawking et al., 2004), rather than motivating transformation in public procurement.

In order to evaluate the current condition of e-procurement adoption in North America, 2,269 American and Canadian members of the National Institute of Governmental Purchasing (NIGP) were invited to complete a 30 item survey (Appendix A). NIGP is a professional association with over 15,000 members from United States and Canada. Before the administration of the survey the questionnaire underwent several rounds of review from procurement

specialists, who revised the questions in terms of their construction and pertinence to practice. The holistic scope of the survey was to identify the current status of e-procurement enactment and use. The development and design of the survey was driven by a "practitioner's perspective" and did not target any specific theoretical questions.

The survey instrument was intended to address five principal vectors: (1) the overall status of e-procurement implementation, (2) the integration of e-procurement software with other platforms in use, (3) the levels of e-procurement usage, (4) the degree of user satisfaction and (5) strategic impacts of e-procurement adoption. When found appropriate, respondents were offered the space to voice their opinion within the frame of open-ended questions. The latter added a qualitative aspect to the collected data, which provided additional rich insights that helped generate more thorough understandings of the respondents' structures of reference. The qualitative dimension also provided the possibility of uncovering dynamics that otherwise might have been missed by the questionnaire. The survey was administered online using Survey Monkey from June 2 to June 27, 2011. The response rate was 22% (499) with the majority of responses (480) coming from American specialists.

There are several important limitations within the research design and data that should be addressed here. First, the survey was not framed with the purpose of addressing a specific theoretical question, but rather to provide a generalizable evaluation of the status of e-procurement. Any theory related conclusions should be interpreted under a customary level of academic caution and should probably be viewed as suggestions rather than testable hypotheses. Second, although the sample captures important levels of organizational and institutional diversity, it is not sufficiently rich to provide the grounds for exacting conclusions regarding the entire procurement universe. Taken together, the data provides an approximate perception-based evaluation across manifold institutional environments. Third, the majority of respondents in the sample are American professionals. Finally, the constraints of the research design made testing for non-response bias impossible. Yet, despite these possibly critical limitations - the size of the sample, the response rate and the consistency in response patterns offer sufficient reasons to suggest the reliability and representativeness of the data. In this sense, the

nature of the research is in large part descriptive and exploratory, and the resulting conclusions should be treated as such.

DESCRIPTIVE STATISTICS

A total of 55% of those who responded have indicated that their agencies were using digital procurement platforms. However, even in the cases when e-procurement was adopted strategic dimensions such as performance or risk management, contract management and collaboration tools were used by 35% or less of those responding. Those who reported the use of strategically-oriented tools also reported relatively high levels of dissatisfaction (Table 1). When adjusting for the percentage of cases when the feature was not used,

TABLE 1
Levels of Satisfaction with e-Procurement (by Function)

	Very Dis-satisfied	Dis-satisfied	Satisfied	Very Satisfied	Feature Not Used	Total # of Responses
Requisitioning (incl. catalog services / shopping cart)	8%	10%	44%	25%	13%	174
Central contract repository	8%	7%	30%	16%	40%	168
Online supplier registration	7%	6%	30%	22%	36%	166
Notifications	7%	5%	22%	24%	43%	166
Contract life-cycle management suite	**7%**	**3%**	**17%**	**6%**	**67%**	**164**
Collaboration tools	**6%**	**4%**	**12%**	**5%**	**74%**	**159**
Spend analytics	6%	10%	24%	7%	54%	163
eSourcing	6%	5%	17%	11%	61%	163
Supplier performance and risk management tools	**6%**	**4%**	**13%**	**4%**	**73%**	**165**
Procurement marketplace (including catalog services)	5%	5%	17%	10%	64%	164
Reverse auctions	**5%**	**3%**	**8%**	**6%**	**79%**	**155**
Forward auctions	**4%**	**2%**	**9%**	**9%**	**76%**	**160**
eInvoicing	4%	3%	14%	5%	74%	162

30% of those using contract life-cycle manage suite, 38% of those using collaboration tools, 37% of those using supplier performance and risk management tools, 33% of those using reverse actions and 25% of forward auctions users claimed that they were either very dissatisfied or dissatisfied with the specific procurement function.

Additionally, procurement specialists reported low usage and integration levels among procurement and financial platforms. Across all e-procurement capabilities on average only 27% of respondents reported full or partial integration between e-procurement platforms and financial platforms; full integration was noted by more than 20% of respondents only along four functions: analytics, supplier registration, contract repository and requisitioning (Table 2).

Limiting the conclusion to the sample in case, the average length of e-procurement usage, that is the number of years that the respondents indicated using a specific digital procurement platform, was not found to be statistically different for varying levels of

TABLE 2
Level of Integration (by Function)

	Full	Partial	Not Integrated	N/A	Total # of Responses
Reverse auctions	4%	1%	25%	70%	171
Forward auctions	4%	2%	28%	66%	169
Collaboration tools	6%	4%	25%	66%	167
Supplier performance and risk management tools	9%	5%	27%	60%	172
Contract life-cycle management suite	11%	6%	23%	60%	170
eSourcing	14%	5%	31%	51%	170
eInvoicing	15%	5%	20%	59%	167
Procurement marketplace (including catalog services)	17%	6%	25%	53%	171
Notifications	18%	8%	38%	37%	173
Spend analytics	21%	12%	24%	43%	171
Online supplier registration	21%	6%	42%	30%	173
Central contract repository	26%	11%	30%	34%	170
Requisitioning (incl. catalog services / shopping cart)	68%	9%	12%	11%	181

integration or satisfaction. Regardless of the historical experience of the agency with digital procurement, that is the number of years that a certain e-procurement platform was in place, respondents were just as likely to report satisfaction or dissatisfaction and integration or non-integration, respectively. There were no statistical significant differences in average operating expenditures among agencies that reported partial or full integration and those reporting no integration between procurement and financial platforms. Smaller agencies as well late adopters were just as likely as larger agencies and early adopters, respectively, to integrate their digital procurement platforms with the broader financial infrastructures.

Within this context there are several suggestions that can be made. First, there are limited grounds to believe that e-procurement implementation has motivated transformational changes at the organizational or policy levels. Second, currently e-procurement platforms are rarely integrated within the larger scope of financial systems. Third, the collaborative and strategic features of e-procurement platforms exhibit low rates of usage. Fourth, in cases when e-procurement has been adopted, specialists report relatively high levels of dissatisfaction. Finally, the digitalization of public procurement might have simply enforced extant constructs and has yet to support expected financial discipline or policy level involvement (McCue & Roman 2012).

The main goal sought by the introduction the survey results is to suggest that e-procurement infrastructures have indeed failed to deliver along the dimensions that were expected to benefit the most from the adoption of digitalized infrastructures. In essence, if nothing else, the survey lends support to the argument that e-procurement implementation is facing important challenges. While the results are intriguing on their own, they are not central to the focus of this paper.[3] The findings have motivated a search for the identification of possible motivators behind the extant condition. The paper now turns to the discussion of the possible explanations and reasons why e-procurement adoption has failed to inspire transformational changes.

TRACING CHALLENGES IN ACHIEVING TRANSFORMATION

Scholars have long pointed out that in governance by contract within the hollow state (see Cooper, 2003; Kettl, 2002; Milward & Provan, 2000; Savas, 2000; Sclar, 2000; van Slyke, 2007) public

procurement, in particular contract management, will play a significant role. E-procurement, specifically, has been associated with a great deal of administrative, policy and transformative benefits and outcomes (Carayannis & Popescu, 2005). Yet, as argued in the previous section, at the moment it is problematic to claim that e-procurement can uphold the expectation of being a strategically significant policy and financial governance tool.

In order to develop an understanding of the reasons explaining the current condition an in depth review of extant academic literature was undertaken. The results of the analysis did not reveal one primary or simple motive behind the limited transformative impacts of e-procurement. Whilst, many of the challenges faced by governments in their efforts to digitalize procurement, are common to all ICT adoptions, there are also some barriers that appear to be somewhat specific to public procurement. Table 3 offers a summary breakdown of the direct difficulties in maximizing transformative benefits of e-procurement as identified through the examination of current literature.

It should be noted that the breakdown along the dimensions offered in Table 3 is not the only reasonable or conceivable

TABLE 3
Challenges/Barriers in Achieving Transformation[4] through e-Procurement[5]

Challenges type	Description	Partial or full discussions provided by
Fragmented understanding of technological dynamics, implementation and spotty legislative support	E-procurement means different things to different stakeholders. Systems are implemented in a localized manner. There is limited organizational or national integration or legislative coordination.	MacManus (2002), Moon (2003), Hawking et a.l (2004), Andersen (2004), Panayiotou et al., (2004), Gansler & Luby (2004), Leukel & Maniatopoulos (2005), Croom & Brandon-Jones (2005), Gichoya (2005), Carayannis & Popescu (2005), Henriksen & Mahnke (2005), Vaidya et al. (2006), Preus (2007), Hardy & Williams (2008), Bof & Previtali (2007), Lee (2010), Eadie et al. (2010), Varney (2011), Mota & Filho (2011), Hui et al. (2011), Hoque et al. (2011), McCue & Roman (2012)

TABLE 3 (Continued)

Challenges type	Description	Partial or full discussions provided by
Technology's supposed "halo" effect, lack of technological "know how," financial constraints and waste	The expectation that it is sufficient to implement the technology and the benefits "will come." Implementing e-procurement without providing the supportive context is unlikely to lead to desired outcomes. Limited understanding of technological effects coupled with lack of experience in the matter can cause great financial waste and strategic disappointments.	Kheng & Al-Hawandeh (2002), Moon (2003), Andersen (2004), Hawking et. al (2004), Carayannis & Popescu (2005), Gichoya (2005), Henriksen & Mahnke (2005), Moon (2005), Vaidya et al. (2006), Bof & Previtali (2007), Hardy & Williams (2008), Gunasekaran & Ngai (2008), Thomson (2009), Eadie et al. (2010),Varney (2011), Mota & Filho (2011), Hoque et al. (2011)
Incompatibility of platforms or managerial and philosophical strategies	E-procurement systems are often incompatible with other digital platforms used by organizations or with traditional procurement practices.	Croom (2000), Moon (2003), Daly & Buehner (2003), Andersen (2004), Gansler & Luby (2004), Carayannis & Popescu (2005), Leukel & Maniatopoulos (2005), Croom & Brandon-Jones (2005), Vaidya et al. (2006), Gichoya (2005), Gunasekaran & Ngai (2008), Thomson (2009), Eadie et al. (2010), Varney (2011), Karjalainen & van Raaij (2011), Hoque et al. (2011), McCue & Roman (2012)

TABLE 3 (Continued)

Challenges type	Description	Partial or full discussions provided by
Interrupted (punctuated) implementation: Or the need for maintaining dedication and learning beyond first stage adoption	As it is the case with the majority of ICT use in government, e-procurement adoption is undertaken in spurts. At this point in time, there is an obvious shortcoming in continuous support and dedication to the idea. Early failures stymie future investments or transformational changes.	Andersen (2004), Vaidya et al. (2006), Eadie et al. (2010), Varney (2011), Mota & Filho (2011), McCue & Roman (2012)
Internal customer satisfaction and maverick purchasing	If the e-procurement software is found to be inadequate for organizational needs and not representative of the decisionmaking dynamics within the agency - procurement specialists will "go around" the system. Thus, any potential transformational benefit from e-procurement adoption will be lost since the system's use becomes rather trivial.	Davila et al. (2003), Croom & Johnston (2003), Moon (2003), Daly & Buehner (2003), Gansler & Luby (2004), Carayannis & Popescu (2005), Vaidya et al. (2006), Bouwman et al. (2007), Angeles & Nath (2007), Gunasekaran & Ngai (2008), Brandon-Jones & Carey (2010), Eadie et al. (2010), Aboelmaged (2010), Mota & Filho (2011), Varney (2011), Diggs & Roman (2012), McCue & Roman (2012), Karjalainen & van Raaij (2011)

TABLE 3 (Continued)

Challenges type	Description	Partial or full discussions provided by
Resistance to technology and cooptation	Organizations often resist the changes associated with e-procurement adoption. Without a proper approach and managerial support the system will be resisted and sabotaged or co-opted within existing power constructs.	Yen & Ng (2002), Davila et al. (2003), Croom & Johnston (2003), Hawking et. al (2004), Gansler & Luby (2004), Carayannis & Popescu (2005), Vaidya et al. (2006), Angeles & Nath (2007), Gunasekaran & Ngai (2008), Thomson (2009), Eadie et al. (2010), Brandon-Jones & Carey (2011), Mota & Filho (2011), Hoque et al. (2011)
Complexity, uncertainty, ambiguity and network-driven contractual instability	Public procurement is probably one of the most complex areas of public administration. Within the context of increasing reliance on contracts and networks, matters become even more complicated. The governance complexity and instability make effective e-procurement (transformative procurement in general) challenging and at times even technologically prohibitive.	Croom (2000), Mitchell (2000), MacManus (2002), Moon (2003), Andersen (2004), Gansler & Luby (2004), Leukel & Maniatopoulos (2005), Enquist, Johson & Camén (2005), Henriksen & Mahnke (2005), Enquist et al. (2011), Brown, Potoski & van Slyke (2006, 2007, 2009), Thomson (2009), Eadie et al. (2010), Varney (2011), Camén & Johnson (2011), Diggs & Roman (2012), Entwistle (2011), Peck & Cabras (2011), Hoque et al. (2011)

TABLE 3 (Continued)

Challenges type	Description	Partial or full discussions provided by
Biased data or "dead end" data collection	Either due to financial and knowledge constraints, strategic focus or organizational and legislative designs - the data and insights garnered by employing e-procurement are not used. When such data are considered, it is often the case that it's done in a biased manner.	Andersen (2004),Gichoya (2005), Angeles & Nath (2007), Hardy & Williams (2008), Thomson (2009)
Software developers are not "public" ready, oriented or reasonably priced	The platforms available on the market are either primarily oriented for the private sector or are not sufficiently sophisticated to address the complexity and network-driven needs of a public entity. Public procurement specialists are not active participants in the design of the procurement software.	Davila et al. (2003), Andersen (2004), Hawking et. al (2004), Carayannis & Popescu (2005), Leukel & Maniatopoulos (2005),Bof & Previtali (2007), Angeles & Nath (2007), Gunasekaran & Ngai (2008), Thomson (2009), Eadie et al. (2010), Varney (2011), McCue & Roman (2012)

perspective. The literature on e-procurement offers a rich choice of discussions about the challenges faced in e-procurement implementation. Hawking et al. (2004) and Bof and Previtali (2007),

for instance, provide two wonderful frames/classifications of barriers faced in e-procurement implementation. The approach taken in this article differs from other existing works in that it focuses on public procurement and specifically targets barriers in achieving transformative and policy impacts.

MAXIMIZING TRANSFORMATIVE BENEFITS: A PRACTICE ORIENTED NORMATIVE MODEL

Based on the discussion on obstacles in e-procurement adoption, it becomes readily apparent that there is no one dominant or unique challenge. On the whole, certain barriers in the achievement of transformative outcomes are specific to the use of technology for provision of public service, whereas others are more specific to digital procurement (Andersen, 2004). While the individual level challenges appear to be leading in terms of significance, institutional and legislative contexts are not far behind. Together, the dimensions delineated in Table 3 could provide an appropriate explanation frame for the habitual failures on the part of e-procurement initiatives to transfer democratic needs, professional expectations and legislative norms into practice through process designs and resulting decisionmaking.

It is highly doubtful that attending to one challenge at a time could lead to desired outcomes. The complexity of public purchasing and the monitoring of contractual relationships would render ineffective any reform initiative that is anything less than a strategically coordinated effort at the national level. Although, it is difficult to argue for one best way of guaranteeing transformative impacts within e-procurement constructs; there are several dimensions that ideally should be addressed simultaneously.

First, it is crucial to develop the incentive and legislative framework for supporting the development of a software market specifically focused on the demands of public sector procurement. The survey results and the review of the literature confirm that many of the shortcomings of e-procurement platforms can be traced in large part to the lack of choices, knowledge and communication when politically-driven implementation decisions are made.

Second, notwithstanding the rhetorical implications of “governments that work better,” e-procurement will not become an

effective policy and financial tool without adequate training of procurement specialists. There is little "halo" about technology. Its transformative effects will go only as far as its users and the supporting institutional structures will allow it to go. This could provide a valid explanation for the minimal levels of usage of strategic functions and for low levels of satisfaction. In epistemological sense, public servants have to realign their learning habits and interpretation perspectives to fit the capacities offered by technological constructs.

Third, scale matters. The nature of public procurement minimizes the probability of e-procurement motivating transformative changes if procurement is digitalized only in a localized manner and it is used on limited or on discretionary bases. Considering that technology can be seen both as a product and an enforcer of extant human constructs (Orlikowiski 1992, 2000; Mota & Filho, 2011), it could be argued that the probability of achieving transformative impacts exhibits a direct relation with the scale of the implementation and acceptance. A more encompassing adoption effort will be associated with a higher probability of transformative impacts.

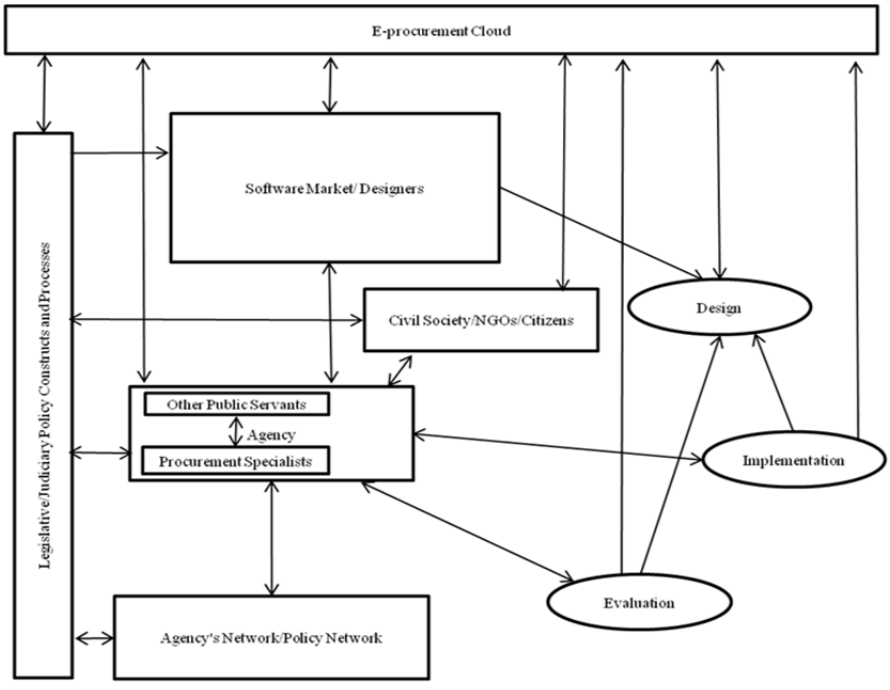
Fourth, notable financial investments are necessary in order to maximize the benefits of e-procurement. Transformation is not cheap. The capability to generate instant data and to automate large scale comparisons for purposes of decisionmaking were some of the primary reasons behind the early hype of digital procurement. If such data goes unused or is misunderstood, there is a higher probability of e-procurement becoming another underperforming, costly and ineffective governmental project.

Finally, and perhaps most importantly, e-procurement adoption needs to be constructed on a flexible circular-driven learning process within a cloud-type framework.[6] Although it might come across as bland, all stakeholders need to have an "access point" within the process, even if such privilege is rarely exercised. Figure 1 provides a visual of the normative model that addresses the lack of transformative effects on the part of e-procurement platforms. The graphic delineates the main categories of stakeholders and their normative interactions during the design and implementation processes. Here, it is imperative to note that while the learning process is circular, it "starts" with the procurement specialists and the public agency. Other stakeholders, for instance, vendors, nongovernmental organizations, citizens and legislators, although

active should not represent the chief drivers during design and implementation of e-procurement. The parameters for the software design should flow from practitioners to designers. Thus, in a normative sense, in order to achieve transformative impacts, e-procurement platforms have to adapt to the needs and realities of practice, rather than the other way around.

In the graph, the one-directional arrows represent one-way communication and learning processes and the double-headed connections stand for a two-way continuous communication and learning dynamics, respectively. Rectangle shapes are used to focus institutional structures, whereas the oval shapes emphasize functions.[7] The schematic in Figure 1 is not the only possible visualization and its primary goals are to emphasize the circularity and complexity of a benefit maximizing mechanism; the "right" and

FIGURE 1
Practice Oriented Normative Model for e-Public Procurement Adoption



need for all stakeholders to become involved in the process; and that the "excellence" of e-procurement infrastructures should be evaluated on terms and criteria imposed by practice and not by information systems developers.

CONCLUSION

This paper started with the argument that e-procurement implementation has achieved few, if any, broad scale transformations that are habitually associated with its adoption within realm of public administration. The survey results and recent academic literature reflect that, regardless of organizational context or governmental level, digitalized public procurement might currently have limited policy impacts and is far from the financial management mechanism that it was hoped to become. In simple terms, this paper represents a mapping exercise of the challenges that need to be managed in order to achieve desired transformations. The suggested normative model should be used as a starting point. Were one to use the model as anything more than normative guidance one would soon find that it becomes overwhelming. The model does not and cannot solve the issues faced by e-procurement; nevertheless, it does provide a conceptual map.

Despite the fact that there is only limited evidence that e-procurement has motivated transformative-type changes, this does not mean that the early expectations were constructed on an unrealistic framework or that they should be abandoned. Prolonged and sustained investments are often necessary for desired technology-induced changes to become reality (Andersen, 2004; Fountain, 2001; West, 2005). The literature review suggests that the dynamics of e-procurement challenges are too complex to respond to one-dimensional or localized-type solutions. There is a high probability that within inappropriate implementation constructs, the introduction of e-procurement might come with low benefits to cost ratios. Adoption of technology does not guarantee results and implementing technology for the sake of implementation increases the probability of failure and panoply of other adverse impacts. Overall, the argument can be made that public servants, through their decisions regarding the usage of a specific system, are an important part in whether e-procurement adoption yields the desired benefits. In a sense, without a "change in the mindset" on the part of administrators technology in

public sector will be co-opted and will enforce existing administrative habits and power structures.

En ensemble, then, the findings and the discussion presented in this article indicate that the lack of transformative impacts might be a common denominator for e-procurement platforms. As it is often the case with public sector initiatives, there is a trade-off between adopting e-procurement to specific organizational needs and achieving broader policy effects. Under current budgetary conditions balancing competing demands and achieving scale policy coordination through e-procurement, while maintaining local flexibility, becomes a critical, sometimes perhaps impossible, demand of governance. This discussion intended to delineate the main barriers towards achieving transformational impacts and to suggest a conceptualization of a redressing construct. Future research should examine the viability of the suggested approach. Furthermore, it might still be early to conclusively evaluate the impact of e-procurement; indeed as MacManus (2002) and Davila et al. (2003) suggest, e-procurement infrastructures diffuse more slowly than it is often portrayed in political rhetoric. While the initial results might not be as positive as expected, the extant body of scholarly work reflects that issues of digitalized public procurement have been indeed clearly delineated and are sufficiently well understood. What "remains," then, is for these lessons to be applied in practice. Within this context, maximizing the policy and financial impacts of public procurement becomes a matter of coordinating scale integration, minimizing friction across challenges and involving public servants.

NOTES

1. For the purpose of this article, e-procurement, digital procurement, digital procurement platforms are used interchangeably. There surely are subtle semantic, logical and technical differences among the various concepts; yet, it is believed that these differences are not critical for the scope of this discussion. E-procurement is arguably the "broadest" term among the three. When referring to e-procurement, outside the digital system, one would also capture the supporting procurement processes (e.g. contract writing systems, contract databases, contractor registries, communication mechanisms,

etc.). Here, e-procurement is used primarily in its more limited sense that is that of electronic procurement system, employed for meeting the procurement needs of an organization.

2. For the purposes of this article, transformation is understood in the manner that it is defined by the 2013 Oxford online dictionary as a "marked change in form, nature or appearance." The emphasis is placed on marked changes in public procurement practice in terms of financial management and public policy roles as a result of technology-induced shifts. It is also assumed that while there are significant levels of overlap, there are also critical differences between procurement in the public sector and private sector (see Arrowsmith & Davies, 1998; Thai 2009).
3. For a detailed discussion of the survey results see McCue and Roman (2012).
4. A strong case can be made that privacy and security concerns are important barriers in the adoption of e-procurement. Yet, such challenges were found to be largely pertinent to instrumental and not transformational dimensions.
5. Public e-procurement is not necessarily the main focus of several of the studies that are included here. Even in the case when the researches dealt solely with the private sector the works were included if the lessons were believed to be along the lines of the theme sought by the review and the findings were transferable to the public sector.
6. Cloud-type-framework refers to internet-driven data management networks.
7. The case can be made that evaluation, implementation and design are institutional structures as well. For simplicity of representation, it helps to treat these constructs as functions. The legislative, network, civil society and agency contexts are obviously more complex than represented in Figure 1, but such simplifications are found appropriate here.

REFERENCES

"A Special Report on Technology and Government." (2008). *The Economist*. [Online]. Available at www.economist.com/node/10638002. [Retrieved July 15, 2012].

Aboelmaged, M. G. (2010). "Predicting e-Procurement Adoption in a Developing Country: An Empirical Integration of Technology Acceptance Model and Theory of Planned Behaviour." *Industrial Management & Data Systems, 110* (3): 392-414.

Andersen, K. V. (2004). *E-Government and Public Sector Process Rebuilding (PPR): Dilettantes, Wheelbarrows, and Diamonds*. Boston, MA: Kluwever Academic Publishers.

Angeles, R. & Nath, R. (2007). "Business-to-Business e-Procurement: Success Factors and Challenges to Implementation." *Supply Chain Management: An International Journal*, *12* (2): 104-115.

Arrowsmith, S. & Davies, A. (1998). *Public Procurement: Global Revolution*. Boston, MA: Kluwer Law International.

Bof, F., & Previtali, P. (2007). "Organisational Pre-Conditions for e-Procurement in Governments: The Italian Experience in the Public Health Care Sector." *The Electronic Journal of e-Government, 5* (1): 1-10.

Barua, A., Prabhudev, K., Whinston, A. B., & Yin, F. (2001). "Driving e-Business Excellence." *MIT Sloan Management Review, 43* (1): 36-44.

Bouwman, H., van den Hooff, B.,van den Wijngaert, L., & van Dijk, J. (2005). *Information and Communication Technology in Organizations*. Thousand Oaks, CA: Sage Publications.

Brainard, L., & McNutt, J. (2010). "Virtual Government-Citizen Relations: Informational, Transactional, or Collaborative?" *Administration & Society, 42* (7): 836-858.

Brandon-Jones, A., & Carey, S. (2010). "The Impact of User-Perceived e-Procurement Quality on System and Contract Compliance." *International Journal of Operations & Production Management, 31* (3): 374-396.

Brown, T. L., Potoski, M., & van Slyke, D. M. (2006). "Managing Public Service Contracts: Aligning Values, Institutions and Markets." *Public Administration Review, 66* (3): 53-67.

Brown, T. L., Potoski, M., & van Slyke, D. M. (2007). "Trust and Contract Completeness in Tthe Public Sector." *Local Government Studies,* 33 (4): 607-623.

Brown, T. L., Potoski, M., & van Slyke, D. M. (2009). "Contracting for Complex Products." *Journal of Public Administration Research and Theory*, 20 (Supplement 1): I41-I58.

Carayannis, E. G., & Popescu, D. (2005). "Profiling a Methodology for Economic Growth and Convergence: Learning from the EU e-Procurement Experience for Central and Eastern European Countries." *Technovation, 25* (1): 1-14.

Coursey, D., & Norris, D. F. (2008). "Models of e-Government: Are They Correct? An Empirical Assessment." *Public Administration Review,* 68 (3): 523-536.

Croom, S. (2000). "The Impact of Web-based Procurement on the Management of Operating Resources Supply." *The Journal of Supply chain Management, 36* (1): 4-13.

Croom, S., & Johnston, R. (2003). "E-service: Enhancing Internal Customer Service through e-Procurement." *International Journal of Service Industry Management, 14* (5): 539-555.

Croom, S., & Brandon-Jones, A. (2005). "Key Issues in E-Procurement: Procurement Implementation and Operation in the Public Sector." *Journal of Public Procurement, 5* (3): 367-387.

Dalcher, D., & Genus, A. (2003). "Introduction: Avoiding IS/IT Implementation Failure." *Technology Analysis & Strategic Management, 15* (4): 403-407.

Daly, J. L., & Buehner, M. A. (2003). "P-card Utilization in Municipal Government: Advantages and Concerns." *Journal of Public Procurement, 3* (1): 75-94.

Davila, A., Gupta, M., & Palmer, R. (2003). "Moving Procurement Systems to the Internet: The Adoption and Use of e-Procurement Technology Models." *European Management Journal, 21* (1): 11-23.

De Boer, L., Harink, J., & Heijboer, G. (2002). "A Conceptual Model for Assessing the Impact of Electronic Procurement." *European Journal of Purchasing and Supply Management, 8* (1): 25-33.

Diggs, S. N. & Roman, A. V. (2012). "Understanding and Tracing Accountability within the Public Procurement Process: Interpretations, Performance Measurements and the Possibility of

Developing Public-Private Partnerships." *Public Performance & Management Review, 36* (2): *289-314.*

Dunleavy, P., Margetts, H., Bastow, S., & Tinkler, J. (2006). "New Public Management is Dead: Long Live Digital-Era Governance." *Journal of Public Administration Research and Theory, 16* (3): 467-494.

Eadie, R., Perera, S., & Heaney, G. (2010). "Identification and Ranking of e-Procurement Drivers and Barriers for Construction Organisations and Ranking of These from the Perspective of Quantity Surveyors." *ITcon Journal, 15*: 23-43.

Edmiston, K. (2003). "State and Local e-Government: Prospects and Challenges." *American Review of Public Administration, 33* (1): 20-45.

Enquist, B., Johnson, M., & Camén, C. (2005). "Contractual Governance for Sustainable Service." *Qualitative Research in Accounting & Management, 2* (1): 29-53.

Enquist, B., Camén, C., & Johnson, M. (2011). "Contractual Governance for Public Service Value Networks." *Journal of Service Management, 22* (2): 217-240.

Entwistle, T. (2011). "For Appropriateness or Consequences? Explaining Organizational Change in English Local Government." *Public Administration, 89* (2): 661-680.

Fountain, J. E. (2001). *Building the Virtual State: Information Technology and Institutional Change*. Washington, DC: Brookings Institution Press.

Gichoya, D. (2005). "Factors Affecting the Successful Implementation of ICT Projects in Government." *The Electronic Journal of e-Government, 3* (4): 175-184.

Gansler, J. .S, & Luby, R. E. (2004). *Transforming Government Supply Chain Management*. Lanham, MD: Rowman & Littlefield.

Gunasekaran, A., & Ngai, E. W. T. (2008). "Adoption of e-Procurement in Hong Kong: An Empirical Research." *International Journal of Production Economics, 113* (1): 159-175.

Hardy, C. A., & Williams. S.P. (2008). "E-government Policy and Practice: A Theoretical and Empirical Exploration of Public e-

Procurement." *Government Information Quarterly, 25* (2): 155-180.

Hawking, P., Stein, A., Wyld, D.C., & Foster, S. (2004). "E-Procurement: Is the Ugly Duckling Actually a Swan Down Under?" *Asia Pacific Journal of Marketing and Logistics, 16* (1): 3-26.

Henriksen, H. Z., & Mahnke, V. (2005). "E-procurement Adoption in the Danish Public Sector: The Influence of Economic and Political Rationality." *Scandinavian Journal of Information Systems, 2*: 85-106.

Hoque, K., Kirkpatrick, I., Londsdale, C., & de Ruyter, A. (2011). Outsourcing the procurement of agency workers: The impact of vendor managed services in English social care. *Work, Employment and Society, 25* (3): 522-539.

Hui, W. S., Othman, R., Omar, N. H., Rahman, R. A., & Haron, N. H. (2011). "Procurement Issues in Malaysia." *International Journal of Public Sector Management*, 24 (6): 567-593.

Karjalainen, K., & Raaij, E. M. (2011). "An Empirical Test of Contributing Factors to Different Forms of Maverick Buying." *Journal of Purchasing & Supply Management, 17* (3): 185-197.

Kettl, D. F. (2002). *The Transformation of Governance*. Baltimore, MD: Johns Hopkins University Press.

Kettl, D. F. (2005). *The Global Public Management Revolution* (2nd ed.). Washington, DC: Brookings Institution Press.

Kheng, C. B. & Al-Hawandeh, S. (2002). "The Adoption of Electronic Procurement in Singapore." *Electronic Commerce Research*, *2* (1): 61-73.

Koh, C. E., Prybutok, V. R., & Zhang, X. (2008). "Measuring e-Government Readiness." *Information & Management,* 45 (8): 540-546.

Lee, M. J. (2010). An exploratory study on the mature level evaluation of e-procurement systems. *Journal of Public Procurement, 10* (3), 405-427.

MacManus, S. A. (2002). "Understanding the Incremental Nature of e-Procurement Implementation at the State and Local Levels." *Journal of Public Procurement, 2* (1): 5-28.

McCrudden, C. (2004). "Using Public Procurement to Achieve Social Outcomes." *Natural Resources Forum, 28* (4): 257-267.

McCue, C., & Roman, A. V. (2012). "E-procurement: Myth or Reality?" *Journal of Public Procurement, 12* (2): 212-238.

Mishra, A. N., Prabhudev, K., & Barua, A. (2007). "Antecedents and Consequences of Internet Use in Procurement: An Empirical Investigation of U.S. Manufacturing Firms." *Information Systems Research, 18* (1): 103-120.

Mitchell, K. (2000). "Instituting e-Procurement in the Public Sector" *Public Management, 82* (11): 21-25.

Moon, J. M. (2002). "The Evolution of e-Government among Municipalities: Rhetoric or Reality?" *Public Administration Review, 62* (4): 424-433.

Moon, J. M. (2003). "State Government e-Procurement in the Information Age: Issues, Practices and Trends." In M. A. Abramson and T. L. Morin (Eds.), *E-government* (pp. 177-236). Lanham, MD: Rowman & Littlefield Publishers.

Moon, J. M. (2005). "E-procurement Management in State Governments; Diffusion of e-Procurement Practices and Its Determinants." *Journal of Public Procurement*, *5* (1): 54-72.

Mota, F. P.B., & Filho, J. R. (2011). "Public e-Procurement and the Duality of Technology: A Comparative Study in the Context of Brazil and of the State of Paraiba." *Journal of Information Systems and Technology Management, 8* (2): 315-330.

Norris, D.F., & Moon, J. M. (2005). "Advancing e-Government at the Grassroots: Tortoise or Hare?" *Public Administration Review, 65* (1): 64-75.

Panayiotou, N. A., Gayialis, S. P., & Tatsiopoulos, I. P. (2004). "An e-Procurement System for Governmental Purchasing." *International Journal of Production Economics*, *90* (1): 79-102.

Pavlichev, A. & Garson, D. G. (Eds.) (2004). *Digital Government: Principles and Best Practices*. Hershey, PA: Idea Public Group.

Peck, F., & Cabras, I. (2011). "The Impact of Local Authority Procurement on Local Economies: The Case of Cumbria, North West London." *Public Policy and Administration, 26 (3)*: 307-331.

Pew Center of the States. (2008). *Government Performance Project: Grading the States 2008*. [Online]. Available at http://www.pewcenteronthestates.org/gpp_report_card.aspx. [Retrieved August 1, 2012].

Preuss, L. (2007). "Buying into the Future: Sustainability Initiatives in Local Government Procurement." *Business Strategy and the Environment, 16* (5): 354-365.

Romzek, B. S., & Johnston, J. M. (2005). "State Social Services Contracting: Exploring the Determinants of Effective Contract Accountability." *Public Administration Review, 65* (4): 436-449.

Orlikowski, W. J. (1992). "The Duality of Technology: Rethinking the Concept of Technology in Organizations." *Organization Science, 3* (3): 398-427.

Orlikowski, W. J. (2000). "Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations." *Organization Science, 11* (4): 404-428.

Somasundaram, R., & Damsgaard, J. (2005). "Policy Recommendations for Electronic Public Procurement." *The Electronic Journal of e-Government,* 3 (3): 147-156.

Sun, S. X., Jing, Z., & Wang, H. (2012). "An Agent Based Approach for Exception Handling in e-Procurement Management." *Expert Systems with Applications, 39* (1): 1174-1182.

Thai, K. V. (Ed.). (2009). *International Handbook of Public Procurement*. Boca Raton, FL: Taylor & Francis.

Thomson, J. D. (2009). "Remodeled and Restyled e-Procurement – New Power Relationships Down Under." *Electronic Journal of E-government*, *7* (2): 183-194.

Vaidya, K., Sajeev, A. S. M., & Callender, G. (2006). "Critical Factors that Influence e-Procurement Implementation Success in the Public Sector." *Journal of Public Procurement, 6* (1-3): 70-99.

Varney, M. (2011). "E-Procurement — Current Law and Future Challenges." *ERA-Forum, 12* (2): 185-204.

Walker, H., & Brammer, S. (2012). "The Relationship between Sustainable Procurement and e-Procurement in the Public

Sector." *International Journal of Production Economics*, *140* (1): 256-268.

West, D. M. (2005). *Digital Government: Technology and Public Sector Performance*. Princeton, NJ: Princeton University Press.

Yen, B., & Ng, E. (2002). "Migrating Procurement onto the Internet." *Electronic Commerce Research*, *2* (1): 113-134.

Zsidisin, G. A., & Ellram, L. M. (2001). "Activities Related to Purchasing and Supply Management Involvement in Supplier Alliances." *International Journal of Physical Distribution & Logistic Management, 31* (9): 629-646.

APPENDIX A
Survey

1. In what State, Province, or Territory is your entity located?
2. For what type of entity do you work?
3. Which BEST describes your position?
4. Which organizational structure BEST describes your procurement function?
5. Do you work for (indicate type of procurement function)?
6. What is the total number of full-time equivalent (FTE) employees in your procurement office?
7. What is your # of active contracts (do not include POs in this number)?
8. What is your # of informal 'written' (including email, fax, and on line) request for quotes issued per year?
9. What is your # of formal competitive solicitations (i.e., IFB, RFP) issued per year?
10. What is your # of POs processed per year?
11. What is your # of invoices processed per year?
12. What was your entity's total Operating expenditure on goods and services
    (regardless of how procured or paid) in FY 10?
13. What PERCENTAGE of the amounts above were under Procurement's responsibility?
14. What was your entity's total Capital Outlay expenditure in FY 10?
16. Are you using a state furnished system for any of the following functions?
17. Does your entity/agency use any other Procurement software?

18. Please estimate the approximate NUMBER OF YEARS your entity has been using procurement software of any type?
19. Please indicate how each capability is provided in your current configuration.
20. To what extent are these capabilities integrated with your financial system?
21. How would you rate your satisfaction with the capabilities of your software?
22. What level of benefit have you found in the following aspects of using a procurement software system?
23. What PERCENTAGE of your total system cost is covered by each type of fee?
24. If you use an electronic catalog function for requisitioning, does it provide special attention to green products?
25. Did you enhance or modify your procurement software system to help compliance with federal stimulus reporting requirements?
26. Which commodity coding system do you use with the software?
27. Are you currently planning to implement new or additional procurement software?
28. Are you currently planning to implement procurement software?
29. What PRIMARY reason has prevented you from implementing a procurement software system?
30. How would you rank the following benefits of using procurement software?