

A Toolkit for Prototype Implementation of E-Governance Service System Readiness Assessment Framework

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Abstract. Increasing importance of Open government, E-Participation and Cross-organizational coherence today has clearly shifted the focus towards building and managing, integrated and coordinated government services. This shall not only satisfy citizens' need but also improve governance issues automatically.

In reality, the level of integration, openness and participatory initiatives which are fundamental characteristics of good governance are still in their early stages of development, especially in developing nations. There is much debate among scholars about what constitutes E-Governance success, what methods are best for measuring it, and which variables best describe it.

This research paper presents an E-Governance Readiness Assessment Toolkit as a prototype implementation. The toolkit evaluates each procurement practice of Procuring Agencies for transparency and accountability. The solution is for an indigenous and ongoing case study dealing with the Public Procurement Management System for one of the province of Pakistan. The user bases of the system include people with strong diversity in literacy, poverty indexes, and deteriorating governance. The toolkit is acting as government and public awareness system to check the violation of government policies, rules and regulations pertaining to massive mis-procurements amounting millions of dollars.

Keywords: Human centered design and user centered design · Maturity models in HCI · Service design · Service engineering · Citizen involvement · E-Government · Evaluation methods and techniques · Qualitative and quantitative measurement and evaluation · User experience

1 Introduction

Improving governance and public participation has become a priority for sustainable economy and socio-technical development. Governments are increasing their capacities to achieve these goals. They are trying to transform all public administrations from isolated techno-bureaucratic institutions to a more engaging and accountable citizen centric institutions making them more transparent, responsive, effective and, trusted.

E-Governance has been emerged as a research area that involves use of Information and Communication Technologies (ICT) to reconcile and transform the relations among citizens and governments by enhancing citizens' participation in public decision-making [4, 31]. Recent proliferation in digital media offers a variety of novel characteristics related to interactivity, ubiquitous connectivity, and inclusiveness in social networking enabling new forms of society-wide collaboration with a potential impact on democratic participation [30].

To increase positive development outcomes, it is necessary to understand how E-Governance works in different spheres – political, legal-judicial, administrative, economic and socio-environmental [5]. However, despite the widespread efforts to implement E-Governance through research programs, new technologies and projects, the exhaustive studies on the achieved outcomes reveal that it has not yet been successfully incorporated in institutional policy, politics, and governments' readiness [24, 30]. Governments and public administrations hardly use E-Participation during decision-making and policy execution phases [30]. Hence, E-Participation is primarily understood from the legitimacy standpoint rather than as an effective input to influence institutional policy and politics [24, 30]. There is also a generalized trust deficit in representative democracy. According to the latest Euro Barometer Survey [6], the average level of trust in national governments is approximately 27 %.

Thus it is a challenge to come up with a new framework for assessing E-Governance service system readiness given the complexity and controversy involving the subject. This paper suggests that the cornerstone for successfully implementing E-Governance framework in public institutions, as a sustainable added-value activity, involves Human Centered design automation, embodying the principles of E-Participation, Open and Connected-Government.

Following these considerations, this research stands to contribute by proposing a readiness assessment toolkit which is typically needed for the evaluation of all public Procuring Agencies (PAs) for an ongoing pilot project called Procurement Performance Management System (PPMS) of Sindh Public Procurement Regulatory Authority (SPPRA)-a public organization of the Province of Sindh, Pakistan. Weak governance in public procurement hinders market competition and raises the price paid by the administration for goods and services, direct impacting public expenditures and therefore taxpayers' resources [7]. The prototype implementation of E-Governance service, checks the violation of government policies, rules and regulations pertaining to massive mis-procurements amounting millions of dollars.

E-Participation sustainability is heavily dependent on organizational planning and adaptation of open and connected governments thus demanding a holistic engineering approach [10, 14, 17]. Consequently, this research problem consists in endorsing a prototype implementation of E-Governance Service System Readiness Assessment framework that reflects the E-Participation concepts in the structure, operations and policy-making value chain of governments and public administration.

2 Relevance and Importance

The problem of E-Governance is not only related to Management Information Systems (MIS) but now it also emerges as Human Computer Interaction (HCI) and as a Complex, Large-scale, Interconnected, Open, and Socio-technical (CLIOS) system. HCI and Human Intensive Systems (HIS) modeling can effectively be used to design and develop Citizen participatory service systems. It further requires a good understanding and management towards cross disciplinary crowd working and related socio-technical issues.

The latest edition of the United Nations E-Government Survey (2014) [29] assesses the E-Participation status of the 193 United Nations Member States as E-Participation Index (EPI-2014), as depicted in the Fig. 1. The report acknowledges that careful strategies are needed to further improve an enabling environment for E-Participation.

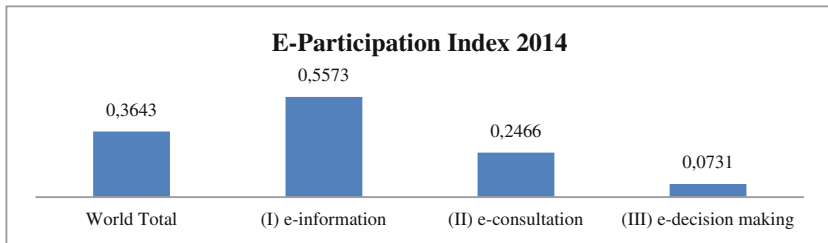


Fig. 1. Shows the average scores of three stages of E-Participation Index (EPI) – 2014 individually and an overall average score of World Total [29].

According to UN the three stages of E-Participation are: e-information, e-consultation, and e-decision making. Interestingly, the overall average score of World Total does not reflect the actual picture of average participations up to the stage 3 (See Fig. 1). This shows that the potential for online participation is still in its early stages of development.

Nevertheless, E-Participation has been witnessed to be a major performance indicator for E-Governance [8, 25–29], many challenges still remaining, including, among others, the inadequacy of institutional change processes and the lack of innovative E-Government leadership [29]. The developed countries, those are good in E-Governance initiatives also performing well in E-Participation maturity levels [15].

Whereas, the implementation of E-Participation maturity levels require an understanding of a multitude of interdependent key dimensions, including openness, backend automation, stakeholders' trust, subjective norms, tools and technologies, rules of engagement, duration and sustainability, accessibility, promotion of HCI and online social networking [12]. These are the critical success factors for implementing true E-Participation, besides others discussed above.

The previous studies supported that citizens with a high level of trust in the government and increasing subjective norms are more motivated to actively participate in government initiated E-Participation tools [2].

The authors, in [9, 13], highlighted that online social networking allowed for the fast mobilization of citizens and the transfer of immediate information. Further, [9, 19] highlighted that how HCI increases with the emergence of web 2.0 technologies and technical tools that enhance support, convenience and understanding in government-citizen communications on a daily basis.

The Stakeholders are primarily called Initiatives Actors with an active role in processes, such as target citizens, subject-matter experts and decision-makers. The two primary groups of interactive stakeholders that can be distinguished in E-Governance concepts are itself Government (G), and Citizens (C), so that the E-Governance readiness assessment plan can be efficiently assessed by their all possible 4-staged group interactions as: G2C, C2G, G2G, and C2C.

Whereas the levels of engagement determine the extent to which the participants take part in the decision-making process and can comprise different levels of involvement. Various topologies of E-Participation engagement levels are introduced and discussed [1, 7, 11, 12, 16, 23, 33]. In [32], the authors have defined and proposed a modified schema of engagement levels as a 4-staged implementation of E-Participation maturity model namely: E-Informing, E-Collaborating, E-Consulting, and E-Empowering. They are defined as:

E-Informing. Providing information (either by government or by citizens) in a one-way channel {G2C}. The value to the citizen is that government information is publicly accessible; processes and functions are described and open; and thus become more transparent, which improves democracy and service. For example, citizen can use search engines for information and are able to download all sorts of forms and documents.

E-Collaborating. Allowing stakeholders (citizens and government) to collaborate their opinions on specific issues of official initiatives in a limited two way channel without online transactions {G2C, C2G}. For example, citizen can ask questions via e-mails.

E-Consulting. The responsibility of final decision is on the government side but the stakeholders play an active role in proposing and shaping policy in an advanced two-way channel consultation {G2C, C2G, G2G}. Complete online transactions can be done without going to an office. Internal and back-end automation of processes have to be redesigned for vertical integrations to provide good services.

E-Empowering. Facilitates the transfer of influence, control, and policy making to the citizen, so the final decision becomes in the public hands {G2C, C2G, G2G, C2C}. All information systems are horizontally integrated and the citizen can get services at one counter. One single point of contact for all services is the ultimate goal.

If we superimpose this E-Participation maturity model on E-Governance 4-staged group interactions, we will get a 4 quadrant matrix as shown in Fig. 2:

Waseem, et al. in [32], suggested that the HCI's Computer Supported Cooperative Work (CSCW) time/space groupware matrix is an effective approach for expressing 4-stages of E-Participation maturity model against the time and space limits of participatory work to support human ICT-mediated interaction, consequently, approaching an E-Governance Service System Readiness Assessment Framework.

Stage 3 {G2C, C2G, G2G} E-Consulting	Stage 4 {G2C, C2G, G2G, C2C} E-Empowering
Stage 1 {G2C} E-Informing	Stage 2 {G2C, C2G} E-Collaborating

Fig. 2. Superimposition of E-Participation maturity model on E-Governance 4-staged group interactions as 4 quadrant matrix.

2.1 Outcome of a Research Field Survey

In support of our study, the authors here give reference of a research field survey which was conducted by [32] in a local context from 30 government agencies of Pakistan. The survey was conducted to test the online participatory services, offered to the public, in the government department’s website(s) for E-Governance Service System Readiness initiatives as per the implementation stages of E-Participation maturity model. The survey concluded that the E-Participation facilities up to the stages 3 and 4 are not available in most of the departments of Pakistan. This proves that the potential for online Participation is still in its early stages of development especially in nations with weak governance.

Following the recent trends and outcomes, it is found that the maturity of stages of E-Participation is essential for E-Governance readiness assessment model. Fortunately, the social extension seeks to optimize processes by enhancing collaboration among stakeholders through the use of Web 2.0 and social media [18]. This increases the motivations for creating socially enabled processes and engaging a broader community in the generation of awareness on the process outcome [3].

3 Choosing SPPRA as a Case Study

The Sindh Public Procurement Regulatory Authority (SPPRA) is a body corporate responsible for prescribing regulations and procedures for the public procurements procured by public sector organizations of Sindh Government.

The SPPRA become fully functional in October 2008. Procurement Legislation introduced in May 2009 with enactment of SPPRA Act 2009. A new set of Rules i.e. Sindh Public Procurement Rules-2010 notified on 8th March 2010 [20].

The ideology of the authority is centered at improving governance, management, transparency, accountability and quality of public procurements of goods, works and services; including consultancy and public-private partnership.

Presently SPPRA has a massive task of coordinating and evaluating the procurement activities of around 730 Procuring Agencies (PAs) – any department or office of Government; or District Government who is registered to procure. This number is expected to rise in coming days. Therefore, SPPRA requires a readiness assessment toolkit that not only facilitates all PAs and the Authority about the procurement processes but also provides an assessment scorecard of each PA for their procurement performances evaluating in terms of compliance of regulations, efficient governance, transparency and decision making.

4 Implementation of E-Participation Maturity Model

The authors suppose that the presented E-Participation maturity model can be implemented on any type of participatory processes workflows that may contain some sort of maturity levels to accomplish a task or a service. To demonstrate this implementation, the authors consider the case study of SPPRA as an example.

As such, if we divide the flowcharts of Basic Procurement Process and Complaint Redressal Mechanism of SPPRA [21] and [22] into four modules related to the 4-stages of E-Participation maturity model, we get Figs. 3 and 4 illustrated below:

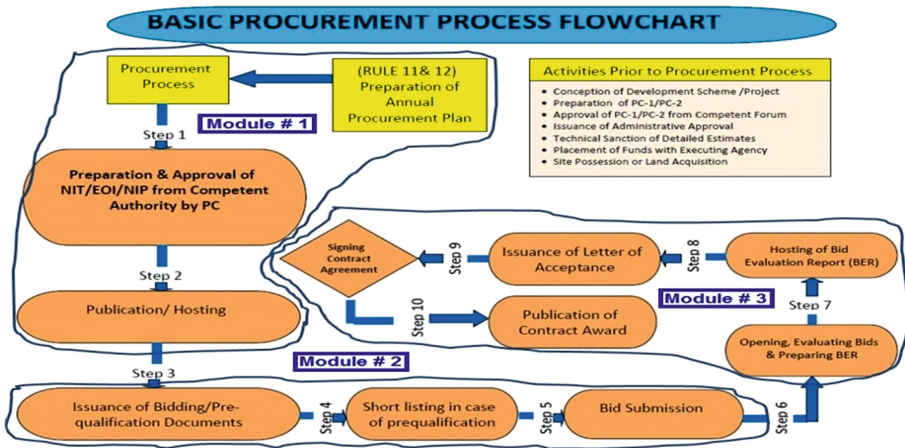


Fig. 3. Division of processes into 1st, 2nd, 3rd modules mapping E-Participation maturity model

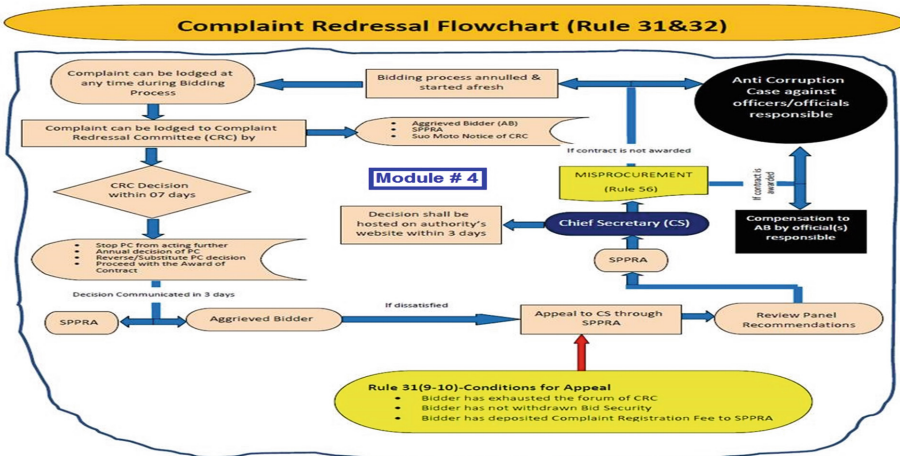


Fig. 4. Selecting all processes into 4th module mapping with E-Participation maturity model

Then if we synchronize the processes of highlighted modules altogether of both figures with the 4-stages of E-Participation maturity model, we can get Table 1 as:

Table 1. Mapping of 4 Modules with the 4-stages of E-Participation maturity model

Stages	E-Participation Stages	Modules	Processes
I	E-Informing {G2C}	1	Procurement Plan; Approval by PC; Advertisement/Hosting of NIT/NIP/EOI
II	E-Collaborating {G2C, C2G}	2	Issuance of Bidding/Prequalifying/RFP Documents; Submission of Prequalification; Short-listing; Bid Submission
III	E-Consulting {G2C, C2G, G2G}	3	Bid Opening & Evaluation; Bid Evaluation Report (BER); Contract Award/Execution; Contract Close/Completion
IV	E-Empowering {G2C, C2G, G2G, C2C}	4	Complaint Redressal Mechanism

Table 1 shows that how the workflows of SPPRA are efficiently correlated with the 4-stages of E-Participation maturity model.

5 Design of the Procurement Process Readiness Assessment Toolkit

The Toolkit is designed to assess readiness of procuring agencies by using the score they get in the compliance of rules and regulations under Sindh Public Procurement Rules-2010 during their procurement practices. This toolkit facilitates all types of procurements like goods, works, services, consultancy services and public private partnership projects, carried out by all procuring agencies. It proceeds and evaluates each prescribed rule while the workflow advances up to the last stage of procurement process as seen in Table 2 below. The stages of procurements are mapped with the 4-stages of E-Participation maturity model as discussed above. The procurement stages are mapped according to their relevance.

For evaluating each PA's procurement practices, the scorecard shall be measured on some prescribed scale. It shall be measured on the basis of the compliance or not compliance of the rules that are to be encountered during procurement processes and business rules. The scale of the score varies depending on the nature of the rules. It may be any numerical range of values or a Boolean value. Each procurement stage contains a set of key rules appropriate for evaluation of a particular procurement type.

Table 2. Procurement Process Readiness Assessment Toolkit under Sindh Public Procurement Rules-2010 [20] for the Procuring Agencies of SPPRA

Procurement Process Readiness Assessment Toolkit for PAs of SPPRA														
Stage	E-Participation Stages	Procurement Stages	Goods	Score	Works	Score	Services	Score	Consultancy	Score	PPP Projects	Score		
I	E-Informing (G2C)	Procurement Plan (R11-12)	R 16		R 16		R 16							
			R 14		R 14		R 14							
			Procurement Committee (PC)		Procurement Committee (PC)		Procurement Committee (PC)		Procurement Committee (PC)		Consultant Selection Committee (CSC)		Technical & Financial Eva Committee (TFEC)	
			R 7		R 7		R 7		R 7		R 67		R 81 (3)	
			R 8		R 8		R 8		R 8		R 68		R 82 (2)	
		Publications/Advertisement/Hosting	R 6		R 6		R 6		R 6		R 6		R 6	
			R 17		R 17		R 17		R 17		R 17		R 17	
			R 18		R 18		R 18		R 18		R 18		R 18	
			R 19		R 19		R 19		R 19		R 19		R 19	
			R 46		R 46		R 46		R 46		R 46		R 46	
		Notice Inviting tender (NIT)	R 47		R 47		R 47		R 47		R 47		R 47	
			Notice Inviting tender (NIT)		Notice Inviting tender (NIT)		Notice Inviting tender (NIT)		Notice Inviting tender (NIT)		Inviting Expression of Interest (EOI)		Notice Inviting Prequalification (NIP)	
			R 15		R 15		R 15		R 15		R 62		R 15	
											R 63		R 27	
											R 65		R 28	
II	E-Collaborating (G2C, C2G)	Short listing/ Assurance of Documents												
			Assurance of Tender Documents		Assurance of Tender Documents		Assurance of Prequalifying Documents		Assurance of RFP Documents		Issuance of Bidding/RFP Documents			
			R 20		R 20		R 20		R 20		R 20		R 20	
			R 21		R 21		R 21		R 21		R 75		R 21	
		Bid Submission	R 22		R 22		R 22		R 22		R 22		R 22	
			R 23		R 23		R 23		R 23		R 23		R 23	
			R 29		R 29		R 29		R 29		R 29		R 29	
			R 44		R 44		R 44		R 44		R 44		R 44	
													R 82 (5)	
		E-Consulting (G2C, C2G, G2G)	Bid Opening & Evaluation	R 30		R 30		R 30		R 30		R 30		R 30
				R 41		R 41		R 41		R 41		R 41		R 41
				R 42		R 42		R 42		R 42		R 42		R 42
				R 43		R 43		R 43		R 43		R 43		R 43
				R 48		R 48		R 48		R 48		R 48		R 48
Contract Award/Execution	R 52		R 52		R 52		R 52		R 52		R 52			
	R 53		R 53		R 53		R 53		R 53		R 53			
											R 84			
IV	E-Empowering (G2C, C2G, C2C)	Complaint Redressal	R 31 (2)		R 31 (2)		R 31 (2)		R 31 (2)		R 31 (2)			
			R 31 (3)		R 31 (3)		R 31 (3)		R 31 (3)		R 31 (3)			
			R 31 (4)		R 31 (4)		R 31 (4)		R 31 (4)		R 31 (4)			
			R 31 (5)		R 31 (5)		R 31 (5)		R 31 (5)		R 31 (5)			
			R 31 (8)		R 31 (8)		R 31 (8)		R 31 (8)		R 31 (8)			
		Contract Close /Completion	R 31 (9-10)		R 31 (9-10)		R 31 (9-10)		R 31 (9-10)		R 31 (9-10)		R 31 (9-10)	
			R 31 (11-13)		R 31 (11-13)		R 31 (11-13)		R 31 (11-13)		R 31 (11-13)		R 31 (11-13)	
			R 31 (15)		R 31 (15)		R 31 (15)		R 31 (15)		R 31 (15)		R 31 (15)	
			R 56		R 56		R 56		R 56		R 56		R 56	
		Total												

All such rules could not be defined here because of the insufficient space. Some of them are listed below as an example.

R11 & R12 (Activities prior to Procurement process):

- Conception of development Scheme/Project
- Preparation of PC I/ PC II
- Approval of PC I/ PC II from competent authority
- Issuance of Administrative approval
- Technical sanction of detailed estimate
- Placement of funds with executing Agency
- Site possession or land acquisition

R15 (Type of Bidding): Open Competitive Bidding

- 1) International Competitive Bidding (ICB)
 - Open to local and international parties
 - Default method is for \geq US \$ 10 M
- 2) National Competitive Bidding (NCB)
 - Open to local but international parties may participate
 - Default method is for $<$ US \$ 10 M

R17 (Advertisement):

- If $>$ 100,000 to \leq 1,000,000 SPPRA+ P.A website
- If $>$ 1,000,000 SPPRA+ P.A website + 3 widely circulated newspapers (EUS)

R18 (Response Time):

- NCB \geq 15 days
- ICB \geq 45 days

From 1st publication

R21 (Contents of Bidding Documents):

- (a) Letter of invitation for bid;
- (b) Data sheet containing information about the assignment;
- (c) Instructions for preparing bids;
- (d) Amount and manner of payment of bid security and performance guarantee (where applicable);
- (e) Manner and place, date and time for submission of bidding documents;
- (f) Manner, place, date and time of opening of bids;
- (g) Method of procurement used;
- (h) A detailed and unambiguous evaluation criteria;
- (i) Terms and conditions of the contract agreements, as far as already known by the procuring agency;
- (j) Terms of Reference and technical specifications of goods, works or services to be procured, subject to Rule 13;
- (k) Manner in which tender price is to be assessed and computed, including information about tax liability;
- (l) Currency in which tender price is to be formulated and expressed;
- (m) Bid validity period;
- (n) A copy of integrity pact to be signed by the parties (where applicable).

R89 (Integrity Pact):

- If procurement is $>$ Rs 10 m for goods and works, and $>$ Rs 2.5 m for services shall be subject to an integrity pact.

The complete details of rules and regulations used in this toolkit under Sindh Public Procurement Rules-2010 can be seen on the SPPRA's official website [20].

The Procurement Process Readiness Assessment Toolkit is necessary to keep an eye on the track record of all procuring agencies for corruption control, transparency, openness, and for any mis-procurement. A precise decision can be made easily on the bases of such evaluation.

6 Future Directions

For efficient implementation of the proposed readiness assessment toolkit, a balanced scorecard is necessary for measuring precise score of each regulation of procurement process. Therefore, it would be designed as our future work.

On the basis of such scorecard a procurement process readiness assessment ranking of all procuring agencies can be established.

7 Conclusion

The problem of E-Governance is not only related to Management Information Systems (MIS) but now it also emerges as Human Computer Interaction (HCI) and as a Complex, Large-scale, Interconnected, Open, and Socio-technical (CLIOS) system. The present research is also suggested that the cornerstone for successfully implementing E-Governance in public institutions, as a sustainable added-value activity, is a systematic organizational planning and automation, embodying the principles of E-Participation, Open and Connected-Government. HCI and Human Intensive Systems (HIS) modeling can effectively be used to design and develop such systems. It further requires a good understanding and management towards cross disciplinary crowd working and related socio-technical, political, and environmental issues.

This research stands to contribute in increasing the performance of Government on corruption control and on participatory governance by proposing a readiness assessment toolkit for an ongoing and indigenous case study related to public procurements of public sector organizations in a province of Pakistan.

This toolkit can assess readiness of procuring agencies using the score they get in the compliance of rules and regulations under Sindh Public Procurement Rules-2010 of SPPRA during their procurement practices. The use of this toolkit will be the test of quality of governance in the State. While doing so, the Government must accord highest importance to transparency and fairness in data collection, analysis and in decision making. The toolkit is practically and efficiently superimposed on the 4 stages of E-Participation maturity model. Hence it shall be a prototype implementation of E-Governance service system readiness assessment framework, proposed in [32].

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