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## E-PROCUREMENT STRATEGY AND ROADMAP

PAKISTAN

June 2014



## Table of Contents

Table of Contents.....	3
Abbreviations.....	5
Acknowledgements.....	6
Executive Summary.....	9
<b>PART I – STRATEGIC CONTEXT .....</b>	<b>16</b>
1. INTRODUCTION .....	16
<i>Traditional Procurement</i> .....	17
2. INTERNATIONAL EXPERIENCE .....	17
<i>Lessons</i> .....	20
3. READINESS - CHALLENGES AND GAPS .....	23
1. <i>Government Leadership &amp; Institutional Arrangements</i> .....	24
2. <i>Human Resources</i> .....	27
3. <i>Planning and Management</i> .....	29
4. <i>Policy</i> .....	30
5. <i>Legislation</i> .....	31
6. <i>Infrastructure and Web Service</i> .....	36
7. <i>Standards</i> .....	38
8. <i>Private Sector Integration</i> .....	39
9. <i>Systems</i> .....	41
<b>PART II – E-PROCUREMENT STRATEGIC PLANNING .....</b>	<b>44</b>
1. SCOPE .....	44
2. VISION AND OBJECTIVES .....	45
3. FUNCTIONAL REQUIREMENTS AND PRIORITIZATION .....	46
1. <i>Procurement Portal</i> .....	47
2. <i>Registration</i> .....	48
3. <i>E-Bidding</i> .....	49
4. <i>E-Purchasing</i> .....	49
5. <i>E-Framework Agreements</i> .....	50
6. <i>E-Catalogues</i> .....	52
7. <i>E-Payments</i> .....	53
8. <i>Procurement Management Information System (PMIS)</i> .....	55
9. <i>Workflow Management System</i> .....	56
10. <i>E-Contract Management Module</i> .....	56
11. <i>FMIS Interface</i> .....	57
12. <i>Help Desk</i> .....	57
4. TECHNICAL REQUIREMENTS .....	57
5. SPECIFICATIONS FOR CONTRACTING SYSTEM DEVELOPMENT .....	58
6. OWNERSHIP, DEVELOPMENT AND SUPPORT .....	59
<b>PART III – IMPLEMENTATION ROADMAP .....</b>	<b>63</b>
1. INSTITUTIONAL REQUIREMENTS.....	63
1. <i>PPRA</i> .....	64
2. <i>Project Steering Committee (PSC)</i> .....	64
3. <i>Project Implementation Committee (PIC)</i> .....	64
4. <i>Project Management Unit (PMU)</i> .....	65
5. <i>Project Advisory Council (PAC)</i> .....	65
2. PROJECT MANAGEMENT.....	66
3. MANAGEMENT REGULATIONS, LEGISLATION, BUSINESS MODEL.....	66
1. <i>Legislation</i> .....	68
2. <i>Business Model</i> .....	68
4. BUSINESS PROCESS RE-ENGINEERING (BPR).....	68

5. FUNCTIONS AND STANDARDS.....	71
6. INFRASTRUCTURE AND WEB SERVICES.....	71
7. CAPACITY BUILDING AND CHANGE MANAGEMENT .....	71
8. PRIVATE SECTOR ACTIVATION .....	73
9. ACTION PLAN .....	74
<i>Pilot Implementation</i> .....	77
<b>PART IV – FUNDING ESTIMATES .....</b>	<b>79</b>
OPTION I. ESTABLISHING COMMON UNITARY E-PROCUREMENT INFRASTRUCTURE .....	79
Option II. Separate e-Procurement Systems in Federal and each Province .....	80
<b>ANNEX 1 – TERMS OF REFERENCE.....</b>	<b>82</b>
<b>ANNEX 2 – FOOTNOTES TO THE LAW REGARDING E-PROCUREMENT .....</b>	<b>84</b>
<b>ANNEX 3 – E-SIGNATURES .....</b>	<b>88</b>
<b>ANNEX 4 – BUSINESS CASE .....</b>	<b>97</b>
<i>Financial and Non-Financial Impacts</i> .....	97
<i>Methods</i> .....	100
<i>Transparency, Reporting and Assessment</i> .....	100
<i>Pakistan Benefit / Cost</i> .....	101
<b>ANNEX 5 – NON-FUNCTIONAL REQUIREMENTS.....</b>	<b>104</b>
<i>Usability</i> .....	104
<i>User Security &amp; Administration</i> .....	106
<i>Information Communication, Interface and Storage</i> .....	108
<i>Interoperability</i> .....	109
<i>Risk Management and Security</i> .....	110
<i>Scalability</i> .....	111
<i>Performance Assessment</i> .....	111
<i>Hardware</i> .....	112
<b>ANNEX 6 – RELIABILITY AND PERFORMANCE MEASUREMENT .....</b>	<b>114</b>
<i>Reliability Metrics</i> .....	114
<i>System Performance</i> .....	116
<b>ANNEX 7 – PROJECT RISK MANAGEMENT .....</b>	<b>118</b>
<i>Risk Management Plan</i> .....	120
<b>ANNEX 8 - IMPLEMENTATION MONITORING AND EVALUATION.....</b>	<b>124</b>

## ***Abbreviations***

BOQ	Bill of Quantities
BPR	Business Process Re-engineering
COTS	Customised Off The Shelf system
CPV	Common procurement vocabulary
DRS	Disaster Recovery Site
EOI	Expression of interest
ETS	Electronic tendering system
EU	European Union
FAQ	Frequently Asked Questions
FMIS	Financial Management Information System
GDP	Gross domestic product
GOP	Government of Pakistan (National)
ICB	International Competitive Bidding
ICT	Information and Communications Technology
IMF	International Monetary Fund
IT	Information Technology
JV	Joint venture
KPI	Key Performance Indicator
M&E	Monitoring and evaluation
MDB	Multilateral Development Banks
NCB	National Competitive Bidding
NOA	Notice of award
OECD	Organisation for Economic Cooperation and Development
PAC	Project Advisory Committee
PE	Procuring entity
PIC	Project Implementation Committee
PITB	Punjab Information Technology Board
PKI	Public key infrastructure
PMIS	Procurement management information system
PMU	Project Management Unit
POC	Proposal opening committee
PPRA	Public Procurement Regulatory Authority
PPP	Public private partnership
PSC	Project Steering Committee
REOI	Requests for expressions of interest
RFP	Request for proposals
RFT	Request for tenders
SLA	Service level agreement
SOR	Schedule of Rates
TOC	Tender opening committee
UN	United Nations
UNSPSC	United Nations Standard Products and Services Code
UNCITRAL	United Nations Commission on International Trade Law

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## *Executive Summary*

***The governance of procurement is pivotal to public trust in government and is a barometer for the quality of public administration, making it a priority target for the strengthening in most governments.***

1 Public procurement is also a key aspect of public administration that links the public financial system with social and economic outcomes, and as such is a major determinant of the quality of community services and infrastructure, and the effectiveness of the Government. This function cuts across almost all areas of planning, programme management, and budgeting.

Different research shows:

- Government procurement accounts for a substantial proportion of Gross Domestic Product (15-20% or more in most countries)<sup>1</sup>;
- Public procurement in one form or another accounts for 70% of government expenditure in developing countries<sup>2</sup>.

2 It has also been recognised by the OECD<sup>3</sup> (2007) that “*public procurement is the government activity most vulnerable to waste, fraud and corruption due to its complexity, the size of the financial flows it generates and the close interaction between the public and the private sectors*”.

3 In Pakistan the public sector, excluding interest payments and defence<sup>4</sup>, accounts for approximately 10% of GDP. This represents approximately Ra 2300 billion for the 2013/14 financial year. Of this, about 30% is for non-salaries and wages. As a result of the introduction of e-Procurement, different countries have reported substantial savings ranging from 5-30% of public expenditure in public procurement. Even if it is assumed only 1% saving were made for Pakistan, this would mean approximately Ra 7000 million / year could be saved.

4 An e-Procurement Readiness Assessment and a Procurement Performance Benchmark Study were carried out with the focus on enabling drivers for the success of e-Procurement at the instigation of the World Bank Country office in Pakistan in consultation with the PPRAs during the Jan, 2014 – March, 2014. MDB e-Procurement Readiness Assessment Survey Questionnaire was updated to capture the Pakistan country context. Respondents from procuring entities, bidding community, private sector associations, government oversight and regulatory agencies and other stakeholders participated in the survey, and also stakeholders (PDEs, Ministries, professional associations, Internet and other service providers, oversight agencies, etc.) were consulted face-to-face.

5 Based on the assessments, Pakistan is, in general, ready for e-procurement in both the public and the private sector. The private sector is enthusiastic about the benefits of e-procurement.

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<sup>1</sup> Government Procurement at Gatt/WTO: 25 Years of Plurilateral Framework by Margaret Liang, 2007

<sup>2</sup> Fighting Collusion to optimize public procurement expenditure: The OECD Experience (<https://www.wbginvestmentclimate.org/uploads/WB%20-%20Bid%20rigging%20Presentation.pdf>), 30 March, 2011

<sup>3</sup> [www.oecd.org/document/5/0,3343,en\\_2649\\_34135\\_41883909\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/5/0,3343,en_2649_34135_41883909_1_1_1_1,00.html)

<sup>4</sup> It is arguable that some ordinary defence expenditures could be included under e-procurement as it is in some other countries

6 Following recommendations are made based on the findings and accepted best practices for the success of e-Procurement implementation:

***Leadership:***

7 National Procurement Strategy (2013-16) endeavours to lay down a roadmap for procurement regulators in Pakistan to realize the efficiency and transparency objectives and principles of public procurement. However, it is **recommended** that this policy statement be articulated more effectively at political level to clearly highlight the need for introducing e-Procurement reform as policy initiative.

8 It is **recommended** that there should be a common Unitary e-Procurement Infrastructure. Separate developments of e-procurement within individual provinces or within individual ministries or departments fragment the opportunities and should not be contemplated. Fragmented development increases cost and raises risks that systems would not be interoperable or would not have common core data capture that would enable proper performance assessments and financial integration. Fragmentation also exacerbates security risks.

9 It is **recommended** that the PPRAs adopt a common understanding of the unitary system as an information infrastructure rather than centralisation of procurement itself. It is **recommended** that individual entities and levels of government remain fully responsible and in control of what they buy, how much they buy and when they buy it – and that procurement remains fully decentralised but utilises a common infrastructure, just as it utilises other common national infrastructures for commerce such as the national procurement laws, and national banking systems. **The Common Unitary e-Procurement Infrastructure** refers to the establishment of a single set of Primary Data Centre and Disaster Recovery Centre. An e-Procurement Software Solution should be procured with licensing arrangement in such a way that the e-Procurement System database could be separately clustered for individual provinces. It should also provide facility for the separate instances of the user interface, procurement processes and practices of the e-Procurement portal could be configured based on the prevalent federal and provincial procurement processes and practices, but still having provision of interoperability and information exchange facilities across the provincial and federal portals.

10 In order to implement the e-Procurement reform at Federal and Provincial levels, it is **recommended** to assign the lead role to relevant PPRAs. If a National approach is adopted, the Federal PPRA can lead the coordination. It would be desirable for this program and institutional arrangement to be sanctioned with a public statement from the Federal Government<sup>5</sup> with the objectives of improving efficiency, transparency and business development

11 It is **recommended** that role responsibility for e-procurement be clarified. There is a perception that e-procurement is an IT department responsibility. E-procurement is very much a PPRA (or Finance) responsibility and the Federal and Provincial PPRAs should take the lead in this area to assert this reality. International experiences suggest that it has a little success if e-procurement initiative has been initiated by IT departments instead of PPRAs, as it is more close to the procurement management than the IT management.

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<sup>5</sup> Individual Ministerial authority is often insufficient. The e-Procurement programme represents a whole-of-government strategy that cuts across all Ministerial portfolios.

12 It is also desirable and **recommended** that the government signal its commitment to e-Procurement resolution publicly, and to set a timeframe for a comprehensive e-Procurement system to be operational. Key performance outcomes from this policy should also be signalled such as in relation to targeted savings and transparency.

#### ***Human Resources Management:***

13 It is **recommended** that the training and education programs should be conducted for the bidding community as well as government procurement personnel.

14 It is also **recommended** to consider setting up e-Procurement unit with required set of skills and expertise in each of the PPRAs for the implementation of e-Procurement System.

#### ***Planning and Management:***

15 Planning and management of procurement are governed by consistent legislation, standard bidding documents, and standard processes apply generally. The Business Process Reengineering (BPR) for e-Procurement is **recommended** for an efficient process.

16 It is **recommended** that a comprehensive procurement performance measurement and monitoring frameworks be developed and which should ultimately be integrated with the e-Procurement system as its core component.

#### ***Policy / Regulation:***

17 For all government e-Services working together, there is a need of a robust model for a Government Interoperability Framework, which the e-procurement also should encompass. It is **recommended** that the Federal Ministry of information Technology may focus on technical interoperability policy settings, security protocols and infrastructure, rather than application development. Online security has been weak.

18 It is **recommended** that the e-Procurement system specified in this project will be consistent with open international standards, and in particular will be based on Service Oriented Architecture (SOA).

19 It is also **recommended** that IT procurement via the e-Procurement portal should automatically attract a policy check flag to ensure that the buying processes are consistent with interoperability policies.

#### ***Legislation and Regulations:***

20 It is **recommended** that **e-Procurement guidelines be published**, which will document all the operational, technical, security, stakeholder relationship, terms and conditions of e-Procurement use, legal, compliance, performance, authentication, authority, processes and practices to be applied in case of e-Procurement.

21 It is **recommended** that the PPRA endorse in e-Procurement guidelines the equivalence of “in writing” in its current paper based procurement practice with the “electronic mean”. The Electronic Transaction Ordinance (2002) also mean “in writing” equivalence to the digital means of authentication. This would address the widespread confusion about the legal status of e-Procurement.

22 It is strongly **recommended** that the e-procurement system should avoid the requirement of digital certificates and PKI for authentication, and apply an alternative solution such as set out in the implementation plan.

***Infrastructure and Standards:***

23 It is **recommended** that the consultation among provinces and federal PPRAs should opt for using existing/established data centres and enhance that if required to reduce the cost of establishment of new data centre as well as ongoing operation and maintenance costs

24 It is **recommended** that the e-procurement system be designed around open international interoperability and middleware standards, and in particular be based on Service Oriented Architecture (SOA).

25 It is **recommended** that the Federal Ministry of information Technology focus on technical interoperability policy settings, security protocols and infrastructure, rather than application development. .

***Private Sector Integration:***

26 Private sector was found receptive to introduction of e-Procurement reform, however, there was strong requirement of regular supply side trainings and interaction to improve to competitive environment. It was **recommended** leading private sector association of constructors that e-Procurement be phased first with high value contracts as the firms participating are more active and have adequate IT capacity to handle and participate in e-bidding process. This is fully consistent with the international experience and is adopted in the Implementation Roadmap in Part III below.

27 It is **recommended** that the bidding community be consulted; required skills enhancement trainings are organized in regular basis; and partnered in e-procurement system implementation.

***Systems:***

There are several attempts by individual entities to develop e-procurement for their particular business.

28 Currently these developments are few and do not represent a major break-out of independent developments that would compromise an effective system. It is **recommended** that a unitary system proceed with some urgency while the advantages of e-procurement are not compromised by fragmentation.

Following consultations with the representatives from the Federal and Provincial PPRAs in May 2014, the following recommendations apply:

29 It is **recommended** that the Vision for the e-Procurement program be governed by the core principles of procurement including ***Governance, Efficiency and Economic development and investment and, more broadly, enhance trust in government.***

30 It was **recommended** above that a Common Unitary e-Procurement Platform with separate instances of e-Procurement Portal having individually clustered database and own administrative authority to manage federal or provincial

procurements still having cross provinces bidding opportunity postings. This would not encroach on the independent procurement management and organisation by individual provincial governments, and could best be considered as a common information infrastructure to be shared.

31 **Recommendation** The PPRA Boards endorse and approve the e-Procurement Strategy and implementation plan, as well as e-Procurement guidelines.

32 **Recommendation** Key stakeholders and individuals should be identified and co-opted into the support committees PSC, PIC, PAC.

33 **Recommendation** A Project Management Unit should be established by the PPRA, including co-opted members from other agencies if required.

34 **Recommendation** A set of project performance targets be established by the PPRA and used as a basis for reporting to the Government.

35 It is **recommended** that the government, primarily through the PPRA(s), itself maintain oversight of all e-Procurement procedures, since they are an integral part of government administrative functions, and accountability.

36 It is **recommended** that a Off-The-Shelf (COTS) product with customization having in-house ownership with outsourced O&M, option be adopted (Option 2, Table 12).

37 **Recommendation** A help desk be established during with the rollout of service modules. The help desk needs to be staffed by individuals with a service-oriented ethic who also know the subject matter or where to find it.

38 **Recommendation:** PPRA(s) to revise procurement processes and practices through Business Process Reengineering (BPR) to be consistent with the effective and efficient functioning of e-Procurement technology and should be documented in e-Procurement guidelines

39 It is **recommended** that a BPR committee be established by the PPRA including the system developer and involving major procuring entities, to review existing standard documentation and to minimise analogue information requirements.

40 It is **recommended** that the e-Procurement system should not make mandatory use of digital certificates and PKI for authentication, but will apply an alternative cost effective and fit-for-purpose solution for the acceleration of the e-Procurement rollout.

41 It is **recommended** that the Government (Provincial & Federal) should own and control its procurement system. However, both for the development of the system, and the ongoing maintenance, it is also **recommended** that the government consider private sector support, rather than trying to compete with the private sector to retain comprehensive skills in this area at public sector salaries.

42 It is **recommended** that the PPRA develop a policy on risk, reliability and performance requirements and determine whether to create additional facilities and document in e-Procurement guidelines.

43 It is **recommended** that a Training programme be established by the developer / service provider, to be approved by the PPRA, in order that procurement officers

from departments can be introduced to the systems and be able to walk through the screens. This training would be timed to coincide with rollout for respective departments commencing with the pilot agencies.

44 **Recommendation:** The PPRA develop a program to incorporate procurement managers in the transition to the e-Procurement environment as well as extend procurement training generally

45 It is also **recommended** that a lead-agency model be adopted to pilot the e-Procurement: This means that rollout should commence with just nominated lead agencies, each of which should be large procuring organisations. Not all procurement entities within these lead agencies need to be involved, but if possible some champions should be identified to lead.

46 It is **recommended** that the PPRA, in consultation with the major business associations, develop a business activation strategy to address existing government contracted suppliers, non-contracted suppliers and also work with the service industry that supports e-procurement applications.

47 It is **recommended** that rollout should be phased and that it be preceded by a pilot phase of implementation that should last for the period of at least one procurement cycle for one type of procurement method.

48 It is **recommended** that the e-Procurement system should be prepared at the outset with all major types of procurement methods and all major end-to-end procurement processes. Pilot implementation should not be based on a partial selection of procurement functions. All functions are equally important across the procurement process. Selection of procurement methods and procurement packages for the pilot implementation should be left to the Pilot organizations. E-Reverse Auctions are **not** recommended.

49 It is **recommended** that parallel bid submission of hard copy as well as electronic submission should not be part of a phased implementation. Parallel bid submission only increases additional burden to public sector agencies, and it slows down the e-Procurement rollout.

50 **Recommendation** A Training programme be established by the developer / service provider, to be approved by the PPRA, in order that procurement officers from departments can be introduced to the systems and be able to walk through the screens. This training would be timed to coincide with rollout for respective departments commencing with the pilot agencies.

51 **Recommendation:** The PPRA develop a program to incorporate procurement managers in the transition to the e-Procurement environment as well as extend procurement training generally. This program could include:

- An orientation and awareness program of half a day for all procurement officers in the public sector as each significant new functionality is activated.
- Access to high-level policy, management and technical advice through the Support Service.
- An awareness program for dissemination of e-Procurement objectives and characteristics to all stakeholders including executives and policy officers.

The program will separately target Executives, Policy Officials and Procurement professionals.

52 It is **recommended** that the PPRA launch a publicity campaign around the implementation, that builds up during the development phase and raises awareness in what changes can be expected for buyers and suppliers. A good campaign is likely to attract media attention on possible savings and efficiency improvements.

53 It is **recommended** that the PPRA, in consultation with the major business associations, develop a business activation strategy to address existing government contracted suppliers, non-contracted suppliers and also work with the service industry that supports e-procurement applications. The principal method of delivery of this strategy should include a road show around major centres providing business seminars, e-mail, and advertising and through the business associations.

## PART I – STRATEGIC CONTEXT

### 1. INTRODUCTION

*The governance of procurement is pivotal to public trust in government and is a barometer for the quality of public administration, making it a priority target for the strengthening in most governments.*

54 Public procurement is also a key aspect of public administration that links the public financial system with social and economic outcomes, and as such is a major determinant of the quality of community services and infrastructure, and the effectiveness of the Government. This function cuts across almost all areas of planning, programme management, and budgeting.

Different research shows:

- Government procurement accounts for a substantial proportion of Gross Domestic Product (15-20% or more in most<sup>6</sup> countries)<sup>7</sup>;
- Public procurement in one form or another accounts for 70% of government expenditure in developing countries<sup>8</sup>.

55 It has also been recognised by the OECD<sup>9</sup> (2007) that “*public procurement is the government activity most vulnerable to waste, fraud and corruption due to its complexity, the size of the financial flows it generates and the close interaction between the public and the private sectors*”.

56 Procurement policy regulates the public sector’s interactions with domestic and international markets in ways that directly impact national efficiency and competitiveness. Public procurement is a common vehicle for business and industry development policies, and most regional and bilateral trade agreements have significant provisions aimed at granting reciprocal access to domestic government procurement markets.

57 Poor management of procurement invariably reduces development outcomes and is likely to reduce foreign direct investment. These effects have already been reported by the International Monetary Fund<sup>10</sup> (IMF), which has identified national consequences for low and middle income countries in terms of (i) over-spending on capital, (ii) under spending on asset maintenance, (iii) poor quality infrastructure, and (iv) reduced government revenues.

58 The IMF study concluded that poor governance of procurement can result in infrastructure that reduces national growth - investment becomes a disinvestment.

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<sup>6</sup> As discussed in the following, a lesser figure is used for Pakistan

<sup>7</sup> Government Procurement at Gatt/WTO: 25 Years of Plurilateral Framework by Margaret Liang, 2007

<sup>8</sup> Fighting Collusion to optimize public procurement expenditure: The OECD Experience (<https://www.wbginvestmentclimate.org/uploads/WB%20-%20Bid%20rigging%20Presentation.pdf>), 30 March, 2011

<sup>9</sup> [www.oecd.org/document/5/0,3343,en\\_2649\\_34135\\_41883909\\_1\\_1\\_1\\_1.00.html](http://www.oecd.org/document/5/0,3343,en_2649_34135_41883909_1_1_1_1.00.html)

<sup>10</sup> Roads to Nowhere: V. Tanzi, H. Davoodi; 1998, International Monetary Fund, ISBN 1-55775-710-0



The poor quality and under-spending on maintenance also implies that what infrastructure exists has lower economic productivity.

59 For these reasons, the strengthening governance in procurement has been described as the single most significant option for development in many countries.

### ***Traditional Procurement***

60 Problems inherent in traditional paper-based procurement processes include incomplete management information, inefficient procedures, high compliance costs for suppliers and departments, simplistic and inferior procurement methodologies, and a profound lack of transparency. Persistence with paper-based procurement processes also slows the take-up of productive information technologies in the economy generally, and is characterised by:

- Uncoordinated buying across government with different departments having different contracts and different prices for the same goods;
- High process costs associated with testing the market;
- Out dated market intelligence;
- Maverick spending (off contract);
- Inefficient payments processes;
- Obsolete audit information;
- Error-prone contract management tracking.

61 In this traditional environment, many opportunities for improved social and economic outcomes are invisible because the relevant management and planning information is inaccessible.

62 Many of these issues can be partly or largely addressed through the effective use of information technologies, or e-Procurement. This Report<sup>11</sup> is concerned about the development and implementation of e-procurement in the Pakistan public sector - the terms of reference for this work are listed in Annex 1.

## **2. INTERNATIONAL EXPERIENCE**

63 International experience has varied widely with, in some cases, e-procurement being rolled out and adopted quickly, while in other cases rollout has been followed by only slow take-up if at all. In Andhra Pradesh, e-bidding was mandated and implemented without a transition period. In Bangladesh, a significant phase-in process over several years is currently underway for the complete system, and in Kazakhstan an e-procurement system is being phased in terms of individual functions. A partial system is being phased in by Nepal. Across the European Union (EU) as a whole, the development and application of e-Procurement has been slow by international standards (see Table 1)

64 Features of e-procurement are broadly similar between countries, differing in terms of the detail of national laws, customs, the supplier-base, and institutional

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<sup>11</sup> This Report also fulfils the role of a Feasibility Study.

arrangements. Some international experiences from which e-Procurement lessons and best and worst practices may be identified are summarized in Table 1.

**Table 1**  
**International Experiences**

Country	Policy Objectives	System	Components
Australia (State governments)	Efficiency Compliance Competition Transparency	Single unitary system in each State, with separate FMIS interface, open standards, web based, multiple buyer / supplier entities	E-advertising E-bidding, E-quoting, E-purchasing Integrated PMIS for workflow management, control and analyses
Bangladesh	Government managed model, Transparency Compliance Efficiency Competition	Single Electronic platform for all procuring entities across the government, following open standard, web based technology with fit-for-purpose technology for e-Authentication and encryption	Annual procurement plan, e-Advertisement, centralized bidders registration, e-bidding supporting all procurement methods prescribed by public procurement act and rules, e-evaluation, e-contract award, e-Contract management, e-invoicing with comprehensive e-PMIS and e-Audit trails under process workflow.
Karnataka, India	BOO model, Transparency, efficiency, competition	State-wide implementation, Operated by private party, revenue sharing, open standard, PKI based encryption, web based	e-Advertisement, e-bidding (open tendering, framework agreements, auctions), contract management
Malaysia	BOO model, Efficiency,	Single Portal, uses digital certificates, category based registration and fee charging, multi-buyer, multi-supplier	Procurement plan, e-Quotation, e-Bidding, Central Contract, e-Catalogue, Direct purchase, e-Reverse Auction
Nepal	Government operated, Transparency, competition	National portal for all public agencies, password based authentication, web based.	Annual procurement plan, e-Advertisement, e-bid preparation, e-Submission, e-Contract notice, e-PMIS, Standard bidding documents, workflow
UK <sup>3</sup>	Transparency Efficiency	Multiple systems, open standards, web based, multiple buyer / supplier entities	Procurement Plans, E-advertising, E-bidding, E-quoting Management information systems
Portugal <sup>12</sup>	Efficiency, Transparency	Single national system with central agency and decentralised buying	E-advertising E-bidding, E-quoting, E-tenders E-auctions

<sup>12</sup> Additional examples of benefits in the EU are shown in the Annex - Business Case

			E-framework agreements
Chile	Transparency Efficiency Competition	Single National unitary system, with separate FMIS interface, open standards, web based, multiple buyer / supplier entities	E-advertising E-bidding, E-quoting, E-purchasing Integrated PMIS for workflow management, control and analyses, Contract management
India (Andhra Pradesh State government)	Transparency Efficiency Development	Single unitary system in each State, with separate FMIS interface, open standards, web based, multiple buyer / supplier entities	E-advertising E-bidding, E-quoting, E-purchasing Integrated PMIS for workflow management, control and analyses
Kazakhstan	Efficiency	Single National unitary system, with separate FMIS interface, partly developed, multiple buyer / supplier entities	Procurement Plan, E-Quoting E-Bidding E-R/Auctions Integrated PMIS for workflow management, control and analyses
Korea	Transparency Efficiency Economic development Policy development	Single national unitary system, with separate FMIS interface, open standards, web based, PKI Based, Centralized Procurement, multiple buyer / supplier entities	E-advertising E-bidding, E-quoting, E-R/Auctions E-purchasing Integrated PMIS for workflow management, control and analyses, Integration with other supporting government systems
Singapore	Efficiency Compliance Competition	Single national unitary system, with separate FMIS interface, open standards, web based, multiple buyer / supplier entities	E-advertising E-bidding, E-quoting, E-purchasing Integrated PMIS for workflow management, control and analyses

65 European Union (EU) procurement policies have been primarily focussed on cross-border trade but this concern has been handicapped by a lack of technical and management interoperability standards between states, while at the national level e-Procurement has often been a relatively low national priority. Other problems have included early UNCITRAL signature law, which complicated entry/participation requirements for economic operators. The UNCITRAL model has since been substantially amended but individual State policies and systems have not.

66 **Bangladesh** has from 2011 been implementing one of the most comprehensive end-to-end e-Procurement system in the world, covering all the procurement methods as prescribed in the public procurement act and regulations. Over a very short time, it has gained wide user adoption in the government and private sector. The system is operated by the government but outsourcing its operation and maintenance functions. The Bangladesh government commenced its pilot implementation from four nominated (lead) target agencies from Roads and Highways, Local government, Rural Electrification, and Water Development sectors.

67 **Malaysia** started its ePeroleham e-Procurement system in the year of 2000 in Build-Own-Operate (BOO) model with a private company but regulated by the Finance Ministry. It covers selected procurement methods like quotation, open tendering, direct purchase from catalogues, and reverse auctions. Seventy-five (75%) of the public agencies have adopted the system<sup>13</sup>.

68 Many of the states in **India** have got their own state-wide e-Procurement system having very similar functionalities. BOO is the common model applied in India with an exception of a failed case of BOO in Andhra Pradesh.

69 **South Korea** e-Procurement implementation is one of the successful e-Procurements, having interfaced with other government systems. The e-Procurement system is based on the principle of centralized procurement. Most of the procurement processes are fully automated.

### *Lessons*

70 A key lesson from all national developments is that e-Procurement is not simply a software application, and approaching it in those terms will not lead to a successful outcome. It is rare for a system of e-Procurement that has been developed for one jurisdiction to be successfully adopted unchanged by another.

71 An e-procurement initiative can learn from the successes and failures of international experiences.

#### *Key Learning – Technical integration and managing technical standards are critical*

72 E-procurement is a strategic programme and a good business design is vital. Technical tools are not sufficient to ensure success. Succinctly, e-Procurement is not a technical solution but an end-to-end business solution.

73 International experiences in relation to some of the operational issues have included the following:

- i. One of the most contentious areas of application is in relation to fees and charges applied in the e-procurement system. It is common in some countries for fees to be attached to online registration, downloading of bidding documents, and digital certificates. In these cases the preferred position is for document download to incur no charge while bid submission may incur a fee – this is a superior approach because it does not weaken transparency (anyone can access the bid documents for no charge), and it probably does not inhibit competition, recognising that suppliers incur costs for paper bid submissions regardless.
- ii. In the example of Kazakhstan there is a policy for accelerating e-procurement rollout and so registration is free, and fee for digital signature is also free as are all of the processes – this is the preferred approach, especially where e-procurement is new to a jurisdiction.
- iii. A further issue is when the government keeps the door open to paper bids even while it is implementing e-procurement. This is a two edged

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<sup>13</sup> <http://eeiplatform.com/11806/malaysias-e-procurement-portal-shoots-to-5-3b-transactions-in-2013/>

requirement. It addresses the need for suppliers to adjust and also addresses circumstances where connectivity is weak. However it also slows the rate of take-up of the systems and can defeat the purpose of promoting e-procurement. It is **recommended** that this practice have a finite life.

- iv. A common problem is in relation to digital certificates. The issuance of digital certificates is a potential weakness in the Public Key Infrastructure (PKI) framework. There is a commercial relationship between the digital certificate provider and the government provider. Governments usually want some strong standards around the provision of digital certificates, such that they often like to license these players. This licensing is always at a domestic level. This means that a potential offshore supplier to government may need to travel to the country to get a certificate. This can be required each year, and clearly represents a potential barrier to competition. Also, this is not acceptable under MDB guidelines. Superior approaches are now available.
- v. In the case of Russia, Belarus and Kazakhstan there is an agreement that the e-procurement system operate seamlessly between all members of the Custom Union, while there is a similar requirement for members within the EU. One approach is for the member states of these market entities to adopt a policy of mutual recognition, such that a government provider who has a digital certificate from one jurisdiction automatically has recognition in all member states, without need to re-register. An alternative solution is for reputable international commercial certification authorities also be recognised. New developments are underway, for example based on biometrics
- vi. Some e-Procurement developments do not have good quality disaster recovery / backup, which means that there may be non-compliance with track-ability conditions for good practice both in e-bidding and in e-reverse auctions.
- vii. In some instances e-Procurement has not proceeded in a coordinated fashion across a government but is fragmented between ministries or departments. A centralised coordinated approach is greatly superior in terms of cost, efficiency and interoperability. For example fragmentation multiplies security costs and weaknesses, and also requires suppliers to deal with multiple sites. A unitary infrastructure for all government entities is to be strongly preferred. Sometimes it is claimed that this conflicts with decentralisation policies: this is not correct – e-Procurement is a technical and management infrastructure and does not imply centralised procurement as further discussed below.

74 Where third party service providers host the system, there may need to be audits undertaken of the provider. The scope for the government to undertake this, or to receive independent audit reports, must be part of the service agreement. For example from 1999-2002 a comprehensive e-bidding system operated by the government of Western Australia provided an online bidding service to the Leeds government in the UK – this was the first ‘Cloud’-like e-procurement service provided internationally. The UK Leeds government auditor gained access to all audits of the system undertaken by the government of Western Australia.

*Key Learning – Servicing e-Procurement requires skilled resources*

75 E-procurement system development requires a multi-functional team that can

- i. Understand public procurement policies and practices
- ii. Benchmark and re-engineer business processes
- iii. Understand business requirements and the technical capabilities
- iv. Coordinate change management
- v. Develop training programmes

*Key Learning – Government procurement differs from that in private corporations*

76 Financial packages (FMIS) in ERP solutions often include components marketed as ‘e-Procurement’. However these often have their origins in private industry supply lines and are usually a poor fit for government requirements without expensive customisation and even more expensive upgrades when new versions of the FMIS appear. Most of such financial systems used in Ministries of Finance cover recording requisitions from the public agencies, allocating budgets for the public agencies, and also payment release requests and payment transactions to suppliers. The whole block of processes required for transparency, competition, equity, efficiency and compliance to the procurement processes and practices as prescribed in the procurement laws and regulations are missing in such financial packages. It lacks interactivity with the public agencies and bidders as well as interactions with numerous other users involved in the procurement process.

*Key Learning – Effective strategies can improve supplier and buyer adoption*

77 These strategies should:

- i. Support government and business priorities
- ii. Provide online access for Framework Agreements
- iii. Integrate with agencies existing FMIS
- iv. Provide meaningful integration with business activities
- v. Ensure systems are user-friendly
- vi. An effective communications plan.

*Key Learning – Flexibility in process development and support structures can improve outcomes*

78 E-procurement is a technical implementation that enables the transformation of organisation structures and practices. Flexibility in the development and enablement of the systems and processes allows diverse requirements of stakeholders to be recognised and supported.

*Common Issues and Questions*

79 Considerations for implementation have included:

- i. Will the government endorse, empower and resource a lead agency to implement e-Procurement? *This should be considered in terms of the Institutional arrangements for procurement in the government.*
- ii. What expertise / professional development is required and from where will this come, and how will this be maintained?
- iii. Does e-Procurement mean centralisation of procurement?
- iv. Does e-Procurement belong as part of the Financial Management Information System?
- v. Should the e-Procurement system be acquired as an off-the-shelf system?
- vi. What will the system cost to install and maintain and can this be justified? *See Business Case for e-Procurement.*
- vii. Should a paper-based system be maintained in parallel to the e-Procurement system?
- viii. Should the e-Procurement system interoperate with the tax system and other such systems in government?
- ix. Who should arrange for training for e-Procurement and what does this involve?
- x. Is new legislation required?
- xi. What are the security risks?

These questions will be addressed in the course of this strategy and implementation plan.

### 3. READINESS - CHALLENGES AND GAPS

80 An e-Procurement Readiness Assessment and a Procurement Performance Benchmark Study were undertaken in consultation with the PPRAs to identify the enablers for e-Procurement in Pakistan. The MDB e-Procurement Readiness Assessment Survey Questionnaire was updated to capture the Pakistan country context. Respondents from procuring entities, the bidding community, private sector associations, government oversight and regulatory agencies and other stakeholders participated in the survey. Other key stakeholders (PDEs, Ministries, professional associations, Internet and other service providers, oversight agencies, etc.) were consulted face-to-face.

81 The e-Procurement Readiness Assessment identifies nine key components (Table 2) for e-procurement readiness as follows:

**Table 2: Readiness Components**

STRATEGIC FOUNDATIONS	COMPONENTS
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Institutional Capacity ( <b>the capacity for government to set directions and lead and resource the changes required</b> ).	1. Government or Institutional Leadership ( <b>vision, sponsorship, resources, stakeholder support and implementation support</b> ). 2. Human Resource Management ( <b>education, skills development, expertise and career paths</b> ).
Governance ( <b>establishing the rules, management support, performance monitoring and evaluation to support e-Procurement</b> ).	3. Planning and Management ( <b>strategic planning and re-engineering of management protocols, business rules and processes</b> ). 4. Policy ( <b>setting intent and guidelines that can be consistently applied</b> ). 5. Legislation and Regulation ( <b>supporting rules and the external and internal monitoring of the efficiency, performance and compliance</b> ).
Business Functionality and Standards ( <b>sustainable infrastructure, support services and common standards to ensure accessible, integrated and consistent procurement services can be established</b> ).	6. Infrastructure and Web Services ( <b>reasonable access to, and quality of e-services and their sustainable development</b> ). 7. Standards ( <b>management, procurement and technical standards to ensure consistency of the approach to e-Procurement and interoperability across the systems involved</b> ).
Third Party Involvement ( <b>ensuring the private sector is enabled to participate and be involved in e-Procurement</b> ).	8. Private Sector Integration ( <b>suppliers are enabled and have incentives to participate in e-Procurement</b> ).
Application of Technology ( <b>appropriate, integrated, sustainable and modifiable technology is phased in to provide tendering, contract management and purchasing services</b> ).	9. Systems ( <b>the planning, selection, development, implementation and support of e-procurement systems</b> ).

It is essential to appreciate that key issues within these aspects must be addressed regardless of how e-procurement is developed or acquired.

82 From discussions with Government officials and other stakeholders in Pakistan, numerous observations were made. Much of this other feedback related to the transparency objective of e-procurement.

### ***1. Government Leadership & Institutional Arrangements***

83 Almost all international experience is that the foremost essential element for e-Procurement implementation is government leadership, commitment and the establishment of required institutional arrangements including a vision and



objectives for e-Procurement, and authorisation and resourcing of the implementing lead agency to drive the required changes.

- i. In Pakistan there is significant interest in e-Procurement development by businesses, and Government administration: a lack of transparency and corruption are perceived as major issues and threat to implementation of any reform agenda. The National Procurement Strategy (2013-16) endeavours to lay down a roadmap for procurement regulators in Pakistan to realize the efficiency and transparency objectives and principles of public procurement. However, this policy statement needs to be articulated more effectively at political level to clearly highlight need for introducing e-Procurement as a strategic driver for the procurement reform initiative. The Federal Government in general supports e-Procurement reform as one of the major drivers in its National procurement strategy. The Federal Ministry of Finance and PPRA were keen to support the introduction of e-Procurement at the Federal level. There is already a low level recognition and implementation of elements of e-procurement in procurement regulations and to a lesser extent in procurement practices.
- ii. Sindh PPRA and Government of Sindh have already endorsed the draft National procurement strategy circulated by the Federal PPRA, which reflect that there is high acceptance of the need for e-procurement reform in Sindh.
- iii. The Federal PPRA maintains an e-portal, and an interest in online self-paced training for the private sector, and is building a complaints database. The PPRA also is maintaining an online blacklist. There are procurement portals at the provincial levels with similar functionality.
- iv. Sindh IT Department has taken many small-scale initiatives towards introducing e-government in Sindh. However, one of its earlier initiative on e-Procurement software development was shelved due to lack of interest by respective departments.
- v. Punjab province is working on an overall governance reform agenda including measures to enhance procurement transparency using simple technological innovations. However, PPRA Punjab is not well resourced and there is need for staff and technology support. Similar to Sindh and Federal PPRA, the Punjab PPRA has also succeeded in making its presence felt at administrative level and queries and summaries being routed through the PPRA before finalization of procurement decisions by respective agencies.

84 Based on the readiness of individual Provinces and for the efficient use of resources and avoiding duplication of costs, it is **recommended** that a common Unitary e-Procurement Infrastructure be established. Separate developments of e-procurement within individual provinces, or individual ministries or departments fragment the opportunities. Fragmented development increases costs and raises risks that systems would not be interoperable or would not have common core data capture that would enable proper performance assessments and financial integration. Fragmentation also exacerbates security risks.

85 **Common Unitary e-Procurement Infrastructure** is sometimes presumed to represent the centralisation of procurement but this is not the case. It represents a unified information infrastructure for procurement rather than centralisation of procurement itself. Individual entities and levels of government can remain fully responsible and in control of what they buy, what contracts they adopt, how much they buy and when they buy it – procurement remains decentralised but is utilising a common infrastructure or tool, just as it utilises other common national infrastructures for commerce such as the national procurement laws, and national banking systems.

86 **The Common Unitary e-Procurement Infrastructure** refers to the establishment of a single Primary Data Centre and Disaster Recovery Centre. An e-Procurement Software Solution should be procured with licensing arrangements such that the e-Procurement System database can be separately clustered for individual provinces. It should also provide for separate user interfaces, separate procurement processes and practices based on the individual federal and provincial authorities, but still having provision of interoperability and information exchange facilities across the provincial and federal portals. This arrangement provides the facility of independent administration and operation of the federal and provincial e-Procurement systems by respective federal and provincial authorities.

**Table 3**  
**Government Leadership and Institutional Arrangements**

SUBCOMPONENTS	FINDINGS			
The degree to which	Y	P	N	NR
a) A Federal/Provincial strategy or any other public commitment to modernise public procurement and/or adopt e-Procurement is in place.	9	19	5	3
b) The government has nominated a high level authority to be responsible for driving procurement modernisation and change.	16	9	6	5
c) There is a lead agency for procurement that has high level procurement policy, legislative, technical and management expertise and knowledge.	18	12	4	2
d) The lead agency for public procurement (where it exists) is adequately resourced to carry out its functions	5	21	6	4
e) The lead agency responsible for public procurement has an effective working relationship with the Ministry responsible for technology and e-government.	10	11	10	5
f) A government lead agency is responsible for managing the development and implementation of the e-Procurement system.	11	5	14	6
g) The lead agency has the resources to provide for the development, implementation and operation of an e-procurement system.	6	9	17	4

**Legend:** Y=Yes fully agree; P=Partially agree; N=Disagree, NR=No responses. Scores show numbers of responses across all those surveyed.

87 Feedback shown in Table 3 for the leadership role suggests that there is reasonable recognition of the authority and roles of the procurement regulatory agencies but this should be strengthened, but also that these are not well resourced, and that there is not currently a high priority reform program.

88 To lead an e-procurement strategy there needs to be a capacity to arrange interdepartmental committees to develop various aspects such as business process re-engineering.

89 In order to implement e-Procurement reform at Federal and Provincial levels, it is **recommended** that the lead role be assigned to relevant PPRAs. If a National approach is adopted, the Federal PPRA can lead the coordination. It would be desirable for this program and institutional arrangement to be sanctioned with a public statement from the Federal Government<sup>14</sup> with the objectives of:

- i. Ensuring transparency for all stakeholders;
- ii. Reducing bureaucracy and improving efficiency of the government;
- iii. Creating significant efficiencies and savings for businesses;
- iv. Strengthening trust in government business dealings and improving the investment climate in the country;
- v. Mandating a government-wide framework for e-Procurement including an integrated system;
- vi. Implementing e-Procurement operating and systems policies.

90 The PPRA should be accountable for undertaking the management and implementation of the programme. It would be highly undesirable for e-procurement to be implemented by individual line agencies, or by an IT department – e-procurement is mostly about procurement rather than 'e' or a pure IT intervention. It is **recommended** that a lead agency is agreed in consultation among the federal and provincial PPRAs. The lead agency for the e-Procurement system must be able to lead procurement reform, procurement policy and direct the development of Business Process Re-engineering (BPR) and new methods for procurement that are enabled by e-Procurement.

91 It is also desirable and **recommended** that the government signal its commitment to e-Procurement resolution publically, and to set a timeframe for a comprehensive e-Procurement system to be operational. Key performance outcomes from this policy should also be signalled such as in relation to targeted savings and transparency.

## ***2. Human Resources***

92 In jurisdictions that have successfully adopted e-Procurement, there have usually been significant government efforts to make provision for the education and training of executives, managers and staff with procurement responsibilities. Education and training should also target suppliers. Table 4 below identifies the sub components involved.

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<sup>14</sup> Individual Ministerial authority is insufficient. The e-Procurement programme represents a whole-of-government strategy that cuts across all Ministerial portfolios.

**Table 4**  
**Human Resource Management**

SUB-COMPONENTS	FINDINGS			
The degree to which	Y	P	N	NR
a) There is an agency or function responsible for human resource management issues in relation to procurement.	11	13	11	1
b) An education and training program for executives, managers and staff in strategic and operational procurement is in place	10	18	8	0
c) Education and training related to government procurement is available to suppliers	6	9	21	0
d) The range of expertise required to plan and implement a strategic implementation plan for e-Procurement is available to government.	7	12	15	2
e) Actions have been taken to review the jobs and responsibilities of procurement staff to ensure a viable career structure is in place and that modernisation issues can be addressed.	6	9	19	2
f) Procurement personnel in the procuring agency are adequately skilled to operate computer.	18	12	5	1
g) Procurement personnel are receptive of required changes from manual to electronic procurement.	10	16	9	1

**Legend: Y=Yes fully agree; P=Partially agree; N=Disagree, NR=No responses. Scores show numbers of responses across all those surveyed.**

93 The survey feedback shown in Table 4 suggests that there is a reasonable-to-good level of IT literacy in government, and that staff preparedness for change is moderate, confirming that the strategy for e-procurement will need to be phased and lead by individual champions, and this will be **recommended** in the implementation plan. Training programs are available for the government sector but little for suppliers – this will also require attention and will be addressed in the implementation plan. There is a low level awareness of the training requirements for this initiative, and ownership of a training strategy is not well defined. In most country experiences, training is a crucial component of e-Procurement implementation, both for the various layers of government and for the private sector. However, both the public and private sectors have a reasonable or high degree of e-literacy and it is considered that this is not expected to be a major issue. Nevertheless it will be addressed further in the implementation plan.

94 It is **recommended** that the training and education programmes should be conducted for the bidding community as well as government procurement personnel.

95 It is also **recommended** that consideration be given to setting up an e-Procurement unit with the appropriate set of skills and expertise in each of the PPRAs for the implementation of the e-Procurement System.

### 3. Planning and Management

96 Planning and management of procurement are governed by consistent legislation, standard bidding documents, and standard processes apply generally. These features will make the BPR for e-Procurement a relatively efficient process. There is less confidence that the procurement processes are well managed in the buying entities, and there is little or no spend analysis undertaken on a whole of government basis. Procurement regulatory compliance including procurement planning is considered weak, partly because there is not a strong ownership of the processes.

**Table 5**  
**Planning and Management**

SUBCOMPONENTS	FINDINGS			
The degree to which	Y	P	N	NR
1. A plan that sets deadlines, responsibilities and financing for the development of government procurement including e-procurement at the Federal and Provincial level is available.	5	11	14	6
2. Any available plan for e-procurement has the support and involvement of key public sector, business and community stakeholders.	3	9	19	5
3. Clear procurement guidelines and procedures are well documented and easily available to government agencies and suppliers.	24	9	1	1
4. The procurement procedures and guidelines are consistently applied across government agencies.	25	8	2	1
5. Specialised procurement processes are developed for specialised goods, aggregated buying, common goods and/or major capital assets.	16	10	8	2
6. Standardised and simplified bidding documents (SBD) or templates are available to support the procurement process.	22	8	5	1
7. Preparation of each Annual Procurement Plan (APP) is annually prepared by the Procurement Agencies and published in a website or in gazette to inform public and bidding community.	11	18	5	2
8. Contract outcomes relating to service delivery and product/service quality are well managed and reported.	5	17	11	3
9. Consolidated procurement data on usage, trends, and performance is available to assist government budgeting and decision-making.	11	9	14	2
10. Management controls for monitoring compliance, probity, quality, risk management, efficiency and the performance of the procurement process in all government agencies are in place.	10	13	12	1

**Legend: Y=Yes fully agree; P=Partially agree; N=Disagree, NR=No responses. Scores show numbers of responses across all those surveyed.**

97 From the survey responses (Table 5), there is no generally recognised pre-existing e-procurement strategy, and no institutional structures have been proposed to drive such a programme. In this case the vision and objectives have not been articulated, and the scope of e-Procurement is not well understood by several key stakeholders, although several lead agencies (PPRA) have a good level of interest in its key aspects. There is however, strong recognition of the lead regulatory roles, which it is **recommended**, be developed to include e-procurement implementation.

98 The benchmark study revealed that there is a clear lack of Procurement-related data collection, processing, analysis and management. This directly impacts on the budgeting, planning and monitoring of procurement activities.

#### 4. Policy

99 The development of policy gives important direction to the procurement environment and its transformation. Policy should include issues such as value for money, open competition, risk management, local business, economic development, public procurement performance, and integrity and ethics. It should also be applied to the development of e-procurement systems and their interfaces to other corporate systems. A policy driven approach to procurement gives broad direction as to what outcomes government procurement should achieve without over specifying how it is done.

**Table 6**  
**Policy / Regulation**

SUBCOMPONENTS	FINDINGS			
The degree to which	Y	P	N	NR
a) Procurement policies have been developed to achieve a range of outcomes in government procurement including 1) to 4):				
1) effectiveness of government procurement (e.g. value for money and transparency).	22	10	4	0
2) the purchase of specific goods and services (e.g. IT goods and services, environmental sustainability)	16	11	8	1
3) business efficiency and development, small business issues, and regional development	8	14	10	4
4) development of e-government services using open architecture and open common standards.	5	11	17	3
b) A procurement policy entity is available that has authority to recommend changes	24	6	2	4
c) Procurement policy is linked to policies on e-Commerce, e-Government and industry development.	7	6	19	4
d) Procurement policies are focussed on performance and outcomes rather than procedures	7	11	16	2

**Legend: Y=Yes fully agree; P=Partially agree; N=Disagree, NR=No responses. Scores show numbers of responses across all those surveyed.**

100 The survey responses (Table 6) indicate weak business orientation of public procurement, and a lack of any policy on e-procurement. A set of policies will be required to accompany e-Procurement, and should be developed by the PPRA for the operations of the systems. These policies should be documented in e-Procurement guidelines. These are outlined in the implementation plan.

101 As noted above, one of the key policy issues is procurement centralization or decentralization.

102 A policy issue often arises in the unitary nature of the preferred e-procurement strategies. It is **recommended** that the e-Procurement strategy envisage a Common Unitary e-Procurement Infrastructure (explained earlier), which provides centralized infrastructure with decentralized procurement operation and service delivery of federal and provincial governments. This approach also makes better use of the technology and particularly minimises duplicating security management, catalogue management, duplicate supplier registries, etc, and interoperability issues. It also ensures a single sign-on for suppliers across provincial and federal e-Procurement portals, and therefore greater supplier efficiencies. Such an arrangement does not affect the decentralisation of procurement, which remains fully decentralised.

## **5. Legislation**

103 Existing legislation in Pakistan is adequate and supportive of e-procurement, notwithstanding some issues that should be amended, as noted in following sections. Government of Pakistan adopted its IT Policy in the year 2000 after studying UNCITRAL model laws, looking at various legislation of both Civil and Common law countries, reviewing different implementation schemes of electronic authentication, regulatory models and best practice guidelines and appreciating the common three approaches being followed around the world, that followed the “International Consensus Principals on Electronic Authentication” designed by Internet Law and Policy Forum and “two-tier” approach.

104 At present, barring certain exceptions, all filings/transactions (e.g., tax returns, payments, cheques, banking instructions, custom documents, employment applications, court documents, fee payments, academic transcripts, complaints etc. etc.) are authenticated by signatures on paper, which can then be used as evidence as needed. Electronic transaction, in replacement of or in parallel within this system in vogue, required the backing of law so that the electronic records and digital signatures are acceptable in the eye of law. Electronic Transaction Ordinance 2002 (ETO) was promulgated on September 11, 2002.

105 Laws on data protection, cybercrime and electronic fund transfers are being debated in legislative forums. Document reviews have been conducted including the following:

- a. Electronic Data Protection Act 2005
- b. Electronic Transactions Ordinance, 2002
- c. E-procurement – The Pakistani Legislative Environment; Zahid Jamil, Zahra Rose Dean 2013 with Annexure C
- d. Factors influencing e-government adoption in Pakistan, Transforming Government: People, Process and Policy; Mariam Rehman, Vatcharaporn Esichaikul, Muhammad Kamal, (2012) , Vol. 6 Iss: 3, pp.258 - 282

- e. Payment Systems and Electronic Funds Transfer Act, 2007
- f. Public Procurement Regulatory Authority Ordinance, 2002
- g. Public Procurement Rules, 2004
- h. Public Procurement Regulations, 2008
- i. Public Procurement Regulations for Procurement of Consultancy Services Regulations, 2010
- j. Public Procurement Regulatory Authority Guidelines (5-10-2002 to 21<sup>st</sup> April, 2011)
- k. Punjab Procurement Regulatory Authority Act, 2009
- l. Punjab Procurement Rules, 2009
- m. Sindh Public Procurement Act, 2009
- n. Sindh Public Procurement Rules, 2010 (SPPR)
- o. Sindh Procurement Regulations (WORKS) 2011
- p. Sindh Public Procurement Rules Amendments 2013

106 At a concept level, e-procurement requires only that electronic documents and electronic signatures have equivalent legal status. It is notable, as concluded in the thorough WB review of the legislation, that nothing in existing law obstructs significant e-procurement implementation, and indeed the law generally facilitates this development. The consultants concur with this conclusion. That review also notes some amendments, mainly by way of clarifications, but a great deal can be done within the existing situation and indeed the legal situation is significantly better than in some other countries that have achieved significant milestones.

107 The Electronic Transactions Ordinance (2002) avoids the mistake of numerous other jurisdictions of mandating or implying a PKI Digital Signature regime. Instead the Ordinance maintains an open position and acceptance of signatures of any type depending only on the use to which these are being put. With the option to adopt a better fit-for-purpose authentication technological method, e-procurement is likely to be able to be implemented more rapidly, be more secure, gain more credibility, and be undertaken at a lower cost than if the PKI approach were to be adopted.

108 There is an existing e-Procurement Web Portal with each of the PPRAs, and the use of online technology for procurement publication and announcements is reflected in the legislation or regulation of each of the regulators.

109 “In conclusion, the analysis broadly speaking, suggests that the present legal framework with respect to the enabling provisions of the ETO and the status of other legislation in Pakistan does not create an insurmountable obstacle and in fact enables the delivery of e-government services, electronic transactions and undertaking e-procurement. Without undermining the ability of procurement agencies to be able to enable implement e-procurement, we would recommend that certain aspects of subordinate legislation identified in the recommendations be addressed through appropriate amendments as abundant caution and by way of ensuring greater clarity and certainty in the procurement process”.

### ***Validity***

110 A question arose during consultations about the currency of the Electronic Transactions Ordinance (2002), with some opinion that it had expired. This was investigated and found not to be the case – the Ordinance (2002) continues to apply.



111 By virtue of Article 270AA of the Constitution of Pakistan the ETO 2002 shall remain in force until altered, repealed or amended by competent Authority. A detailed explanation of Article 270 AA of the Constitution of Pakistan is attached as an annexure-. Also received was the legal opinion of M/s Ordignnam Law associates and confirmed by the Ministry of Law that the ETO 2002 is still in force and has not been amended by competent authority.

112 Article 270AA. Declaration and continuance of laws etc.---

(1) The Proclamation of Emergency of the fourteenth day of October, 1999, the Provisional Constitution Order No.1 of 1999, the Oath of Office (Judges) Order, 2000 (No.1" of2000), Chief Executive's Order No. 12 of 2002, Chief Executive's Order No. 19 of 2002, the amendments made in the Constitution through the Legal Framework Order, 2002 (Chief Executive's Order No. 24 of 2002), the Legal Framework (Amendment) Order, 2002 (Chief Executive's Order No. 29 of 2002) and the Legal Framework (Second Amendment) Order, 2002 (Chief Executive's Order No. 32 of 2002), notwithstanding any judgment of any court including the Supreme Court or a High Court, are hereby declared as having been made without lawful authority and of no legal effect.

(2) Except as provided in clause (1) and subject to the provisions of the Constitution (Eighteenth Amendment) Act, 2010, all other laws including President's Orders, Acts, Ordinances, Chief Executive's Orders, regulations, enactments, notifications, rules, orders or bye-laws made between the twelfth day of October, one thousand nine hundred and ninety-nine and the thirty-first day of October, two thousand and three (both days inclusive) and still in force shall, continue to be in force until altered, repealed or amended by the competent authority.

*Explanation.-* For the purposes of clause (2) 'and clause (6), "competent authority" means,---

(a) in respect of Presidents' Orders, Ordinances, Chief Executive's Orders and all other laws, the appropriate Legislature; and

(b) in respect of notifications, rules, orders and bye-laws, the authority in which the power to make, alter, repeal or amend the same vests under the law.

(3) Notwithstanding anything contained in the Constitution or clause (1), or judgment of any court including the Supreme Court or a High Court,---

(a) Judges of the Supreme Court, High Courts and Federal Shariat Court who were holding the office of a Judge or were appointed as such, and had taken oath under the Oath of Office (Judges) Order, 2000, (I of 2000), shall be deemed to have continued to hold the office as a Judge or to have been appointed as such, as the case may be, under the Constitution, and such continuance or appointment, shall have effect accordingly.

(b) Judges of the Supreme Court, High Courts and Federal Shariat Court who not having been given or taken oath under the Oath of Office of

(Judges) Order, 2000 (I of 2000), and ceased to hold the office of a Judge shall, for the purposes of pensionary benefits only, be deemed to have continued to hold office under the Constitution till their date of superannuation.

(4) All orders made, proceedings taken, appointments made, including secondments and deputations, and acts done by any authority, or by any person which were made, taken or done, or purported to have been made, taken or done, between the twelfth day of October, one thousand nine hundred and ninety-nine and the thirty first day of December, two thousand and three (both inclusive), in exercise of the powers derived from any authority or laws mentioned in clause (2), or in execution of or in compliance with any orders made or sentences passed by any authority in the exercise or purported exercise of powers as aforesaid, shall, notwithstanding anything contained in clause (1), be deemed to be valid and shall not be called in question in any court or forum on any ground whatsoever.

(5) No suit, prosecution or other legal proceedings, including writ petitions, shall lie in any court or forum against any authority or any person, for or on account of or in respect of any order made, proceedings taken or act done whether in the exercise or purported exercise of the powers referred to in clause (2) or clause (4) or in execution of or in compliance with orders made or sentences passed in exercise or purported exercise of such powers.

(6) Notwithstanding omission of the Concurrent Legislative List by the Constitution (Eighteenth Amendment) Act, 2010, all laws with respect to any of the matters enumerated in the said List (including Ordinances, Orders, rules, bye-laws, regulations and notifications and other legal instruments having the force of law) in force in Pakistan or any part thereof, or having extra-territorial operation, immediately before the commencement of the Constitution (Eighteenth Amendment) Act, 2010, shall continue to remain in force until altered, repealed or amended by the competent authority.

(7) Notwithstanding anything contained in the Constitution, all taxes and fees levied under any law in force immediately before the commencement of the Constitution (Eighteenth Amendment) Act, 2010, shall continue to be levied until they are varied or abolished by an Act of the appropriate legislature.

(8) On the omission of the Concurrent Legislative List, the process of devolution of the matters mentioned in the said List to the Provinces shall be completed by the thirtieth day of June, two thousand and eleven.

(9) For purposes of the devolution process under clause (8), the Federal Government shall constitute an Implementation Commission as it may deem fit within fifteen days of the commencement of the Constitution (Eighteenth Amendment) Act, 2010.

Additional notes to the above are included in Annex 2.

113 **Recommendation:** The e-Procurement system should avoid the requirement of specific digital certificates and PKI for authentication, and should apply an alternative solution such as set out in the implementation plan. For additional discussion of this issue, see Annex 3.

114 Survey responses do not strongly perceive the legislation to be an obstruction to e-procurement, as shown in Table 7, although there appears to be considerable uncertainty in relation to what roles and responsibilities and authorities do exist. Despite this, there is a consistent but incorrect perception that there is no legislative basis for e-procurement, and that the Ordinance of 2002 is insufficient or expired. There continues to be a belief, also incorrect, that written signatures are mandatory in contracting.

**Table 7**  
**Legislation**

SUBCOMPONENTS	FINDINGS			
	Y	P	N	NR
The degree to which				
a) Existing procurement legislation is perceived by users to obstruct the use of internet-based e-procurement.	7	9	14	6
b) Specific legislation exists to link procurement law and practice with the requirements of international trade agreements.	11	8	6	11
c) The procurement regulatory agencies have clear, enforceable powers to regulate procurement policy, legislation and processes.	16	12	6	2
d) The regulator(s) is sufficiently resourced to carry out its role.	11	20	2	3
e) The government has comprehensive procurement information to assist the management of its procurement function.	14	13	6	3
f) The government has given an agency responsibility for setting standards for the national and international operation of the procurement function (eg catalogue item codes).	17	6	9	4

**Legend: Y=Yes fully agree; P=Partially agree; N=Disagree, NR=No responses. Scores show numbers of responses across all those surveyed.**

115 Despite the mixed perceptions in Table 7, existing legislation in Pakistan for procurement and e-commerce is adequate for e-Procurement, notwithstanding some issues that should be addressed, as noted. The primary procurement law under each PPRA explicitly recognises e-procurement. Any new arrangements in procurement processes, practices, use of specific technology, engagement of relevant stakeholders as e-Procurement users, which derived from the Business Process Reengineering (BPR) for the e-Procurement and that leverage the benefits of technology, should be documented in the e-Procurement guidelines.

116 To the basic requirements relating to e-documents and e-signatures, a number of other legislative reforms are sometimes identified including for the following areas:

- i. Electronic records management;

- ii. Consumer protection and privacy;
- iii. Laws pertaining to legal evidence;
- iv. Data protection and confidentiality;
- v. Intellectual property, copyright;
- vi. Codes of practice.

117 However, these areas are generally not pre-requisites for the application of e-Procurement. Overall, the existing legislation in Pakistan is broadly able to facilitate e-procurement. This is discussed more fully in Part II below.

## ***6. Infrastructure and Web Service***

118 Pakistan has coverage of network infrastructure with good accessibility that is quite adequate to support most functions of e-procurement. This coverage is inclusive of major cities and the regional centres and is considered to be affordable. The Public sector departments in Pakistan are currently not well equipped with storage capacity, backup or disaster recovery except for some specific applications. Nevertheless there may be adequate unused capacity in data centres such as in PITB Lahore that needs further investigation. Table 8 shows survey results.

- i. Within the private sector, there is extensive capability amongst larger businesses in the use of computers in their businesses, and showed enthusiasm for the introduction of e-procurement. This is inconsistent with perceptions of some government officials, who often consider the private sector to be unprepared, but quite consistent with experiences in many other countries.
- ii. There are 8-10 Internet providers in country. Download speed is about 3 mbps and uploading up to 1 mbps and PTCL DSL based Wi-Fi charges range in between Rs. 2000-2500 per month. Recently, 3G/4G mobile based Internet data technology has been introduced in Pakistan with high-speed Internet connectivity and data transfer option, which will facilitate the cost effective use of the technology in mobile devices as well as in business applications in cities as well as remote areas of the country. This will especially empower the SMEs to access e-Procurement opportunities on their mobiles and computer systems.
- iii. Fibre optic cable is available across Pakistan and even in remote rural areas these days. Internet cafes have opened in private sector and also by government in remote areas as part of IT literacy initiative by provincial governments.

119 Available software expertise is also adequate to provide domestic support for the operations and management, and the system development itself.. There is only limited guidance available in relation to interoperability standards and risk management of applications development.

**Table 8**  
**Infrastructure and Web Services**

SUBCOMPONENTS	FINDINGS			
The degree to which	Y	P	N	N R
a) Internet networks are in place that can service major city users.	29	5	2	
b) Internet networks (perhaps via kiosks or internet centres) are in place that can service users from away from major cities.	20	12	4	
c) Buyers and suppliers have reasonable access to Internet	25	8	3	
d) Available bandwidth is sufficient to provide internet service at sufficient quality and speed to support e-Government Procurements	17	13	5	1
e) Buyers and suppliers can easily access Internet services in the major cities	31	5		
f) Buyers and suppliers can easily access Internet services in regional areas.	22	10	3	1
g) Internet access is reasonably affordable in comparison to adjacent countries.	27	4	4	1
h) Maintenance and repair services are available to users at reasonable cost and time delays.	16	13	6	1
i) Sufficient expertise is available to government and suppliers to support and maintain the infrastructure and their software and hardware.	18	12	5	1
j) Online procurements are already being operated by private sector.	6	20	6	4
k) Some form of e-Procurement is already being used in Federal or Provincial level	4	16	11	5
l) There is a policy to host all e-government services, including e-Procurement system, in a central or designated data centre with adequate failover and security arrangements.	4	11	15	6
m) Procuring Agencies are well equipped with computers and Internet connectivity.	15	18	3	
n) The Federal or provincial government has set up Disaster Recovery Site (DRS) of primary data centre for data security or plan in progress to establish one.	4	8	21	3
o) Local software firms have adequate skills, experience and capacity to design, develop, maintain and operate complex systems like e-Procurement Systems.	25	5	5	1
p) Controlling authority and implementing agencies are in place for providing service and support for e-Signature.	11	9	14	2

q) Treasury related transactions are already automated (i.e. available Financial management information system) and provides interface for external software systems if required.	10	15	8	3
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**Legend: Y=Yes fully agree; P=Partially agree; N=Disagree, NR=No responses. Scores show numbers of responses across all those surveyed.**

120 It appears that there is little in terms of government policies towards system ownership or disaster recovery infrastructure. It is **recommended** that the consultation among provinces and federal PPRAs should opt for using existing/established data centres and enhance those if required to reduce the cost of establishment of new data centres as well as ongoing operation and maintenance costs. Currently individual provinces are also in the process of procuring IT equipment/ data centres to host individual MIS systems. These costs can be reduced by adopting / procuring common IT infrastructure keeping in mind data security and management capabilities at provincial levels.

## 7. Standards

121 There is no implemented Government Interoperability Framework (GIF) in Pakistan, but there is a guideline for systems development and for hardware acquisition. However, this issue does not present an obstacle to the rollout of e-procurement: It is **recommended** that the e-procurement system be designed around open international interoperability and middleware standards. Regardless, there is poor integration of the network into government management practices although an e-Gov intranet is planned. Symptomatic of this is the unsecure common usage of Hotmail / Gmail / Yahoo business addresses amongst government officials. Survey results are shown in Table 9.

**Table 9**  
**Interoperability Standards**

SUBCOMPONENTS	FINDINGS			
The degree to which	Y	P	N	NR
a) The Government has nominated an agency with responsibility and authority for developing and implementing standards.	19	6	8	3
b) The government is collaborating with the private sector and/or standards bodies in attempting to set standards.	7	13	10	6
c) The existing e-Signature and / or e-Transaction legislation is technology neutral rather than technology based.	5	8	10	13
d) The government has supported the provision of open standards and open architecture.	8	11	7	10
e) The government is setting up government wide interoperability framework for all e-government infrastructure and services.	6	8	11	11
f) Common management, classification and identification standards for the procurement of goods, works and services items are being applied or such catalogues are	1	10	15	10

already available. (e.g. International standards like UN Standard Product and Services Code (UNSPSC), Common Procurement Vocabulary (CPV) or any other catalogue standard.				
g) Standards related to procurement systems (where applicable) have been put in place.	12	15	4	5

**Legend: Y=Yes fully agree; P=Partially agree; N=Disagree, NR=No responses. Scores show numbers of responses across all those surveyed.**

122 The Federal Ministry of Information Technology is supportive of e-procurement and has already rolled out an e-Office Suite/e-Filing system. The e-Office Suite is expected to be functional by the end 2014. The e-Office Suite will cover all Federal Government Divisions with the provision of e-Government Data Centre, and access through the optical fibre-based state-of-the-art secure e-Government Intranet, with the deployment of e-Office Application Suite and its access to Federal Ministries/Divisions. Planned also is for an e-Readiness evaluation for e-Office users, and an IT Services Management Cell to resolve e-Office System issues.

123 For all government e-Services to work together, there is a need for a robust model for a Government Interoperability Framework. It is **recommended** that the Federal Ministry of information Technology focus on technical interoperability policy settings, security protocols and infrastructure, rather than application development. Online security has been weak. It is **recommended** that the e-Procurement system specified in this project be consistent with open international standards, and in particular will be based on Service Oriented Architecture (SOA). A policy directive should require that application developments be in terms of consistent technical standards (e.g. SOA) and perhaps for the relevant entity to retain code ownership or the license to modify the source codes facilitating customization to meet the government requirements. Existing policy settings do not provide a strong direction for this important issue. It is not clear whether any policy has been effectively communicated or driven with authority, and non-compliance has been an issue, compounded by IT capacity problems in many entities. In some countries, IT expenditure is not permitted without sign-off from a lead IT agency regarding consistency of the proposed expenditure with government GIF and architecture policies.

## **8. Private Sector Integration**

124 The private sector is considered to have reasonable competence with e-commerce, and its ability to take-up e-procurement is likely to be good. There is however very little out-reach by government to business and this should change with the e-procurement strategy, which should be responsive to business issues as well as public management requirements. Survey responses are shown in Table 10.

**Table 10:  
Private Sector Integration**

SUBCOMPONENTS	FINDINGS
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The degree to which	Y	P	N	NR
a) There is a high level of consultation with business on procurement issues.	4	14	17	3
b) Information and advice on procurement policy, regulation and process is freely available to the private sector.	20	14	3	2
c) Costs to participate in government procurement are acceptable to small business	17	10	8	3
d) The private sector has confidence in the integrity, fairness, consistency, transparency and efficiency of the existing system.	6	20	8	4
e) Existing procurement processes do not disadvantage small businesses.	15	14	4	5
f) Government is providing strategies to assist business to develop catalogues and access to its infrastructure and systems.	9	10	11	8
g) Government is harmonising its approach to procurement with its regional and international trading partners to assist supplier access.	8	13	9	8
h) Training and education on procurement is readily available to suppliers	7	14	15	2
i) Some private entities already have experience with international or national e-Procurement marketplaces	12	15	6	5

**Legend: Y=Yes fully agree; P=Partially agree; N=Disagree, NR=No responses. Scores show numbers of responses across all those surveyed.**

125 The Constructors' Association of Pakistan (CAP) **recommended** that E-procurement may be introduced first with high value contracts as the firms participating are more active and have adequate IT capacity to handle and participate in e-bidding process. This is consistent with the international experience and is adopted in the Implementation Roadmap in Part III below.

126 Survey results revealed confirmed that the private sector is not adequately consulted for procurement issues generally. Similarly, private sectors are left behind in case of upgrading their skills in procurement; there is very limited training facility available.

127 E-procurement generally received strong positive support from the business community *provided* it is presented in a user-friendly fashion. The only reservation to this is that there may be concerns arising regarding system security, and enablement of e-Procurement for the SMEs. The e-Procurement system should promote transparency and help support enhancing private sector trust to government and the procurement system. The private sector support is very important in the success of e-Procurement system implementation, adaptation and sustainability. Private sector organizations including different associations have shown their interest in working with the governments for the implementation and provide support to the private sector adaptation of such a system.



128 It is **recommended** that the bidding community be consulted; required skills enhancement trainings are organized on a regular basis; and partnered in e-procurement system implementation.

## 9. Systems

129 New developments need to recognise any existing initiatives to establish e-procurement systems. These may or may not be linked to an overall strategy to pursue e-procurement. The survey results in Table 11 indicate that there is not good compliance to existing rules for portal use. There are divergent views on many aspects such as whether businesses can currently register online. This suggests that current functionalities are not well known or understood.

**Table 11**  
**Current Systems or E-procurement Applications**

SUBCOMPONENTS	FINDINGS			
The degree to which	Y	P	N	NR
a) Existing procurement web sites (if any) are limited to online publishing of information	23	9	2	2
b) The e-procurement system/portal is web based and is a unitary system for the whole of government.	13	3	16	4
c) Information on all procurement opportunities is advertised on a single Internet site.	16	8	11	1
d) No proprietary hardware or software is required by suppliers to use the system other than a web browser and access to the Internet.	25	5	3	3
e) Buyers and suppliers can register for business online.	11	3	20	2
f) Buyer and supplier registries are linked to the system.	6	8	20	2
g) The system has a search engine to assist users to find information.	16	5	14	1
h) Procurement legislation, policies and guidelines, and information on how to use the system, can be accessed online	15	8	10	3
i) There is open access to all bidding and other process documents	18	12	4	2
j) Electronic download of bidding documents is available	14	16	5	1
k) Electronic upload of supplier proposal documents is available	9	6	20	1
l) The system provides for security and privacy of information.	12	7	11	6
m) Common inter-operability and procurement standards are applied to all systems.	6	10	15	5
n) The System can easily be extended to new procurement methods like e-Government Procurement (e-Procurement)	8	11	13	4

**Legend: Y=Yes fully agree; P=Partially agree; N=Disagree, NR=No responses. Scores show numbers of responses across all those surveyed.**

130 The Federal PPRA maintains an e-portal, and an interest in online self-paced training for the private sector, and is building a complaints database. The PPRA also is maintaining an online blacklist. There are web sites of PPRAS at the provincial level with similar functionality. However, there is need for a comprehensive e-Procurement system.

131 The Punjab Government in collaboration with the World Bank has launched 'Punjab Public Management Reform Program' (PRMP) to strengthen performance monitoring systems and feedback loops, improve transparency and access to information and to strengthen the resource management systems for efficient service delivery. The PRMP is aimed at Proactive disclosure of official information; establishing an automated record management systems within key departments; and geomapping and publishing online development schemes. The reform is aimed at offering information services to citizens on key public services by using IT interfaces (the Web, help-lines, SMS), and using IT to automate service delivery (electronic payments, online application, and back-end automation) in key services. One of the objectives of is to improve the capacity of departments for better expenditure management by developing and implementing a procurement performance management system, disclosing key procurement documents, and implementing e-procurement.

132 The Government of Sindh, Education Department, with the collaboration of the World Bank's Second Sindh Education Sector Project has initiated a process for hiring of consulting services for the Procurement Performance Management System. The expected system is aimed to design, develop, adequately test and ultimately actualize a web- based procurement management application that will assist its users to access, plan, track, analyse, and process procurement , and convert data into useful information using various search, sort, filter, and rank queries accessible both on local intranet and internet. This web-based application is desired to be an information reservoir for not only matchmaking facilities but also for decision support in supervision of projects, high lighting areas of improvement, and a platform for providing project progress statistics.

133 There have been some fragmented developments in few large organizations that have occurred in the vacuum of Federal or Provincial e-procurement system developments.

- i. SUPARCO, a defence organization, procures assorted services, items, machinery, equipment and materials. The Web-based e-Procurement System of SUPARCO is for Registered Suppliers only. New/un-registered suppliers can register as per a Guideline. The salient features of the systems are: (a) access through login ID and password, (b) on-line availability of lists of all types of items to be procured, (c) on-line access to view all uploaded ITs. The system currently provides on-line Invitation to Tender. SUPARCO plans that in future the system will be expanded to allow on-line submission of offers.
- ii. Pakistan State Oil (PSO) is the Pakistan's largest energy company. There is 20-25% procurement through single source/sole suppliers. An ERP system was initiated in 2004 with a US-based consultant. PSO is currently looking at introducing reverse auctions in procurement, and is

currently using web-based announcements. PSO had tried to introduce e-procurement using SAP R/3 however not successful. A local consultant was engaged but could not provide a solution. PSO is looking for solutions for introducing RFQs, invitations of sealed bids and reverse auctions through an e-procurement system. Currently PDF documents are taken on lotus notes and transferred into a SAP system. SAP reporting is inefficient.

134 Currently these developments are few and do not represent a major break-out of independent developments that would compromise an effective system. However, there is some urgency to proceed with a common Unitary e-Procurement Infrastructure to pre-empt any trend towards fragmentation, which would be difficult to unwind.

## **PART II – E-PROCUREMENT STRATEGIC PLANNING**

### **1. SCOPE**

135 An e-Procurement strategy needs to reflect local constraints including issues of capacity, legislation, system interoperability, the business model, and the governance framework for procurement.

136 The e-Procurement system should be conceived as a collaborative government procurement platform. All the stakeholders in the procurement process will have appropriate access using their secured user name and access codes and will have private secured working dashboards. Direct users of the system may be the procuring entities, the PPRA's, suppliers and other business entities, and maintenance service providers and the general public.

137 The Strategic Plan for e-Procurement should be for an end-to-end solution that addresses:

- i. Vision, Objectives and business case
- ii. Functions – what the system should do
- iii. Business model
- iv. Technical specifications
- v. Business model – who will develop, own, support the system
- vi. Capacity requirements
- vii. Implementation Roadmap

138 The development of a National Policy and Strategy for e-Procurement should be shaped by national priorities, national law, public institutional structures, and international experiences, and should include a vision and objectives against which performance measures can be set.

139 The institutional arrangements in Pakistan, whether at National or regional levels, can be satisfactory for the implementation of e-Procurement depending on adequate political support, and leadership from the PPRA(s). There is also a need for a Project Management Unit that will focus the required expertise. This will be discussed in the Implementation Plan and would be formed by the PPRA. Also satisfactory are the procurement legislation and the e-transaction legislation, except for non-urgent amendments set out below. There is a need for a vision and set of objectives against which the programme can be monitored. Finally there is a need for further development of some of the procurement methods, and a policy position in relation to the business case. The business case should be able to demonstrate that the investment in an e-procurement system represents good value for money: a business case is set out in Annex 4. The following sections will discuss these requirements in more detail and also set out the functional and technical requirements.

## 2. VISION AND OBJECTIVES

140 The objectives need to be defined as a precedent to the specification of a Strategy – if the objectives are unclear then the strategy will be ambiguous, and Readiness will raise concerns about readiness *for what?* It has been apparent that amongst some stakeholders there is not a clear understanding of what e-Procurement should look like.

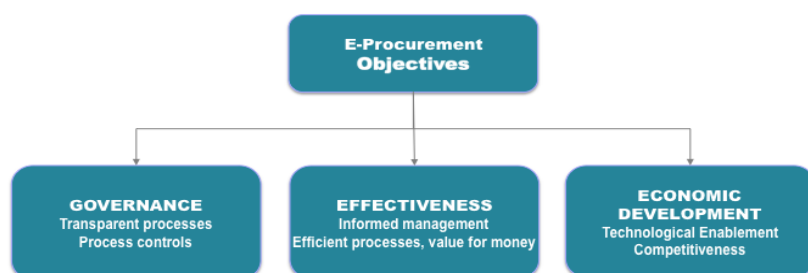
141 A vision and objectives have not been defined for e-Procurement in Pakistan, although there are some expectations that this will deliver transparency and efficiency. More broadly, it is **recommended** that the Vision for the e-Procurement program be governed by the core principles of procurement including ***Governance, Efficiency and Economic development and investment and, more broadly, enhance trust in government.***

142 More particularly, the key goals of the e-Procurement Program should be as follows:

- i. To enhance decision-making capabilities of procurement officials by providing meaningful and comprehensive procurement information
- ii. To improve financial planning and budgeting
- iii. To improve transparency in procurement procedures and practices
- iv. To bring efficiency throughout the procurement process and minimize the procurement cycle time.
- v. To encourage participation and promote competition among suppliers.
- vi. To harness economies of scale through demand aggregation and maximize value for money in government procurement.
- vii. To enhance citizens' and businesses' confidence in the government procurement process and the utilization of public funds.
- viii. To ensure confidentiality, integrity and authenticity of all transactions and data between the procurement entities and the suppliers.
- ix. To improve service levels to all stakeholders involved in government procurement.

143 These policies are summarised as three broad high-level objectives as shown in Figure 1: namely improved governance through enhanced transparency and management information, greater efficiency through workflow and document management, and help drive economic development.

**Figure 1 – E-Procurement Objectives**



144 These objectives are carried throughout the strategy and form the basis of the project *performance indicators* set out below. Several aspects of these benefits are also set out in other terms and partially quantified in the Business Case in Annex 4.

145 The Strategy is supported by a Business Case, which sets out in more detail the international experiences of efficiency benefits, and estimates a potential savings of approximately 7%, which would equate to approximately US\$490 million per year, aside from any downstream effects from improvements in the investment climate.

### 3. FUNCTIONAL REQUIREMENTS AND PRIORITIZATION

146 E-Procurement is made up of various functions that, as concepts, are largely stand-alone, and need to be good fits to procurement management of the government. The system should maintain an efficient, complete and up-to-date public procurement system for all public agencies in Pakistan.

147 The e-Procurement architecture must provide public sector buyers, suppliers and the general public with secure access to an integrated range of procurement systems and services, consisting of functional modules as follows:

- a) A ***Procurement Portal*** Service that will provide informational and transactional services, as well as advertising of bidding opportunities and invitations and publication of contract awards. Procurement portal services are already provided by each PPRA and are enshrined in legislation. However these existing Portals do not have the technical architecture or the required functions that are needed for an end-to-end system for the whole procurement cycle. The Portal specifications provided in this strategy will form the terms of reference for an upgrade of the service. The Portal upgrade should be a Priority 1 development.
- b) A ***Supplier Register***, which records basic details of suppliers interested in doing business with any part of the public sector. This should also be able to maintain histories of suppliers, their pre-qualifications, areas of operations, company registration details, office holders, and blacklisting history. The Supplier Registry provides for suppliers to register online at no charge. Registration will provide them with password access. There is no requirement for them to prove their credentials at the time of registration. Registration provides rights to receive bidding notices and other non-confidential information. It also will provide a capacity to submit bids online although this function might not be available immediately. There should also be provision for registration by other non-government stakeholders, such as the media, with access to non-confidential information such as notices and awards. The Supplier Registry should be a Priority 1 development.
- c) A ***Buyer Register***, which will host the details of procurement entities participating in e-Procurement and their designated procurement officers. The buyer registry limits buying scope for each official such that they can only procure to the limits of their delegation as set by a superior official. Any attempt to procure outside the limits of delegated authority would result in the request being referred to a more senior level for clearance. There is

also a requirement to register committees such as the tender opening committee and the tender evaluation committee. The Buyer Registry should be a Priority 1 development.

- d) An ***e-Bidding system***, which will provide for the secure transmission of electronic bid documents or e-lodgement by suppliers into the online tender box. This service is essential for improving efficiency and motivating businesses to move online, and also strengthens some aspects of governance. This should be a Priority 1 development.
- e) ***Direct purchasing and quoting system including catalogue-based ordering system and framework agreements***, which will provide a capability to undertake routine low value purchases. This should be a Priority 2 development as discussed below.
- f) ***E-Payments system***, which will facilitate online payments for the suppliers for the goods/services procured through the e-Procurement system by the public procurement entities. An e-payments system requires the collaboration of the banks, and is likely to take more time to bring online. This is a Priority 2 development.
- g) ***Procurement Management Information System*** inclusive of several key sub-systems and reporting capabilities as discussed in more depth below. This should be a Priority 1 development, which would not become activated until several other developments have taken place, but it must be part of the architecture of those developments. The PMIS is essential for departmental management and PPRA(s) monitoring role.
- h) ***Workflow Management System including a Contract Management System***, which provides an efficient means of contract administration and scheduling. This is a Priority 3 development.
- i) ***Procurement Planning and Inventory Management***, includes planning tools to facilitate scheduling. This is a Priority 3 development.
- j) ***Help Desk***, is essential from the first development and serves buyers and suppliers, as well as some other stakeholders. This is Priority 1.

148 The systems need to be able to interoperate with other electronic databases in government (as these become available) such as business registries, the FMIS, the HR / Payroll system, and other systems outside the government such as the banks. Details of these building blocks are set out below.

### ***1. Procurement Portal***

149 The e-Procurement portal hosted in the Unitary e-Procurement Infrastructure should act as a one-stop information portal for all public procurement within the country, including provincial governments. All advertisements and publication for public procurement in provinces and federal level should be accessible from the Portal. Suppliers should not need to search various individual departmental or ministry sites to find out what opportunities are available day-to-day.

150 The Common Unitary e-Procurement Infrastructure refers to the establishment of a Primary Data Centre and a Disaster Recovery Centre. An e-Procurement Software Solution should be procured with licensing arrangement arranged in such a

way that the e-Procurement System database can be separately clustered for individual provinces. It should provide facility for the separate user interfaces for federal and provincial e-Procurement portals, procurement processes and practices of the e-Procurement portal could be configured based on the prevalent federal and provincial procurement processes and practices, but still having provision of interoperability and information exchange facilities across the provincial and federal portals. This arrangement provides the facility of independent and complete administration and operation of the federal and provincial e-Procurement systems by respective federal and provincial authorities.

151 Functionality on the portal should include:

- i. Basic information such as the procurement laws
- ii. Procurement policies
- iii. Supplier registration
- iv. A list of all current bidding opportunities
- v. Procurement plans
- vi. Contract awards including archived information
- vii. Early warning notices of forthcoming bid invitations
- viii. Annual procurement planning by departments
- ix. Bid tracking capabilities
- x. Bid upload and document download
- xi. Intelligent search capabilities for suppliers linked to m-services<sup>15</sup>

152 The portal must allow individual suppliers to conduct intelligent searches, such as for regional work or procurement that relates to specific business types (such as cleaning contractors). The portal is essentially the shop-front and post box for government procurement. However, the majority of activities in procurement are not addressed from the e-Procurement portal – particularly the critical monitoring and reporting of management and compliance information. The Portal needs to link seamlessly to the workflow management module and other aspects of the PMIS.

## **2. Registration**

153 In the registration modules, profiles of Suppliers/Contractors/Consultant registration, and also registration of Procuring entities and their users/officers, and their e-procurement system access rights and authentication information are stored. The concept of single sign-on must apply and the same information can be used across all procurement activities while its validity is current. If e-procurement in Pakistan is developed under each province there should also be a requirement for bid advertising etc to be reported on a National site given that many businesses will presumably operate across more than one province.

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<sup>15</sup> m-services refer to services delivered to mobile devices – commonly mobile phones



### **3. E-Bidding**

154 The processes involved in e-bidding or e-tendering (demand aggregation, procurement plan preparation, e-publishing/e-advertisement, document vetting (approval), invitation for tenders, REOIs, RFPs and other procurement methods, downloading of tender documents, submission of bids, bid opening, and publishing the award of contract) are performed electronically. Additionally, contractors will be able to submit their bids electronically from their own premises in anonymity. Besides that e-Opening, and e-Adjudication, e-Contract awards are carried through the e-Tendering module. Online security is a significant requirement for e-bidding.

155 The establishment of e-Bidding procedures is usually accomplished progressively or, if management reforms to documentation, security protocols and departmental technology interfaces permit, these stages can be combined.

156 The provision of information on a central Internet site about the bidding processes generates the dynamics involved in the use of this Internet site by government agencies and suppliers.

157 The operations and qualities of the e-Bidding service should be consistent with the international best practices and standards. The World Bank has some minimum standards and qualities that must be met if e-Procurement systems are to be applied to the loans, grants or credits that it provides.

158 The e-Bidding system should be able to automatically produce formatted advertising notices for the portal.

### **4. E-Purchasing**

159 Important for efficiency gains is e-purchasing, including framework agreements. E-purchasing is more important than e-bidding for small businesses. The acquisition of low value, high volume, and commonly used goods, works and consulting services by direct quotation in the open market or from pre-qualified suppliers, and payment for the purchase constitutes the e-Purchasing activity. E-Purchasing requires greater involvement of the Supplier community in working with online catalogues. E-Purchasing brings ease of purchase and reduces the transaction costs significantly without which many framework agreements cannot be implemented.

160 This method is for use for low-value goods and services, for which bids are not appropriate; instead, a list of sources of supply is used for such purchases. The functional capabilities that make up an e-Purchasing system suitable for public procurement can be specified as the following:

- i. Many-to-many functionality (Many buyers to many sellers)
- ii. Decentralised buyers and sellers
- iii. Integrated with workflow / PMIS
- iv. Search for suppliers by name, category, locality code, and contract
- v. Comprehensive (100%) quote selection with minimum price benchmarking

- vi. Generate and award all procurement requests for information and quotes
- vii. Create purchase requisitions
- viii. Generate purchase orders while including optional approver workflow
- ix. Generate receiving (fulfilment) reports
- x. Allow for the customization of "buy policies"
- xi. Buyer data management
- xii. Supplier data management
- xiii. FMIS integration/ interface
- xiv. Reporting on all e-marketplace activity
- xv. Payment gateway integration
- xvi. Supply chain workflow management, recording and reporting

161 The e-Purchasing system operates as follows:

- i. When a specific good or services is to be purchased, the system automatically seeks quotations, (or issues a purchase order depending on the framework agreement) and selects the lowest bid within the buying rules which may be specific to a given area or locality.
- ii. Following approval by the buyer, the selected good or service is ordered directly online from the supplier and the necessary funds to pay for it are automatically set aside within the FMIS. Once the order is delivered, the authorised person who accepts delivery shall input acceptance into the system. Business rules should operate to remove any subjective intervention by the operator.
- iii. The system then automatically processes the payment order for the supplier, seeks payment, requires check authorisation, updates the accounts, addresses any tax issues, records inventory update, and records the information in the database for use in governmental and public oversight.
- iv. Often there is no inventory and purchasing proceeds on a just-in-time basis with delivery made to end-users.
- v. The information transactions must be automatically tracked for subsequent use in auditing and review of individual transactions by any combination of purchasing individuals, organizations, suppliers, region, price, and type of good.

## **5. E-Framework Agreements**

162 Framework agreements should control the majority of procurement transactions in government. The PPRA(s) should mandate their use wherever they are available.

163 Government agencies often face procurement difficulties that are not fully recognized within the procurement regulations or guidelines. For example, some

contracts need to bridge several years but budgets are annual, there is often a chronic shortage of trained personnel, the delivery quantities and delivery times are often not exactly predictable, etc. Better procurement planning is only a partial solution for these real world situations.

164 Framework agreements are particularly useful for many of these issues, and in jurisdictions such as in the USA, Britain, Portugal, Singapore and Australia, and also private sector organizations and NGOs, these instruments are common.

165 The objectives of framework agreements have been to address each of these issues, but the focus has varied between jurisdictions. In Europe and North America framework agreements are developed, *inter alia*, to gain better value for money from lower prices arising from the scale effects of aggregate purchasing. In India health services rate contracts are also driven by aggregation but often have a greater focus on process efficiencies and capacity constraints, and sometimes have resulted in higher prices.

166 Framework agreements can provide significant advantages where:

- i. There is frequent re-ordering based on the same (or similar) set of specifications;
- ii. The volume required cannot be predicted;
- iii. The required delivery dates cannot be predicted;
- iv. Supply may be required over an extended period;
- v. Budget certainty is not available;
- vi. Independent buying units within a Ministry or between different Ministries are duplicating each other's efforts and acquiring the same supplies;
- vii. Aggregating the demand from buying units can lead to significant volume discounts;
- viii. Small buying units lack the capacity to arrange and manage their contracts;
- ix. Crisis planning (such as for natural disasters) cannot accommodate the time required for traditional processes;
- x. No single supplier is considered to have sufficient capacity;
- xi. A choice of suppliers is considered desirable, for example to minimise the risks of stock-outs.

167 Framework agreements have been applied in every area of procurement – for common use goods, services including consultancies, maintenance and also employment, and add significant efficiencies for buyers and suppliers. Framework agreements for major and minor works are explicitly allowed for under European Commission (EC) directives and have been arranged by the United Kingdom Office of Government Commerce (OGC 2008). Typically there should be framework agreements online that cater for most low value simple procurement of government.

168 E-framework agreements provide major gains in efficiency and decentralisation. The e-Procurement system should enable a purchasing official to

identify an item in an online catalogue and issue a purchase order directly or to seek quotes from the market and follow this automatically with a purchase order.

## 6. E-Catalogues

169 Catalogues are a basic standard for e-purchasing. The process goes from the publication of items online by suppliers, to the electronic selection, order, reception and payments by the purchasing entity.

170 A framework agreement catalogue should contain the item name, item code, a description of the item, unit of measurement, supplier name, supplier part number (if any), etc. The framework agreement catalogue may allow for differential pricing by further specifying the freight charges (zone-wise), taxes, discounts for specific users, etc. for delivery in various locations.

**Figure 2**  
**Catalogue Classifiers vs Identifiers**



171 Catalogues for e-Procurement require the inclusion of classification codes as well as identifier codes. Classification codes are required to allow analyses to roll up data into summary form for reporting and analysis. For example, a financial report may present procurement expenditure in terms of ten broad categories of items, such as IT, vehicles, etc. Thousands of line items are summarised and drilled into in as much detail as necessary. In the paper environment, classification codes are less important simply because there is little opportunity to access, aggregate and analyse the data where this resides in paper format in numerous filing cabinets. The differences between identifiers and classifiers are shown in Figure 2.

172 It is also useful to have a further entry for each item that allows for a common word description as well as a picture. The classifier should be the international code operating in the EU, which is the Common Procurement Vocabulary (CPV). This helps promote international consistency for trade facilitation and is also consistent with most customs codes.

173 The item classification scheme should uniquely classify works, goods or service procured. It will classify the identified items in a hierarchical format to enable 'drill-down' and 'roll-up' analysis.

174 Catalogues should allow easy searching through keywords, part numbers as well as standard classification systems. Tracking of purchase orders and requests for information should be possible while purchasing through debit cards and other arrangements should be supported if required.

175 The benefits of implementing a common classification and item code are also that it:

- i. Facilitates demand aggregation for e-Purchasing (pooled procurement, framework contracts) and other works, goods and services procurement.
- ii. Automates the gathering and analysis of spend data for budgeting and planning.
- iii. Strengthens transparency and performance monitoring and reporting.
- iv. Enables automated price quotations for purchasing.
- v. Unifies Financial Management systems and procurement reporting.

## **7. E-Payments**

176 All payments in the procurement process should ideally be handled electronically. This includes payments made by suppliers to the government and contract payments from the government to suppliers.

177 E-Payment may be required in an e-procurement system for:

- i. Tender document fee
- ii. Tender security
- iii. Performance security
- iv. Payment to Contractor
- v. E-procurement value added service subscriptions – mobile alert, web services, additional space for document storage, etc.

178 The e-procurement system should include online payment methods. In the absence of online payment gateways, other feasible options of secured payment system can be implemented. Banks issue credit cards and cards are processed using their own gateways. An Automated Clearing House facility is the preferred option.

179 Throughout the procurement process, there are payments to be made by suppliers and government, which when handled manually, are inefficient. When e-Payment is fully implemented, the following payment types will be electronically handled in the e-Procurement system:

- i. Receipt of bidding document purchase fees and registration fees if imposed
- ii. Payment to contractors for verified delivery of works/goods/services

- iii. Receipt and management of electronic Performance Bank Guarantee
- iv. Other fees for value added services from the e-Procurement Portal

180 It is preferable that from the outset of implementation, the receipt of registration fees / transaction fees and the receipt and refund of bid and performance securities are handled electronically.

181 A central pooling account can also be set up in a principal bank to electronically handle the registration / transaction fee receipts (non-refundable) and securities and their refunds. The selected bank can be required to integrate its e-Payments solutions with the e-Procurement system.

182 There should be provision for contractors to transact such funds through a set of banking instruments approved and specified such as:

- i. Credit card / purchase card / debit card
- ii. Internet Banking
- iii. Electronic Funds Transfer (EFT)
- iv. Over the Counter.

183 The e-Payment system design must ensure that vendors are not required to open an account with a particular bank and they may receive and make payment in whichever bank they have their accounts. Other modes may also be considered provided that the following requirements can be met without manual intervention:

- i. Payment acknowledgement: A unique irrefutable reference number is generated as acknowledgement for the payments made by contractors.
- ii. Payment reconciliation: The reconciliation process reconciles the payment received in the central pooling account with that specific service request for which the payment was made (using the reference number for the service request).
- iii. Payment timelines: The e-Procurement system should be able to ascertain that the payments have been received, within a reasonable period of time (maximum 2 working days).

184 A pre-requisite for electronic contract payments should be interoperability between the financial system and the e-Procurement system. There appear to be some good developments made under the Pakistan State Bank:

- i. State Bank of Pakistan (SBP) team has initiated a \$35 Million project on various IT infrastructure development projects. SBP uses ERP Systems with Oracle. It has robust data warehouse with complete MIS System in place. There are 4500 PCs with 17 branches and there is online bank branch network in Pakistan. SBP has DR TL3 data centre with more than 100 servers of various sizes. SBP has 80+ links with redundancies in place on top of which there is Globus RTGS real time Globus system in place. Gross payments are accounted for using NIFT. Archiving is not centralized. Most of banking system in Pakistan is automated.
- ii. With regards to e-payment gateways SBP team informed that SBP is encouraging introducing e-payment gateways and recently new

regulation is in process of approval and shortly will be available on the SBP website.

- iii. Currently 1 Link is working successfully and there are 8 other prospect gateway options in competition waiting for new regulations to be in place. 1 link data switch with 33 banks as members in Pakistan with limited local bank interface and its scope is limited to interbank transfers only.
- iv. Mobile Banking has been introduced in Pakistan, however there is interoperability issue. Five mobile networks have been issued licences

185 There are also branchless banking guidelines and rules for e payment gateways available on SBP website. These and other payment developments will be helpful to e-procurement when e-payments are scheduled. This scheduling will not be with the first Phase.

## **8. *Procurement Management Information System (PMIS)***

186 While the initial portal strategy has often been regarded as the centre-piece of e-Procurement it adds relatively little public sector management value until accompanied by the information and management systems associated with real-time procurement workflow, control and budgeting. There is a need, at an early stage, to initiate the development of performance management and monitoring systems.

187 The work that is undertaken to consolidate the PMIS is closely related to the management systems for procurement in each agency. A standardised quality assured workflow process should be developed within the e-Procurement system, and some existing paper-based processes can be streamlined, modified or abolished in the electronic environment. Some of these issues are also discussed in the Implementation Plan under Policy.

188 It is **recommended** that the development of the PMIS become a central part of the e-Procurement agenda with, where possible,, all standardised documents as well as guides and policies, legislation being available online in real-time to the internal management activities of departments and interacting with the workflow processes of contract construction and contract management and with reporting.

189 The PMIS is essential for comprehensive spend analyses, which in accordance with best practice, should be undertaken quarterly or at least annually on a departmental/ministerial and whole-of-government basis. Spend analyses review what is bought, who are the buyers, and the transaction values, volumes and trends. This analysis provides the basis for the implementation business case and a list of baseline measures from which Key Performance Indicators can be developed. Areas of such analyses should include:

- i. Transaction analysis - the number & value of transactions.
- ii. Requisitioning activity - identification of the main buyers within an agency
- iii. Supplier analysis - the number of transactions per supplier

- iv. Off-contract spending – the number of suppliers used for the provision of similar goods/services, and if a local and/or central contract is in place for specific supply.
- v. Priority adoption lists – for users and suppliers, and timescales for their adoption.
- vi. Payments – the current payment methods.
- vii. Payment errors – a measure of potential cost savings.
- viii. Late interest payments – a measure of potential cost savings.

190 Although a consistent architecture applies, some PMIS functionalities need to be readily customised department by department because they reach into mainstream management delegations and processes.

## ***9. Workflow Management System***

191 The Workflow Management System contains the workflow engine and workflow rules stored in a register. The workflow automation module handles the flow of documents while preparing a tender, or a contract. The authorised personnel should use a workflow module for transferring draft tender documents and other documents through the document approval processes in each procuring entity with comments/ changes, and to seek approvals. All the activities in the workflow will be stored in an audit log. Workflow activities will be based on an Authority Register, which stores the user permissions to carry out authorised procurement activities. If a user lacks authority to perform an activity, the workflow engine will automatically refer the activity to a higher authority.

## ***10. E-Contract Management Module***

192 The processes involved between the issuance of a work order or contract and completion of the work are handled electronically in the contract management module, which is a sub-system of the workflow management system. With the contract management module, a government agency is able to maintain an overview of the works in progress, goods supplied, any contract variations, and services rendered. Once part of a contract is completed, then payment to the supplier is more quickly arranged and transacted. The system will have automated bring-ups according to the contract schedule. These bring-ups will trigger quality and delivery verifications, requests for bank transfers, and any re-scheduling of the bring-ups. This system also collects a repository of knowledge that can be used to measure the performance of a contractor as well as the performance of procuring entities in public procurement.

193 The system will also have the following capacities:

- i. Contract Variations – to record and publish price variations to the awarded price per line item or quantity purchased. A full audit trail of the contract and price variations is recorded.
- ii. Contract Extension – the system should manage the contract extension process. Many contracts are let for an initial period with the option to



exercise extensions for further periods. The system should provide an early warning report of contracts that are due to complete their current term. There can also be an automated report to show multiple extensions of the contract (this may arise for legitimate reasons, or may reflect poor practice).

- iii. Contract Cancellation – the system should manage the contract cancellation process and maintain an evidence trail for future review and legal proceedings.

## ***11. FMIS Interface***

194 There are clearly close relationships between procurement activities and budget management and planning, including in terms of progress payments, forward scheduling and contract commitments, inventory, and performance assessment and reporting. The efficient exchange of information should not be obstructed by differences in platforms or standards between the leading government entities.

195 While an efficient interface between the PMIS and the FMIS is important, these are separate systems. The PMIS needs to be accessible with two way data exchange between many buyers and many sellers, and includes the numerous operational considerations and authorisations for procurement that are likely to change on a daily basis. Adapting an FMIS to undertake these and other management functions is costly and difficult. Programming an interface between the PMIS and the FMIS is generally considered to be more effective and efficient.

196 The PMIS must include workflow and permission / authorisation trails, and all information transactions in any part of the procurement process including contract management, contract planning, and interactions between stakeholders. There is a requirement to re-engineer standard documents. Standard documents already exist in Pakistan but include substantial analogue elements. It is **recommended** that a BPR process be engaged at an early stage of this programme.

## ***12. Help Desk***

197 The Help Desk module provides the entire e-procurement system with consistent advice, user-friendly graphics, site navigation, content presentation, localization and context-based help. It should also provide user manuals, videos and FAQs for assisting users on using the e-procurement system efficiently.

## **4. TECHNICAL REQUIREMENTS**

198 The e-Procurement system should be developed in web environment using open-standards and open architecture facilitating interoperability with national, regional and international applications, payment and messaging systems, and procurement processes.

199 Such a solution will also eliminate the problem of being too tightly linked to a specific vendor of operating, application, browser, and other technologies.

200 E-Procurement systems and standards have evolved and matured over the past decade. Integration between external and internal back office systems for multilateral exchange of procurement information is a key feature. A system that collects data but does not have good multilateral exchange capabilities between government entities, and their transactional and management information systems, and many buyers and many suppliers is not adequate.

201 Users of the system must be able to seamlessly, securely and efficiently interoperate with the system on a bilateral basis. Users include:

- i. Procuring entities in government and their employees;
- ii. Suppliers and potential suppliers
- iii. General community
- iv. Banks
- v. Certifying agencies (if used)
- vi. Auditors
- vii. Multilateral Development Agencies

202 E-Procurement systems should use open common standards-based system development and communication protocols when cross-platform interaction is required and interfacing or integration with external systems should support both synchronous and asynchronous communication (message exchange) with the e-Procurement system and department applications.

203 Technical issues include considerations such as Information Security, Interoperability and Reliability. Scalability and Availability are also important considerations, to ensure that the e-Procurement system is capable of meeting larger transaction volumes. Apart from ensuring as reliable systems as possible, mechanisms are required for handling potential system disruptions via Business Continuity Plans and Disaster Recovery Plans.

204 These issues need to be taken into consideration regardless of the platform or service provider. These considerations also relate to the requirements and specifications for key system components of e-Procurement such as Content Management, Access Control Management, Workflow Management, and System Integration with external interfaces etc. All of these considerations should be subject to a Risk Management Plan. The commercial principles of authentication, authorisation, confidentiality, integrity and non-repudiation are also addressed within the risk management framework, along with virus protection and other security threats.

## **5. SPECIFICATIONS FOR CONTRACTING SYSTEM DEVELOPMENT**

205 The system architecture and contractual terms of reference of the system in the circumstances of engagement of a developer or partner, and also for any in-house development, must be in terms of Functional and Technical Specifications. There also must be the Non-Functional Specifications including for:

- i. Usability

- ii. Search engine
- iii. Linguistic/Multi-lingual Requirements
- iv. Online Help
- v. Graphical User Interface Interoperability
- vi. User Security & Administration
- vii. Information Communication, Interface and Storage
- viii. Interoperability
- ix. Scalability
- x. Performance Assessment
- xi. Hardware

206 Details for these are set out in Annex 5. The system performance for hardware and also for any Operations and Maintenance Agreement are specified in terms of System Reliability and System Performance – set out in Annex 6.

## **6. OWNERSHIP, DEVELOPMENT AND SUPPORT**

207 International practices in relation to the application of e-Procurement vary considerably. Some governments contract domestic or offshore services providers to undertake all aspects of their e-Procurement, with the government merely providing the data. Other governments have retained ownership and possession of their e-Procurement system and contracted out the management, while others have retained ownership and operations entirely in-house. All of these options, and variations in between, are technically possible. The issues impact more broadly than technical considerations; rather this is often a matter of national policy.

208 Internationally, ICT policies often provide for ICT investments to be broadly as follows:

- i. Government services may be implemented by appropriate outsourcing and cost recovery initiatives, including Public Private Partnerships that may be encouraged to help secure and manage these investments; and
- ii. Systems critical to national security, and other sensitive areas, will be owned and operated in-house.

209 The outsourcing of some government services to domestic providers can be significant for the development of domestic capability and credibility – in some markets a supplier will have diminished credibility if it does not supply to its home government.

210 The issues include the development of the domestic IT sector, and the capacity of the government to employ IT expertise using government salaries. On the other hand there are issues of security, vendor lock-in, skills development, political leadership and political risk. Models are as follows:

- i. Where the systems are provided from an external source (for example a Cloud<sup>16</sup> service) then issues arise such as transparency of controls – requirements in the service level agreement (SLA) are the key to managing risks of external providers and need to be consistent with international standards of risk management. For Cloud operations specifically, there are security questions<sup>17</sup> to be addressed including:
  - Are the systems auditable for government use?
  - What level of visibility into the specific cloud environment is available?
  - What are the availability guarantees and resiliency capabilities and how are these supported?
  - What guarantees of risk management and security are provided?
  - How are the solutions and services protected from denial-of-service attacks?
  - How comprehensive and mature is the information risk management and security program and the capabilities it provides?

The same requirements apply in relation to the system functionality and access standards. These should be subject to periodic audit review to ensure continuing compliance.

- ii. In some cases, an e-Procurement system is offered for ‘free’ provided that the recipient pays for the necessary customizations to match its own policies, processes and language requirements. This customization is undertaken by the system provider for fees negotiated by the provider. Commonly the resultant cost is greater than if the recipient government had developed its own system from scratch.
- iii. There is also a Public Private Partnership (PPP) model that has been used in some instances. This raises similar issues as above including monopolization and vendor lock-in. A PPP of e-Procurement in India has recently been terminated by a State government and has resulted in protracted court action despite the existence of termination clauses in the Partnership agreement. Other PPP options are the Build Own Operate and Transfer (BOOT) or the Build, Operate and Transfer (BOT) model. These approaches use developers to build a customized system for the government and operate this while local skills are being developed and

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<sup>16</sup> “At the time of writing, there is no comprehensive and commonly accepted standard to address the technical risks in cloud environments. There does exist, however, a hierarchy of approaches such as checklists and scenario generation techniques that require the user to have only a minimum knowledge of information systems security. To have a well-defined scope for the checklist, cloud managers can follow the formats that are provided by British Standards or the US National Security Agency (NSA). The NSA suggests using 18 areas for information security assessment, which is more comprehensive than the British Standards. It is suggested to follow the NIST’s guidelines for ranking threats, use NSA’s 18 areas of information security assessment, and use checklists for vulnerability assessments that can lead an organization to estimate probabilities of the occurrence of incidents and quantify information security risks” (ISACA 2011)

<sup>17</sup> These issues have been raised by John P. Pironti, CISA, CISM, CGEIT, CRISC, CISSP, ISSAP, ISSMP  
ISACA Vol15

then hand over to government officials over a period of typically two years.

211 The PPP models should preferably not be budget funded, but should operate outside the budget using fees generated by the system itself. However, depending on the ownership model preferred by the government, this may imply revenue hypothecation. National Finance does not support hypothecation of revenues from the system to operations and maintenance. Hypothecation support varies from province to province, however there was greater support and acceptance in case of Sindh. It would be best to consider a non-hypothecated business model.

212 It is **recommended** that the government, primarily through the PPRA(s), itself oversee e-Procurement procedures, since they are an integral part of government administrative functions, and accountability. However, the Government need not become a software developer for the support systems. Nevertheless, the Government will need expertise on issues such as system portability and standards, to be able to assess whether a Service Provider is delivering services and capabilities in a way that is consistent with the objectives. This means that the government must retain *effective authority and control* over its procurement, but its conduct can nevertheless be through third party service providers if desired.

**Table 12**  
**Strengths and Weaknesses of Options**

	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>	<b>Option 4</b>
<b>Advantages / Disadvantages</b>	In-house ownership and support, option for COTS	Off-the-shelf product with customization having in-house ownership with outsourced O&M, option for COTS	PPP COTS privately owned and operated with transfer option	Cloud service – remote fee for service e-procurement provision
<b>Development</b>	Some re-invention of existing software, good match to local context. O&M may lack skills	Some re-invention, good match to local context. Option to change O&M providers	Risks of vendor lock-in and monopoly fees.	Standard model, but may be poor match for Pakistan context. Risk of vendor-lock-in
<b>Roll-out timeline</b>	May be relatively slow while in-house team gets up to speed			May be fast provided it meets user requirements
<b>Ownership – sense of ownership by users</b>	Collaborative development promotes ownership	Customization, and rights to modify and make necessary changes by the Client with collaborative development promotes ownership	May be lower sense of ownership depending on collaborative instruments	Likely to be poor sense of ownership and trust issues that may obstruct acceptance
<b>BPR</b>	Required	Required	Required	Required

<b>Maintenance fees</b>	Budget based, offset by user charges	Budget based, offset by user charges, with performance linked to SLA contract	Fee based, guaranteed by budget, potentially complicated fee formula for performance	Fee based, guaranteed by budget, potentially complicated fee formula for performance. May require hypothecation
<b>Vendor lock-in</b>	No risk, some dependency on staff skills	Some dependency on O&M provider but should be portable	Significant lock-in risk	Significant lock-in risk

213 A related issue is whether the government will want a systems developer to partner with local entities to promote skills transfer – there have been several cases of this operating successfully. This would be a matter for policy and contract specification.

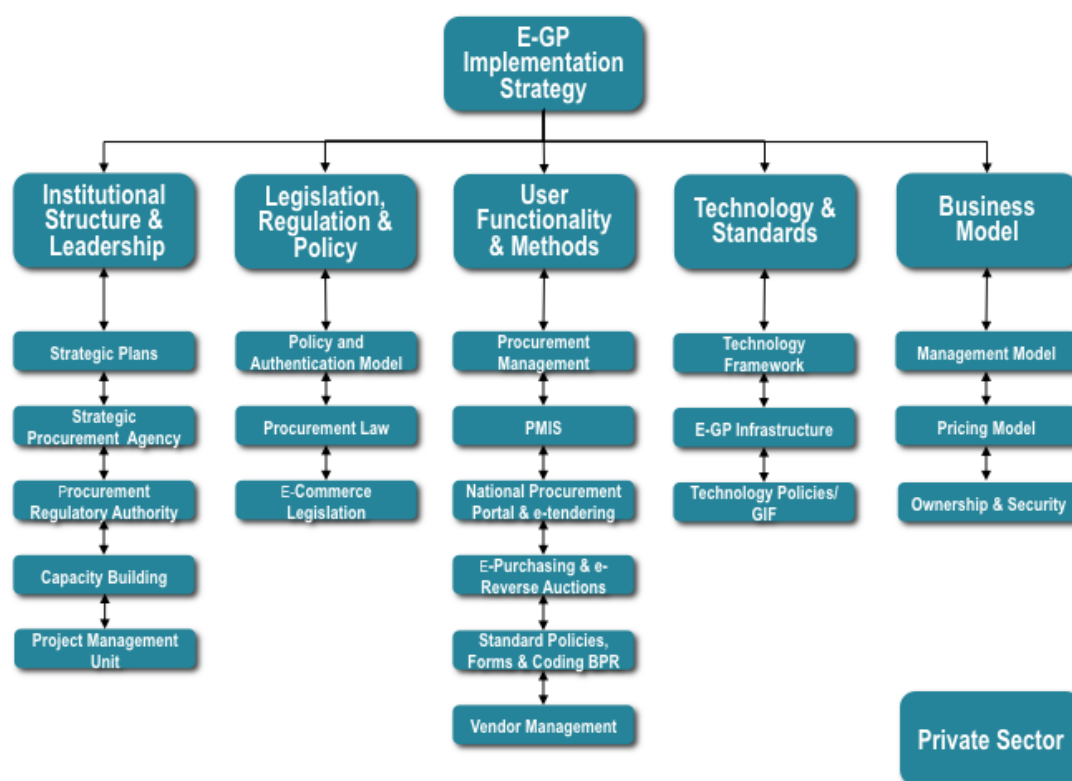
214 Table 12 shows some options for ownership and development. For Pakistan, it is **recommended** that the **second option** based on a Customised Off The Shelf system (COTS) be adopted: this will be considered further under implementation. The second option is neutral to the funding method and can be resourced either through the budget or by fees generated by the system, but which would imply revenue hypothecation.

215 The implementation plan is based on the premise that the government will want to own and control its procurement system. This is **recommended**, to avoid vendor lock-in and monopoly fee risks. This will require one-off internal or donor development funding, but will result in lower sovereign risk to government systems, management and information, and promote skills development. However, both for the development of the system, and the ongoing maintenance, it is also **recommended** that the government consider private sector support, rather than trying to support an in-house software development capability.

## PART III – IMPLEMENTATION ROADMAP

216 The implementation issues to be addressed are shown in Figure 3 in terms of institutional, legislative, functional, technical and the business model. In addition, there may be issues with the integration of the technologies with existing information systems, with the business model that these technologies impose on supplier-contracting authorities relations, and with the security and control mechanisms required to insure their appropriate use.

**Figure 3**  
**E-Procurement Development Requirements**



217 Some of these issues have been identified by the readiness assessment. Sometimes also there are constraints arising from the nature of the suppliers to government. This report will address many of these requirements, while other aspects can be a matter of national policy and capacity.

218 This framework broadly identifies the issues that are relevant to Pakistan and that are addressed in the following.

### 1. INSTITUTIONAL REQUIREMENTS

219 The key institutional structures are in accordance with good practice:

- i. The independent Public Procurement Regulatory Authorities currently oversee the procurement rules and standards, and monitors compliance and performance;

- ii. The procuring entities undertake decentralised buying, from their own budgets and procurement officers. The decentralised buying is undertaken in accordance with the rules set out by the centralised regulators in each jurisdiction.

220 The following issues and discussion apply equally whether there is to be one e-procurement system under the Federal PPRA serving all provinces of Government in Pakistan, or whether there is to be a National system and separate provincial systems under the respective PPRAs. It was **recommended** above that a Common Unitary e-Procurement Platform with separate instances of e-Procurement Portal having individually clustered database and own administrative authority to manage federal or provincial procurements still having cross provinces bidding opportunity postings. This would not encroach on the independent procurement management and organisation by individual provincial governments, and could best be considered as a common information infrastructure to be shared. Either model is technically viable. But a Unitary e-Procurement Infrastructure avoids expensive duplication and is likely to have stronger security. The following discussion is also based on the second option for the business model described earlier in Part II.

### ***1. PPRA***

221 In Pakistan, e-procurement cannot be imposed unilaterally, but requires a collaborative approach to implementation. The impact of e-Procurement on management systems is too complex for a unilateral approach to succeed in decentralised organisations. On the other hand firm leadership is required to ensure that aspects of e-Procurement are not bogged down.

222 To drive implementation, the PPRA(s) should establish at an early stage:

- i. Collaborative vehicles, and
- ii. A Project Management Unit

223 E-procurement will apply generally across government and affect various procurement work practices.

### ***2. Project Steering Committee (PSC)***

224 The PPRA(s) should establish a Project Steering Committee (PSC) comprised of executive representatives of key stakeholders. The PSC maintains the direction and milestones of the programme rather than contribution detailed technical expertise. The PSC also helps build a common sense of ownership.

### ***3. Project Implementation Committee (PIC)***

A Project Implementation Committee is required, supported by an Advisory Committee and should include e-Procurement advocates / champions as well as IT specialists from government entities selected primarily on the basis of their knowledge and expertise rather than on an *ex officio* basis. This Committee also helps build ownership, and reports to the PSC.



#### ***4. Project Management Unit (PMU)***

225 Regardless of the business model (whether the e-procurement system is to be acquired off the shelf and customised, externally developed or contracted, arranged as a PPP, a PMU is required to manage the project.

226 The PMU has roles in two stages, namely

- i. during system development or customisation and implementation, and
- ii. for ongoing support when e-procurement becomes operational depending on the business model adopted.

227 The PMU will arrange interdepartmental working groups / committees to advance various aspects such as BPR. Departmental task teams should be established in implementation pilot entities with the instigation of the PPRA. The **recommended** skill mix of the PMU should include:

- i. Strategic procurement management and accountability, user support, training and liaison;
- ii. Procurement specialists analysing market trends and requirements, buying for government, procurement advice, managing framework agreements;
- iii. A business manager who will manage the contractual relationship between the government and the service provider if the service is provided by a third party and will monitor performance.
- iv. Procurement support staff-administration of process and clerical work;
- v. E-Procurement system manager/analyst;
- vi. Data Centre, network and security specialist;
- vii. Database specialist-data management, procurement reporting;
- viii. Web Programmer;
- ix. Help Desk support.

228 When the system is up and running the PMU will operate to ensure smooth operation, regular maintenance, and efficient management of the e-procurement system, as essential requirements for the sustainability of the e-Procurement system, and delivering service to the procurement communities (i.e. all concerned stakeholders).

229 To guide and oversee the technical systems development and BPR as specified above a technical consultant should be engaged. This consultant may be complemented, intermittently, by a procurement consultant who would help guide the strategic issues, and the BPR required to align agency procurement management systems and create standard digitised bidding, reporting and management templates and monitoring frameworks as specified above.

#### ***5. Project Advisory Council (PAC)***

230 A multi-agency advisory group should be created to help guide development and implementation issues and build some broader ownership. This advisory group

should include the high procurement Ministries/department, Finance Ministries/Departments, Social Sector agencies such as Health dealing with high volume of procurement of drugs etc., and other important procurement operational entities. Most of the high procurement agencies are also on the PPRA Boards in Provinces and at Federal level. Because of the strategic significance of the PSC and the PMU it is desirable for there be a stability of expertise with these structures.

231 **Recommendation** The PPRA Board may endorse and approve the e-Procurement Strategy and implementation plan, as well as e-Procurement guidelines.

232 **Recommendation** Key stakeholders and individuals should be identified and co-opted into the support committees PSC, PIC, PAC.

233 **Recommendation** A Project Management Unit should be established by the PPRA, including co-opted members from other agencies if required.

234 **Recommendation** A set of project performance targets be established by the PPRA and used as a basis for reporting to the Government.

235 **Recommendation** A help desk be established during with the rollout of service modules. The help desk needs to be staffed by individuals with a service-oriented ethic who also know the subject matter or where to find it.

## **2. PROJECT MANAGEMENT**

236 The e-Procurement project implementation requires an effective and properly resourced PMU, operating with a properly maintained Risk Management Plan such as set out in Annex 7. Also, during the rollout phase, an additional set of key performance measures should be applied as set out in Annex 8, against which project management (both during rollout and ongoing) should report and be guided.

## **3. MANAGEMENT REGULATIONS, LEGISLATION, BUSINESS MODEL**

237 The following E Procurement Regulations regarding electronic transactions would be developed as part of implementation:

- i. IT Security Policy/regulations including in relation to the administrator
- ii. Application Usage Policy/regulation (includes clause on limited liability),
- iii. Audit Trail Policy/regulation,
- iv. Business Continuity Planning, backup and archival policy/regulation
- v. e-Payments/ Receipts Policy/regulation.

238 Procurement policies and rules in the e-Procurement environment also need to address several management issues:

- i. Inconsistencies between electronic and hardcopy documentation from government agencies, and from the private sector

- ii. The malfunction of government facilities before closing time set for electronic bid lodgement
- iii. Electronic bid opening procedures with paper
- iv. SME engagement and facilitation
- v. M-technology applications
- vi. Authentication method

239 Developing such policies/regulations is a simple process that should be completed in the short term. The following considerations illustrate some policy changes that may be considered by the PPRA(s) be appropriate:

- i. When quotations are requested in a traditional manual system, a minimum of 3-5 quotes are typically expected before the procuring authority can proceed with the procurement and select the supplier. Upon adoption of e-quoting, the best of the entire set of vendors offering the required product should be selected (100% sampling), thereby increasing competition and transparency. The electronic mode allows for evaluating quotations from any number of suppliers without adding any cost or affecting the timelines of procurement.
- ii. A policy position that accommodates e-Procurement access through Internet cafes and mobile phones to increase access, noting that access through Internet cafes conflicts with PKI authentication.
- iii. PPRA Rules/Guidelines on bid submission closure times should be revisited. Usually, bid closure time is during business hours and at times when Internet traffic is heavy. The policy can equally be set for midnight or any other hour when traffic is low. On the other hand this would mean that paper delivery of a bid would effectively close at a different time from e-delivery, but this may not be important depending on bid box security.
- iv. Other rules/regulations should also be revisited. For example, all communications should be directed to be via the clarifications (questions and answers) facility. All documents should be reviewed to remove other avenues of contact such as phone numbers and personnel identifiers.

240 It can also be noted that the European Commission rules allow for some variation of policies for the electronic environment, such as in the Box below.

Electronic access to documents	Article 38.6 in 2004/18, (corresponding provision Article 45.6 in 2004/17)	The time-limits for receipt of tenders may be reduced by five days provided the contracting authority/entity offers unrestricted and full direct access by electronic means to the contract documents and any supplementary documents. The notice text should specify the internet address at which this documentation is accessible.
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241 It should be noted that these policies are required regardless of the platform - whether the e-Procurement system itself is built in-house, outsourced or whether it is contracted on a fee for service basis – the core issues are mostly not the technology platform but rather about management in the information environment.

242 **Recommendation:** PPRA(s) to revise procurement processes and practices through Business Process Reengineering (BPR) to be consistent with the effective and efficient functioning of e-Procurement technology and should be documented in e-Procurement guidelines.

### ***1. Legislation***

243 Legislative requirements have been discussed in Part II. That discussion referred to legal opinion that the Electronic Transaction Ordinance (2002) is still in force. The analysis broadly speaking, suggests that the present legal framework with respect to the enabling provisions of the ETO 2002 and the status of other legislation in Pakistan does not create an insurmountable obstacle and in fact enables the delivery of e-government services, electronic transactions and undertaking e-procurement. It also found that almost everything that is required for e-procurement is reflected in that Ordinance, but **recommended** some enhancements, that are not critical to an immediate rollout.

244 Further, it is **recommended** that the e-Procurement system should avoid the requirement of digital certificates and PKI for authentication, and apply an alternative solution such as set out in the implementation plan.

### ***2. Business Model***

The Business Model issues have been discussed in Part II.

245 It is **recommended** that the Government (Provincial & Federal) should own and control its procurement system. However, both for the development of the system, and the ongoing maintenance, it is also **recommended** that the government consider private sector support, rather than trying to compete with the private sector to retain comprehensive skills in this area at public sector salaries.

## **4. BUSINESS PROCESS RE-ENGINEERING (BPR)**

246 PPRA(s) in Pakistan have developed some standard procurement documentation. This documentation requires revision to ensure that its information requirements are digital rather than analogue, while other non standard processes may also require standardisation. Standardisation of key procurement processes is an important enabler for bringing in efficiency and transparency into public procurement. This review defines the BPR function.

247 During various stages of the procurement process, buyer departments prepare various documents for the vendor and buyer community and other stakeholders. These include Annual Procurement plans, Early Information Notices, Notices Inviting Tenders/Bids, Prequalification Notices, Bid documents, Procurement Summary Reports, amongst others.

248 The following documents used in the procurement process should be standardised as far as possible. This standardisation process is an important source of the efficiency and transparency that accompanies e-Procurement:

- i. Annual procurement plans

- ii. Individual procurement plans
- iii. Early information notices
- iv. EOIs/Invitations for pre-qualification
- v. Bid summary notices
- vi. Bank guarantee formats for Security deposit and performance guarantees
- vii. Letter of award
- viii. Information to be disclosed in Contract Awards notices.
- ix. Evaluation Reports;
- x. Other standard documents will be required for e-purchasing.

249 Standardisation of REOIs / Invitation for pre-qualification, terms and conditions and bid documents depend on the procurement type and different standard formats need to be developed. Variations to standardised forms are possible, such as between Ministries, Departments, Agencies, Autonomous bodies and local governments.

250 Table 13 shows some standard documents that may require BPR to gain greatest productivity from technology:

**Table 13**  
**List of Standard Documents**

Type of procurement	Bidding documents
Goods	<ul style="list-style-type: none"> <li>• Pre-qualification for Goods</li> <li>• Standard bidding documents for goods</li> <li>• Standard terms and conditions</li> </ul>
Works	<ul style="list-style-type: none"> <li>• Pre-qualification for Works (with JV)</li> <li>• Pre-qualification for Works (without JV)</li> <li>• Standard bidding documents</li> <li>• Standard terms and conditions</li> </ul>
Consultancies	<ul style="list-style-type: none"> <li>• Request for proposal for individual consultant</li> <li>• Request for proposal for consultancy firms</li> <li>• Request for proposal for consortium bids</li> <li>• Standard terms and conditions</li> </ul>
Information Systems	<ul style="list-style-type: none"> <li>• Request for proposal for IS (Information Systems) – Single stage</li> <li>• Request for proposal for IS – Two stage</li> </ul>

251 Other standard documents are required such as for e-purchasing and e-quoting. The indicative coverage of the Standard bidding documents for Goods and Works is shown in Table 14.

**Table 14**  
**Coverage of Standard Bidding Documents**

Section	Title	Description
1	<b>Bidding Procedures</b>	
1.1	Instructions to bidders	This Section provides relevant information to help

		Bidders prepare their bids. Information is also provided on the submission, opening, and evaluation of bids and on the award of Contracts. Section 1 contains provisions that are to be used without modification.
1.2	Bid Data Sheet	This Section consists of provisions specific to each procurement and supplement the information or requirements included in Section 1 - Instructions to Bidders.
1.3	Qualification criteria and evaluation methodology	This Section contains the qualification criteria and the proposed methodology to select the best responsive bid.
1.4	Bidding forms	This Section contains the forms, which are to be completed by the Bidder and submitted as part of the Bid.
2	Works/ Supply requirements	
2.1	Bill of quantities/Bill of Materials (Works requirements/ Supply requirements for goods)	<p>For Works: This Section contains the Specification, the Drawings, and supplementary information that describe the Works to be procured</p> <p>OR</p> <p>For Goods: This Section includes the List of Goods and Related Services, the Delivery and Completion Schedules, the Technical Specifications and the Drawings that describe the Goods and Related Services to be procured.</p>
3	Conditions of Contract and Contract forms	
3.1	General conditions of Contract	This Section includes the general clauses to be applied for the contracts. The text of the clauses in this Section shall not be modified.
3.2	Special conditions of contract	<p>For Works: This Section consists of Part A: Contract Data, and Part B: Special Provisions, which contains clauses specific to each contract. The contents of this Section supplement the General Conditions and shall be prepared by the buyer</p> <p>For Goods: This Section includes clauses specific to each contract that modify or supplement Section VII, General Conditions of Contract.</p> <p>The special conditions over ride general conditions in the case of any difference between the two.</p>
3.3	Contract forms	This Section contains forms that, once completed, will form part of the Contract.

252 The e-Procurement system should provide these templates, so that Standard Bidding documents can be auto generated by combining the static (non-modifiable) parts of the document and user inputs (for the customised parts). The e-Procurement

system needs to facilitate auto-generation of other procurement documentation in standard format, using the inputs provided by the procuring authority. At each stage in the procurement process, auto generation and auto publishing of the documents is to be enabled.

253 It is **recommended** that a BPR committee be established by the PPRA including the system developer and involving major procuring entities, to review existing standard documentation and to minimise analogue information requirements. The committee will review the work practices behind each document and revise these such that comprehensive data is automatically downloaded from each template in a form that allows auto-generation of standard analyses.

## **5. FUNCTIONS AND STANDARDS**

254 The functions and standards required for e-Procurement within the context of Pakistan have been addressed above and standards for these are set out in detail in Annexes 5, 6.

## **6. INFRASTRUCTURE AND WEB SERVICES**

255 The requirements for a data centre with backup and disaster recovery have been discussed above. It is **recommended** that the PPRA develop a policy on risk, reliability and performance requirements and determine whether to create additional facilities and document in e-Procurement guidelines.

## **7. CAPACITY BUILDING AND CHANGE MANAGEMENT**

256 One of the factors responsible for the slow growth and uptake of e-procurement projects in the EU is the lack of champions who have the right skill sets, knowledge, aptitude and leadership qualities, occupying decision making levels and managerial positions. A survey of 15 countries that have successfully implemented e-Procurement showed that one of the most important lessons was the need to provide training to government managers, staff and suppliers. Failure to address this issue led to a lack of confidence in adopting e-Procurement and delayed implementation. This training should be a part of the contractual arrangements for the system developer.

257 Rollout should not exceed the capacity for change amongst buyers. Some buying entities are likely to be able to adapt quickly and should be encouraged to do so. Others will take more time and require additional training. The orientation programme should be flexible enough to accommodate these differences. However, there should also be a requirement that the transition phase is time-limited: Regulating that, by a target date, that first some then all tenders will be advertised online with download and upload of documentation does this. Other dates for other functions can also be set. For example, within six months after initial launch, all major procuring entities should have conducted at least three tendering processes online, with the target of 18 months of for all tenders conducted and downloaded online. The experience from Bangladesh is that take-up is likely to be significantly

more rapid than expected, and with modest fees for online tendering the system could be expected to cover its ongoing costs within 2 years of launch.

258 The training and capacity building programmes should be designed as per the level of involvement of the personnel involved in the hierarchy (or the committees formed for monitoring of the project).

259 Multiple mediums should be used to improve the accessibility of Training to the different user groups. These include online training kits and user manuals with demo application as well as mock transactions. Training kits must be provided to local kiosks, cyber cafes to disseminate the training at the lower levels. Existing training centres of other initiatives to be used for training at other locations. The developer should establish a training facility to rotate staff through as rollout progresses.

260 It is important that the PPRA builds a high level of awareness and expectation around the introduction of e-procurement. In several countries, the implementation agency or the Ministry has issued newsletters setting out progress and expected timelines, as well as how individuals may be affected. Available training is highlighted in these publications. Usually the same messages are re-iterated several times between the various newsletters, which are targeted at business chambers, implementing agencies and the media.

261 Capacity building is not a difficult obstacle for e-Procurement implementation and common programmes in this area would be of value to all stakeholders. In addition, the need for a communication strategy should be followed through.

262 **Recommendation** A Training programme be established by the developer / service provider, to be approved by the PPRA, in order that procurement officers from departments can be introduced to the systems and be able to walk through the screens. This training would be timed to coincide with rollout for respective departments commencing with the pilot agencies.

263 **Recommendation:** The PPRA develop a program to incorporate procurement managers in the transition to the e-Procurement environment as well as extend procurement training generally. This program could include:

- i. An orientation and awareness program of half a day for all procurement officers in the public sector as each significant new functionality is activated.
- ii. Access to high-level policy, management and technical advice through the Support Service.
- iii. An awareness program for dissemination of e-Procurement objectives and characteristics to all stakeholders including executives and policy officers.

264 The program will separately target Executives, Policy Officials and Procurement professionals.

265 It is **recommended** that the PPRA launch a publicity campaign around the implementation, that builds up during the development phase and raises awareness in what changes can be expected for buyers and suppliers. A good campaign is likely to attract media attention on possible savings and efficiency improvements.



## 8. PRIVATE SECTOR ACTIVATION

266 All markets, including those relevant to e-Procurement, are comprised of a 'buyer' side and a 'seller' side. The participation of the private sector cannot be taken for granted. International experience suggests that the most effective way to promote business activation is through the immediate value proposition. A business activation strategy will address existed contracted suppliers, non-contracted suppliers and may also work with the service industry that supports business applications.

267 Businesses will be sceptical of investing in a 'good idea' but receptive to a credible business case that offers lower costs or greater tangible opportunity and transparency.

268 It is **recommended** that the PPRA, in consultation with the major business associations, develop a business activation strategy to address existing government contracted suppliers, non-contracted suppliers and also work with the service industry that supports e-procurement applications. The principal method of delivery of this strategy should include a road show around major centres providing business seminars, e-mail, and advertising and through the business associations.

269 This strategy will address:

- i. Contracted suppliers, non-contracted suppliers
- ii. Business association members.
- iii. Costs
- iv. Supplier – supplier interoperability
- v. Kiosk services, Internet cafés
- vi. Government e-Procurement management policies and procedures.

270 Here the phased implementation approach is important - e-tendering is easily picked up by business at little or no cost and forms a foundation on which higher value e-services can be built. M-services have been especially attractive to businesses.

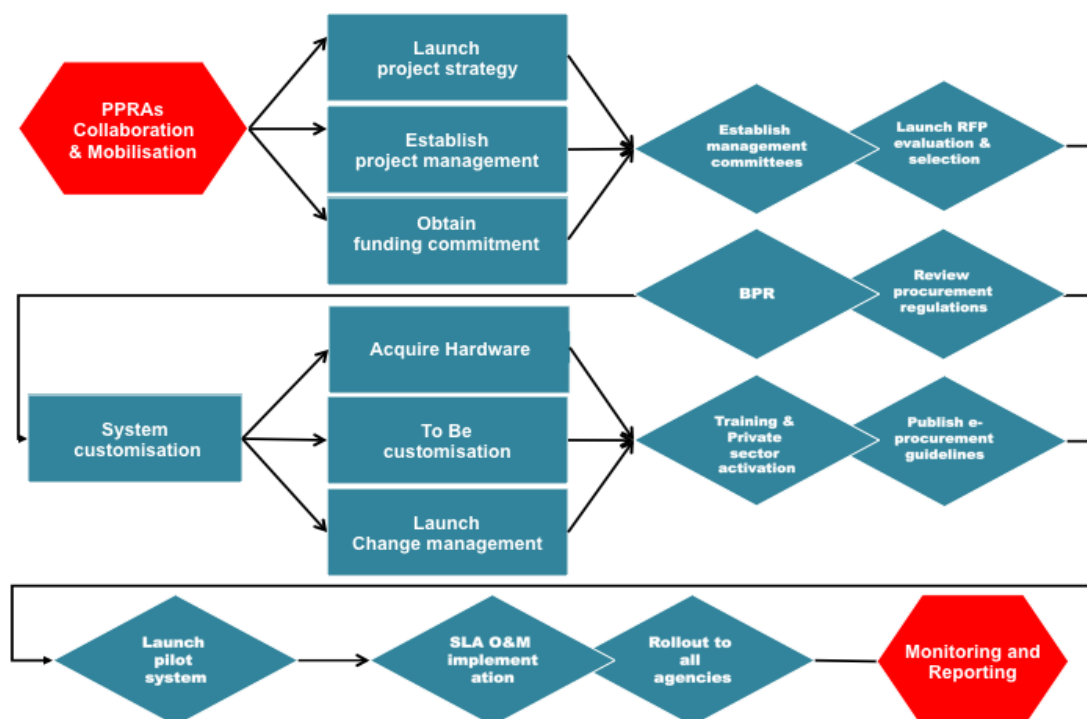
271 The application of mobile technologies is important. It should be noted that small businesses may not make daily use of the internet and are likely to be discouraged by routinely searching the e-procurement portal for contracts that match their capacities. Some businesses may bid for less than one opportunity each year. Expecting them to monitor the government portal is unrealistic.

272 Instead it is preferable for these businesses to register on the site including the sorts of contracts that they may be interested in, including contract value and location. The when a likely opportunity arises they system will automatically send an SMS alert. In some countries this additional service is charged for.

## 9. ACTION PLAN

273 The project should be planned in terms of the steps set out in Figure 4.

**Figure 4**  
**Implementation Flow Chart**



274 The Action Plan in Table 15 provides the major details for this implementation plan, which is not intended to be prescriptive but rather is a guide to the key developments that need to be managed.

**Table 15**  
**E-Procurement Action Plan**

Seq	Initiative	Action
1	<b>PPRA collaboration, approval</b>	<ul style="list-style-type: none"> <li>Launch project</li> <li>Announce vision, key goals and objectives, benefits</li> <li>Endorse and prioritise cross-government collaboration</li> <li>Establish strategy milestone targets and funding.</li> </ul>
2	<b>Establish support and implementing structures</b>	<ul style="list-style-type: none"> <li>Project Steering Committee (all PPRAs)</li> <li>Establish Project Implementation Committee</li> <li>Establish Project Management Unit</li> <li>Establish the Project Advisory Council</li> <li>Create working party from pilot (lead implementation) agencies</li> <li>Initiate BPR</li> <li>Establish terms of reference and meeting schedules</li> </ul>

3	<b>Review procedures, regulations - BPR</b>	<ul style="list-style-type: none"> <li>• Confirm technical and functional specifications</li> <li>• Launch phased development – Initiate BPR with pilot agencies</li> <li>• Establish timelines</li> </ul>
4	<b>Engage provider or developer</b>	<ul style="list-style-type: none"> <li>• Finalise technical, business and functional specifications including for catalogues</li> <li>• Finalise phases for rollout</li> <li>• Advertise for e-Procurement Implementation by ICB</li> <li>• Evaluate and award development contract</li> <li>• Establish training facility</li> <li>• Establish help desk / service centre and advertise to public and private sectors</li> </ul>
5	<b>COTS system customisation, Data centre, Disaster recovery</b>	<ul style="list-style-type: none"> <li>• Software customisation according to BPR and PPRA regulations</li> <li>• Data Centre with additional hardware, software and new architecture –Federal PPRA/Best suited PPRA acceptable to all provinces</li> <li>• Establish Disaster Recovery Site (DRS) with same replication of the data centre – Other than above integrated Data centre location</li> </ul>
6	<b>Launch change management for buyers and suppliers</b>	<ul style="list-style-type: none"> <li>• Media campaign</li> <li>• Short training for suppliers including online self training</li> <li>• Structured programmes for civil servants linked to seniority</li> <li>• For non-executive staff, developer to bring in batches through training facility immediately before piloting and rollout of e-Procurement System</li> </ul>
7	<b>Release operational regulations and e-procurement guidelines</b>	<ul style="list-style-type: none"> <li>• Revise existing procurement operational policies and harmonise with digital environment</li> <li>• Develop new operational rules and guidelines as required for digital environment</li> <li>• E-authentication and e-document policies for the use in e-procurement</li> </ul>
8	<b>System rollout</b>	<ul style="list-style-type: none"> <li>• Launch pilot with lead agencies</li> <li>• Initiate with ‘champion’ procuring entities</li> <li>• Phased extension to other departments</li> </ul>
9	<b>Establish operations</b>	<ul style="list-style-type: none"> <li>• SLA</li> <li>• Establish systems and SLA administrator</li> <li>• Self funded fee arrangement or budget assurance</li> </ul>
10	<b>Monitoring framework</b>	<ul style="list-style-type: none"> <li>• Develop baseline indicators and gather current –state baseline data on procurement performance</li> <li>• Help desk 24/7</li> <li>• Private sector feedback system</li> </ul>

275 It is preferable that the e-Procurement services and functions be introduced in a phased manner. This represents a risk-managed approach and is to be **recommended** over a ‘Big Bang’ that would carry high risk of incompatibility with user requirements and capacities.

276 The phased approach operates at two levels. First, e-procurement should be rolled out in a handful of lead agencies, rather than all agencies at the same time. This will enable issues to be identified without affecting numerous agencies – this is the lead agency or Pilot Implementation method (discussed below). At a second level it is also preferred in some countries, to rollout e-bidding first as preferred by CAP, then follow up with e-purchasing and other modules. This approach can and should be used in parallel with the Pilot Agency method.

277 Figure 5 provides a guide as to how the implementation timetable of e-procurement should undertaken, based on the adoption of the COTS approach as previously discussed. This programme would require effective project management.

**Figure 5**  
**Draft Implementation Scheduling**

E-Procurement Implementation - Guide						Timelines											
						Year 1				Year 2				Year 3			
No.	Project Task				Kickoff	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
A	PPRAs to establish commitment																
B	Establishment of Institutional Structures																
	Project Steering Committee																
	Project Implementation Committee																
	PMU with Programme Director																
	Decision on Business Model including revenue options																
C	PPRAs																
	Confirmation of Common item code classification standards - CPV																
	Development and publication of E-procurement Guidelines																
	Specification of supplier register and pre-qualification processes																
	Publication of compatibility policies to enable e-procurement																
	Publication of e-signatures and e-documents rules																
D	E-Procurement in Pilot Entities																
	Identification of 3-4 pilot entities																
	Formation of task teams in pilot entities																
	Business Process Re-engineering of processes																
E	Customise and launch e-procurement service																
	Confirm functional requirements																
	Confirm technical requirements																
	Select COTS partner and national counterpart																
	Launch the Procurement Portal																
	Pilot implementation of e-tendering module																
	Roll-out of e-tendering module																
	Pilot implementation of e-quoting																
	Roll-out of e-quoting																
	Design and pilot the vendor registration module																
	Roll out the vendor management module																
	Design and develop the e-purchasing module																
	Consult banks re payment gateway - launch with lead banks																
	Pilot the e-purchasing module																
	Roll out the e-purchasing module																
	Design and develop the e-contract management module																
	Pilot the e-contract management module																
	Roll out the e-contract management module																
	Integrate the e-payments module																
	Online Service - help desk 24/7																
F	Hardware and Infrastructure																
	Data centre, Disaster recovery, and PE hardware as appropriate																
G	Change management capacity and awareness programs public and private sectors																
	Media releases																
	Civil service training sessions and online modules																
	Business / supplier sessions and online training																
H	Establish Operations and Maintenance management, cost recovery / SLA																

278 The complexity and cost as well as the regulatory requirements, integration issues and expertise and understanding of the various sub-components mean that a lead-agency model should be adopted to initiate rollout: This means that rollout should commence with just nominated lead agencies, each of which should be large

procuring organisations. Not all procurement entities within these lead agencies need to be involved, but if possible some champions should be identified to lead.

### ***Pilot Implementation***

279 The e-Procurement system should be prepared with all types of procurement methods and all end-to-end procurement processes. All functions are equally important across the procurement process. Selection of procurement methods and procurement packages for the pilot implementation should be left to the Pilot organizations. They may indicate the procurement packages selected for the pilot testing in their Annual Procurement Plan. The selected package for e-Procurement should be fully completed through the use of the e-Procurement System. Parallel bid submissions of hard copy as well as electronic submission should not be permitted. Parallel bid submission only increases the burden on Public agencies, and it slows down the e-Procurement rollout. Procuring entities are open to start either with open tendering, quotation method or framework agreements for goods, works and services. Restrictions could be made in terms of value of contracts at the beginning, but not be mandatory.

280 For the pilot implementation a set of representative public procurement entities with adequate willingness to make e-Procurement implementation success, and also having procurement as well as IT resources should be nominated.

281 For example, based on the assessment, there is a range of prospective organisations for pilot implementation, including ***Provincial Irrigation & Works Departments, Pakistan Railways, Federal Ministry of Communication and Highways, State Bank of Pakistan, WAPDA, Pakistan State Oil***, which have significant complements of engineers/procurement professionals and may be candidates to lead e-procurement implementation.

282 Pilot implementation should last for the period of at least one procurement cycle for one type of procurement method.

283 The core functions are those that are essential for a full-fledged e-procurement roll out. The advanced recommendations include those that can be delayed for a later stage, and implemented depending on the progress of the program. It is **recommended** that the first developments and rollout be around information, publication, e-tendering and e-quoting. Framework Agreements should be included as they are developed and as early as possible – these should also be a major focus but are primarily dependent on procurement development rather than technology systems.

284 Because the central website will permit access to full bidding documentation the requirements involved in the provision of access are around the need to streamline and standardize procedures. The implementation phases are a guide rather than a prescription and should be driven by the PSC.

285 The ongoing maintenance and operations of the systems should be defined in the business model that addresses any revenue issues such as fees for aspects of the e-Procurement services. In order to provide open access to bidding documents and permit these to be downloaded on demand, it is necessary to verify that the final and legally valid versions of those documents are available, that they include all the

relevant information (including graphs and blueprints), and that the clarifications issued during the process are attached or subsequently notified.

Pre-requisites include standard bidding documents and Internet access to standard documents.

286 **Recommendation** The PPRA will, in negotiation with a developer or service provider, refine a timetable for the deployment of e-Procurement phases, which takes into account the managerial, policy, training and business issues defined above.

## PART IV – FUNDING ESTIMATES

287 Final funding requirements will be dependent on the results of the Supplier selection based on International Competitive Bidding for the implementation of e-Procurement system and other requirements set out below. Funding estimates are prepared considering two options, (i) the policy of establishing a Common Unitary e-Procurement Infrastructure in Table 16, and (ii) Separate systems for each Province as set out in Table 17.

288 The calculations are based on the e-Procurement System and data centre supporting a minimum 10,000 bids a year, 10,000 users, and a minimum of 500 concurrent users.

289 There should not be any restrictions on creating users, bids and adding additional procuring entities and users.

### OPTION I. ESTABLISHING COMMON UNITARY E-PROCUREMENT INFRASTRUCTURE

**Table 16**  
**Cost Estimates for Common Unitary e-Procurement Infrastructure**

Summary of indicative Estimation for e-Procurement system and Data Centre		
	Items	Cost (USD \$)
1	e-Procurement System, piloting implementation, warranty support. Core training, and support services for two years	\$3,000,000.00
2	Primary Data Centre, Secondary data centre hardware and required system software with licenses and Internet Connectivity for data centres for three years	\$1,500,000.00
3	Change Management (BPR, sensitization, workshops, seminars, help desk)	\$1,500,000.00
	Total	\$6,000,000.00

**Break-up given below**

1. Estimation for e-Procurement System, piloting implementation, warranty support. Core training, and support services for two years		
	Items	Cost (USD \$)
1	e-Procurement System and its implementation	\$1,000,000.00
2	Management, piloting support for PE and other stakeholders, training, maintenance for two years	\$2,000,000.00
	Sub-total	\$3,000,000.00

<b>2. Estimation for Primary Data Centre, Secondary data centre hardware and required system software with licenses and Internet Connectivity for data centres for three years</b>		
	<b>Items</b>	<b>Cost (USD \$)</b>
1	Servers and Storage devices  (Racks; Blade servers for web, application, database, EMS, backup, time stamping, domain control, log ship, anti-virus, test and training, development; SAN and related devices, Tape library), laptops etc.	\$500,000.00
2.	Network Active (Firewall, IPS, Switches, NMS, load balancer etc.)	\$200,000.00
3	Data Centre internal and external infrastructure  (DG set, UPS, Precision AC, Fire alarming system, digital CCTV, Surge suppressor, Access control system, Water detection system, dehumidifier, pest repellent, Data Rack, raised flooring, electrical and civil works, and passive components like network cables, patches, etc.)	\$200,000.00
4	System software  Operating system and licenses, Database and licenses, Anti-virus and licenses, Backup software, SSL certificates, time stamping server software, Application server software and licenses, third party components, SMS integration, etc.)	\$250,000.00
5	Internet Connectivity for three years	\$350,000.00
	Sub-Total	\$1,500,000.00

290 An operations and maintenance plan will depend on the business model to be decided.

## **Option II. Separate e-Procurement Systems in Federal and each Province**

**Table 17**  
**Cost Estimates for an Individual e-Procurement System in each Provinces and Federal Environment**

<b>Summary of indicative Estimation for e-Procurement system and Data Centre</b>		
	<b>Items</b>	<b>Cost (USD \$)</b>
1	e-Procurement System, piloting implementation, warranty support. Core training, and support services for two years	\$2,500,000.00
2	Primary Data Centre, Secondary data centre hardware and required system software with licenses and Internet Connectivity for data centres for three years	\$1,500,000.00
3	Change Management (BPR, sensitization, workshops, seminars, help desk)	\$1,000,000.00
	Total	\$5,000,000.00

**The break-up is given below:**



<b>1. Estimation for e-Procurement System, piloting implementation, warranty support. Core training, and support services for two years</b>		
	<b>Items</b>	<b>Cost (USD \$)</b>
1	e-Procurement System and its implementation	\$1,000,000.00
2	Management, piloting support for PE and other stakeholders, training, maintenance for two years	\$1,500,000.00
	Sub-total	\$2,500,000.00

<b>2. Estimation for Primary Data Centre, Secondary data centre hardware and required system software with licenses and Internet Connectivity for data centres for three years</b>		
	<b>Items</b>	<b>Cost (USD \$)</b>
1	Servers and Storage devices  (Racks; Blade servers for web, application, database, EMS, backup, time stamping, domain control, log ship, anti-virus, test and training, development; SAN and related devices, Tape library), laptops etc.	\$500,000.00
2.	Network Active (Firewall, IPS, Switches, NMS, load balancer etc.)	\$200,000.00
3	Data Centre internal and external infrastructure  (DG set, UPS, Precision AC, Fire alarming system, digital CCTV, Surge suppressor, Access control system, Water detection system, dehumidifier, pest repellent, Data Rack, raised flooring, electrical and civil works, and passive components like network cables, patches, etc.)	\$200,000.00
4	System software  Operating system and licenses, Database and licenses, Anti-virus and licenses, Backup software, SSL certificates, time stamping server software, Application server software and licenses, third party components, SMS integration, etc.)	\$250,000.00
5	Internet Connectivity for three years	\$350,000.00
	Sub-Total	\$1,500,000.00

## **ANNEX 1 – TERMS OF REFERENCE**

### **TERMS OF REFERENCE**

#### **E-Procurement Strategy**

##### **Background**

The e-Procurement has been identified as a key strategic tool in increasing the competitiveness of the national economies by reducing procurement costs. Many countries have placed a major focus on e-Procurement as part of their e-Government strategies. In the public and private sectors it was realized that the information and communication technologies for procurement will not be, on their own deliver savings. International experience has clearly shown that the fundamental benefits of e-Procurement are related directly to changes in strategic sourcing, business processes, user behaviors and relationships with market.

##### **Scope**

The scope of the assignment is to develop a e-procurement strategy for the various Public Procurement Regulatory Authorities in Pakistan. The firm shall be hired by the Bank but shall be working in close collaboration with the federal, Sindh and Punjab PPRA's. In order to prepare a strategy, the firm shall review the current infrastructure, institutional framework, stakeholders, and capacity required to support Government of Pakistan in establishing e-Procurement platform for efficient management of its procurement processes. The Bank has conducted the review of legal framework which shall be available to the firm as a reference. A detailed strategy is to be developed in this assignment with a clear roadmap and critical milestones for implementation. The development needs and challenges that will be faced during the implementation also need to be identified. Limitations and bottlenecks should also be highlighted in the review work. The assignment should be based on the following core pillars

1. Review of Procurement regulatory framework (an assessment has already been done)
2. Improvements in budgeting and planning
3. Contextual assessment of Country or Provinces
4. Identification of the Stakeholders
5. Profile assessment of the Stakeholders
6. Institutional framework assessment
7. Review of the IT and Telecom infrastructure
8. Market analysis and role of the private sector
9. Laws and Regulations
10. Financial analysis of the core component of e-procurement
11. Model for transaction cost comparing e-procurement and manual system
12. Skills need analysis
13. Training strategy and implementation plan

1.4

### **Main tasks**

1. Mapping the full e-procurement process in order to identify and promulgate high performance solutions for the Government of e-procurement processes, with a focus on ease of use and easy access for local and international market players. This may include the definition of business flows and information exchanges.
2. The expert group should identify or propose the design of core building blocks of e-procurement solutions that could potentially be generalized or become a reference for e-procurement.
3. Various areas of e-procurement will be under the scope of this assignment. For each of the items in the following list, core building blocks that can be generalized and related principles or proposals should be identified. The list is indicative and will be finalized at the kick-off meeting of the expert group.
  - E-submission
  - Authentication/Identification
  - E-signatures
  - E-tendering
  - Document formats
  - Encryption/Decryption
  - Integrity of Data
  - Confidentiality issues before the opening of the tenders

### **Duration**

The time period of the assignment is 12 weeks

### **Deliverables**

Inception Report – week 1

Draft Report – week 8

Final Report – week 12

## **ANNEX 2 – FOOTNOTES TO THE LAW REGARDING E-PROCUREMENT**

1. Section 96 of the Constitution (Eighteenth Amendment) Act, 2010 (10 of 2010), substituted Art. 270AA, in its present form, (w.e.f. April 19, 2010), in place of Art. 270AA as validated and substituted by section 10 of the Constitution (Seventeenth Amendment) Act, 2003 (3 of 2003) (w.e.f. December 31, 2003). Item 26 of the schedule to LFO (C.E.O. No. 24 of 2002), (w.e.f. August 21, 2002), had inserted the said Art. In 2002. Art. 270AA as validated and substituted by section 10 of the Constitution (Seventeenth Amendment) Act, 2003, read :

270AA. Validation and affirmation of laws etc.—(1) The Proclamation of Emergency of the fourteenth day of October, 1999, all President's Orders, Ordinances, Chief Executive's Orders, including the Provisional Constitution Order No. 1 of 1999, the Oath of Office (Judges) Order, 2000 (No. 1 of 2000), Chief Executive's Order No. 12 of 2002, the amendments made in the Constitution through the Legal Framework Order, 2002 (Chief Executive's Order No. 24 of 2002), the Legal Framework (Amendment) Order, 2002 (Chief Executive's Order No. 29 of 2002), the Legal Framework (Second Amendment) Order, 2002 (Chief Executive's Order No. 32 of 2002) and all other laws made between the twelfth day of October, one thousand nine hundred and ninety-nine and the date on which this Article comes into force (both days inclusive), having been duly made are accordingly affirmed, adopted and declared to have been validly made by the competent authority and notwithstanding anything contained in the Constitution shall not be called in question in any court or forum on any ground whatsoever.

(2) All orders made, proceedings taken, appointments made, including secondments and deputations, and acts done by any authority, or by any person, which were made, taken or done, or purported to have been made, taken or done, between the twelfth day of October, one thousand nine hundred and ninety-nine, and the date on which this Article comes into force (both days inclusive), in exercise of the powers derived from any Proclamation, President's Orders, Ordinances, Chief Executive's Orders, enactments, including amendments in the Constitution, notifications, rules, orders, bye-laws, or in execution of or in compliance with any orders made or sentences passed by any authority in the exercise or purported exercise of powers as aforesaid, shall, notwithstanding any judgment of any court, be deemed to be and always to have been validly made, taken or done and shall not be called in question in any court or forum on any ground whatsoever.

(3) All Proclamations, President's Orders, Ordinances, Chief Executive's Orders, laws, regulations, enactments, including amendments in the Constitution, notifications, rules, orders or bye-laws in force immediately before the date on which this Article comes into force shall continue in force until altered, repealed or amended by the competent authority.

*Explanation.*—In this clause, “competent authority” means,—

(a) in respect of President's Orders, Ordinances, Chief Executive's Orders and enactments, including amendments in the Constitution, the appropriate Legislature; and

(b) in respect of notifications, rules, orders and bye-laws, the authority in which the power to make, alter, repeal or amend the same vests under the law.

(4) No suit, prosecution or other legal proceedings, including writ petitions, shall lie in any court or forum against any authority or any person, for or on account of or in respect of any order made, proceedings taken or act done whether in the exercise or purported exercise of the powers referred to in clause (2) or in execution of or in compliance with orders made or sentences passed in exercise or purported exercise of such powers.

(5) For the purposes of clause (1), (2) and (4), all orders made, proceedings taken, appointments made, including secondments and deputations, acts done or purporting to be made, taken or done by any authority or person shall be deemed to have been made, taken or done in good faith and for the purpose intended to be served thereby.]

Art. 270AA as inserted by Item 26 of the schedule to LFO (LFO (C.E.O. No. 24 of 2002)), (w.e.f. August 21, 2002), read :

“270AA. Validation of laws.— (1) The Proclamation of Emergency of the fourteenth day of October, 1999, all President's Orders, Ordinances, Chief Executive's Orders, including the Provisional Constitution Order No. 1 of 1999, the Oath of Office (Judges) Order, 2000 (No. 1 of 2000), the Referendum Order, 2002 (Chief Executive's Order No. 12 of 2002) and all other laws made between the twelfth day of October, one thousand nine hundred and ninety-nine and the date on which this Article comes into force, are hereby affirmed, adopted and declared notwithstanding any judgment of any court, to have been validly made by competent authority and notwithstanding anything contained in the Constitution shall not be called in question in any court on any ground whatsoever.

(2) All orders made, proceedings taken, appointments made, including secondments and deputations, and acts done by any authority, or by any person, which were made, taken or done, or purported to have been made, taken or done, between the twelfth day of October, one thousand nine hundred and ninety-nine, and the date on which this Article comes into force (both days inclusive), in exercise of the powers derived from any Proclamation, President's Orders, Ordinances, Chief Executive's Orders, enactments, notifications, rules, orders, bye-laws, or in execution of or in compliance with any orders made or sentences passed by any authority in the exercise or purported exercise of powers as aforesaid, shall, notwithstanding any judgment of any court, be deemed to be and always to have been validly made, taken or done and shall not be called in question in any court on any ground whatsoever.

(3) All Proclamations, President's Orders, Ordinances, Chief Executive's Orders, laws, regulations, enactments, notifications, rules, orders or bye-laws in force

immediately before the date on which this Article comes into force shall continue in force until altered, repealed or amended by competent authority.

Explanation.— In this clause, “competent authority” means,—

(a) in respect of President’s Orders, Ordinances, Chief Executive’s Orders and enactments, the appropriate Legislature; and

(b) in respect of notifications, rules, orders and bye-laws, the authority in which the power to make, alter, repeal or amend the same vests under the law.

(4) No suit, prosecution or other legal proceedings shall lie in any court against any authority or any person, for or on account of or in respect of any order made, proceedings taken or act done whether in the exercise or purported exercise of the powers referred to in clause (2) or in execution of or in compliance with orders made or sentences passed in exercise or purported exercise of such powers.

(5) For the purposes of clauses (1), (2) and (4), all orders made, proceedings taken, appointments made, including secondments and deputations, acts done or purporting to be made, taken or done by any authority or person shall be deemed to have been made, taken or done in good faith and for the purpose intended to be served thereby.

2\*. Section 6 of the Constitution (Amendment) Order, 2007, President’s Order No. 5 of 2007 (P.O. No. 5 of 2007), promulgated by President Musharraf, in the period of Constitutional deviation (between November 3, 2007 and December 15, 2007), w.e.f. November 20, 2007, had purported to add Article 270AAA to the Constitution, that read :

“270AAA. Validation and affirmation of laws etc.—(1) The Proclamation of Emergency of 3<sup>rd</sup> November, 2007, all President’s Orders, Ordinances, Chief of Army Staff Orders, including the provisional Constitution Order No. 1 of 2007, the Oath of Office (Judges) Order, 2007, the amendments made in the Constitution through the Constitution (Amendment) Order, 2007 and all other laws made between the 3<sup>rd</sup> day of November, 2007 and the date on which the Proclamation of Emergency of the 3<sup>rd</sup> day of November, 2007, is revoked (both days inclusive), are accordingly affirmed, adopted and declared to have been validly made by the competent authority and notwithstanding anything contained in the Constitution shall not be called in question in any court or forum on any ground whatsoever.

(2) All orders made, proceedings taken, appointments made, including secondments and deputations, and acts done by any authority, or by any person, which were made, taken or done, or purported to have been made, taken or done, on or after the 3<sup>rd</sup> day of November, 2007 in exercise of the powers derived from any Proclamation, Provisional Constitution Order No. 1 of 2007, President’s Orders, Ordinances, enactments, including amendments in the Constitution, notifications, rules, orders, bye-laws, or in execution of or in compliance with any orders made or sentences passed by any authority in the exercise or purported exercise of powers as aforesaid, shall, notwithstanding anything contained in the Constitution or any judgment of any court, be deemed to be and always to have been validly made taken

or done and shall not be called in question in any court or forum on any ground whatsoever.

(3) All proclamations, President's Orders, Ordinances, Chief of Army Staff Orders, laws, regulations, enactments, including amendments in the Constitution, notifications, rules, orders or bye-laws in force immediately before the date on which the Proclamation of Emergency of the 3<sup>rd</sup> day of November, 2007 is revoked, shall continue in force until altered, repealed or amended by the competent authority.

*Explanation.*—In this clause, “competent authority” means, —

(a) In respect of President's Orders, Ordinances, Chief of Army Staff Orders and enactments, including amendments in the Constitution, the appropriate Legislature; and

(b) in respect of notifications, rules, orders and bye-laws, the authority in which the power to make, alter, repeal or amend the same vests under the law.

(4) No prosecution or any other legal proceedings, including but not limited to suits, constitutional petitions or complaints, shall, notwithstanding anything contained in the Constitution or any other law for the time being in force; lie in any court, forum or authority against any person or authority on account of or in respect of issuance of any of the legal instruments referred to in clause (1) and on account of or in respect of any action taken by the Chief of Army Staff, the President or any other authority in exercise or purported exercise of the powers referred to in clause (2).

(5) For the purpose of clause (1), (2) and (4), all orders made, proceedings taken, appointments made, including secondments and deputation, acts done or purporting to be made, taken or done by any authority or person shall be deemed to have been made, taken or done in good faith and for the purpose intended to be served thereby.

As P.O. No. 5 of 2007, including the said purported Amendment, was not validated by the Parliament, after general elections of 18<sup>th</sup> of February, 2008, they were held to void ab initio and of no legal effect in the Short Order dated 31<sup>st</sup> of July, 2009 and the detailed judgment of the Supreme Court dated 30<sup>th</sup> of September, 2009 in C.P. No. 09 of 2009 Sindh High Court Bar Association v/s Federation of Pakistan and others.

## **ANNEX 3 – E-SIGNATURES**

### **Government Fit-for-Purpose e-Signatures (Journal of Digital Signatures)**

#### **Introduction**

The application of technology in the area of public procurement has to date been more of promise than results. Technology can open the way for a whole range of applications of procurement methodologies such as e-bidding, e-framework agreements, and others. The low cost efficient access to management information in e-procurement enables the strengthening of control, oversight, transparency, efficiency, planning and competition contributing towards good governance in public procurement.

There have been notable successes, with significant benefits reported from the UK, Korea, Chile, Andhra Pradesh (India), Kazakhstan, Albania, Cyprus, the Philippines, Bangladesh, Nepal and others. In addition to transparency, potential savings from the implementation of e-procurement have been estimated to be in the range of 5-8% (OECD/DAC 2003) or up to 20% of procurement value in specific applications. Similarly, the Aberdeen Group reported (2008) that some public sector enterprises have significantly improved their performance as a result of e-procurement initiatives with lower transaction costs, lower maverick spend, and lower transaction cycle times.

On the other hand, in many jurisdictions the incorporation of information technology into public procurement has been slow at best, has frequently not engaged many potential suppliers or the broader public, and has been perceived as adding cost and complexity. There are many factors that can obstruct the level of adoption, including misfits between public technology policies and applications, and the business needs of the online marketplace.

This discussion will review the business requirements of procurement system stakeholders to identify the fitness for purpose of common applications and policies that have been adopted in this area of public sector management. The discussion will pay particular attention to the application of e-signatures, which have and continue to influence public procurement policy, technology and law.

#### **Fitness for Purpose**

A principle of government procurement practices is ‘fitness for purpose’: that is, the procurement method and the final procurement outcome should be best fit for the purpose in reference to the objectives of the procurement itself. Fit-for-purpose in government procurement is recognised internationally as a core principle (for example the OGC 2008). The fit-for-purpose principle equally applies to online procurement applications, or the design and management of government e-procurement.



Within the online procurement environment at the technical level, considerations of security and e-signatures have tended to predominate, and are often the first issues to be raised in the concept development phase of a government e-procurement system. The values and issues of e-signature methods have been the subject of debate that has been active for most of the life of online commerce, but rarely subjected to a fit-for-purpose test for the specific application of government e-procurement.

Within the context of government e-procurement, the fitness for purpose of e-signature techniques has been presumed by some to be a non-issue – a bygone problem that can be managed by standard applications, in particular by Public Key Infrastructure (PKI) based Digital Signatures. And yet in many places, e-procurement rollout has stalled at or near the inception stage, and some targets set for ten years ago are not even close to being met today (European Commission Green Paper 2010). Amongst the causes, the methods of authentication or e-signatures have been identified, and it is the purpose of this paper to subject these to a fit-for-purpose review.

### **UNCITRAL Model Law and Guidelines Development**

The United Nations Commission on International Trade Law (UNCITRAL) has, from an early stage, recognised the significance of many of the issues of online commerce. UNCITRAL model law for e-commerce has guided many government e-procurement laws in existence today. UNCITRAL deliberations and recommendations for this area have been of particular relevance because they have sought to articulate government-to-business requirements in terms of governance and user confidence.

There has been an evolution of UNCITRAL understanding that has paralleled that of many practitioners. UNCITRAL issued its original Model Law on e-commerce in 1996 following extensive consultation and analysis of the policy issues that arise in introducing and using government e-procurement systems, and all of its articles might be applied to e-procurement. That Model Law embraced the concept of technological neutrality.

In 2001, UNCITRAL modified some of its criteria, and enacted another model law, this time on e-signatures. This e-signature model law implied a PKI technology-based scheme. However, UNCITRAL changed its approach again and in 2005 prepared an International Convention for contracts between different countries. (United Nations Convention on the Use of Electronic Communications in International Contracts, 2005). That Convention is more than a model law, it is a legal text that may be endorsed by countries. The Convention adopted an open approach to electronic signatures, consistent with the technological neutrality promoted in the first model law of 1996.

The UNCITRAL Convention (2005), now consistent with the technological neutrality principle, accepts in principle any authentication method that allows the determination of the identity of a person and the establishment of the personal involvement of that person. Importantly, it also “admits agreements between parties, antecedents and the proportionality between means and purposes, including the further proof, thus admitting the scope for activities to be *risk rated* in determining the approach to authentication”. Risk rated processes are more consistent with functionally equivalent traditional methods and frequently more

efficient. The UNCITRAL 2005 Convention thus implicitly recognised that conventional PKI is not a standard and that there may be competing authentication technologies that are less costly, better fit-for-purpose, and more easily understood by business users, and equally or more ‘enhanced’.

The UNCITRAL Working Group in this area recognised that acceptance of e-procurement systems requires user confidence in the systems to be used, and the confidence of procuring entities in system performance attributes. Issues affecting user acceptance go beyond legal aspects of authentication and security confidence and include value for money as well as convenience in its adoption. The Working Group also recognized that, inter alia, the model Law should not act as an obstacle to the greater use of e-procurement, and avoid non-essential user complexity, inconvenience or costs, with the consequential disincentive to user adoption. In an implied reference to the tendency of governments to legislate for PKI technological solutions, Nicholas (2010) also noted that a lack of technological neutrality has promoted a tendency to over-regulate or prescribe new techniques or tools in procurement, which ultimately make their adoption more difficult and tend to lock in technological obsolescence. The recognition that the technical solution needs to harmonize with the business application, that the technical solution cannot sensibly be assessed simply in technical terms, while reasonably self-evident and essentially a restatement of the fitness for purpose principle, is as discussed below, often forgotten.

The revised UNCITRAL framework (2005) encourages enacting States to consider the costs and benefits of the solutions they adopt, bearing in mind the types of checks that have been traditionally used to check handwritten signatures. In other words, the text advises countries to legislate this area from a basis of evidence and understanding of the issues, costs, risks and benefits (i.e. to adopt a fit-for-purpose approach). However, in the intervening years many countries had developed e-government laws based on specific technology, namely the application of conventional PKI based digital signatures, and despite the revision, some countries, in need of such legislation, have continued to copy those pre-existing laws.

This outcome has persisted partly because some advisors originate from those PKI legacy countries, and partly because the UNCITRAL 2005 guidelines have not been as prescriptive and have required more background research and expertise to understand, thereby posing an obstacle to good practice particularly in many low and middle income countries. In addition, the institutional structures that have been based on the early model are often difficult to unwind, and even act as an incentive to adopt methods regardless of fit-for-purpose. Further, despite the guidelines, principles and advice, many jurisdictions continue to reveal a weak understanding of the methods and best practice, and in fact place specific technological requirements and ‘safeguards’ on the use of communications in general and e-tenders in particular.

### ***Business Requirements***

The requirements of the government procurement marketplace are, in principle, consistent with UNCITRAL regarding the need for confidence, security and confidentiality, authentication and integrity, and cross-border interoperability. In practice, at the user level the requirements are as follows:

- There should be a one-on-one business relationship between the government e-procurement system and suppliers – that is, all competent e-procurement systems for government include a supplier registry that records relevant identifying information such as company registration, directors and taxation records, sometimes police records, and also performance histories and capabilities of companies supplying to government plus provision for ongoing updating. The existence of some or all of this data with a third party, a Digital Certificate Provider, does not absolve the government from requiring all details and probably more in its own supplier register. This registry data refers to company identities, and so cannot be provided by personal certificates that might be used for many other government applications such as social security and health services, and similarly these company identities are unlikely be useful for most other government applications. There is thus a specific need for company identifiers for the particular purposes of government procurement, that generally provides few if any practical benefits for non-government business-to-business (B2B) activities, and in some cases may not be permitted to be used for B2B because of confidentiality constraints;
- The need to provide confidence to the business user side of the market is specifically a requirement for security rather than authentication (excepting for providing authentication of the government site itself). However, the PKI model used for e-procurement provides authentication rather than security. The fundamental distinction between these concepts is widely misunderstood by officials and some procurement consultants;
- The buyer side of the market requires the provision of authentication, although the extent of this requirement is often overstated when aligned with risk. In the case of tendering, the stringent requirement by some authorities for an “enhanced” e-signature as a condition of tender submission bears no functional equivalence to the traditional paper bidding practices whatsoever. In the paper environment, anyone can submit a tender, including a courier. Authentication takes place after closure of the tender invitation phase, in what is generally a due diligence stage. There has never been any additional risk from unauthenticated online submissions, and due diligence is required in one form or another regardless of pre-tender authentication. There is a requirement for documents to be signed, but there are numerous risk-rated options for this with equal or improved fit-for-purpose qualities. For major complex or high-risk contracts, the due diligence step is all-important and has nothing to do with pre-bid authentication and could not reasonably assume anything from any form of “enhanced” e-signature. For lesser contracts, the risks are also less, but even here the normal processes of government procurement are in practice risk managed such that cash transfers are safeguarded regardless of whether the procurement is paper based or online, as a Business Process Re-engineering process would clearly establish.
- Frequently for low and middle-income countries there is a need for business access to be enabled through shared infrastructure such as Internet cafes. However, Internet cafes cannot safely be used in conjunction with PKI. Even where a token is engaged the reality is unsatisfactory: tokens are at greatest risk of theft or loss precisely amongst business users who would be

using Internet cafes, and who for example routinely leave USB devices behind in the café desktop machines themselves.

- Cross border trade facilitation has also been identified as a requirement for the method of authentication. The prospects of applying PKI to establish cross-border trust are fundamentally challenging in the best of circumstances. The business imperatives to fulfill this objective have not generally been satisfied, except at a technical level that is somewhat removed from the realities of business administration, risk management and trust. There is also limited capacity within many public institutions to assess cross border authentication online even where this may be technically present. More seriously some governments have insufficient capacity to screen and oversight domestic PKI certificate issuers where, in some cases, fraud and corruption may easily be perpetrated and may also be facilitated by the commercial arrangements allowed by some governments.
- Also, for government e-procurement there is a requirement for integrity assurance for all bidding documentation. However, limitations of asymmetric key applications used by PKI limit integrity assurance to just a few aspects of the bid such as the bid price unless a hash function is used, in which case a clear text version of the bid is also transmitted, with security dependent on the channel-level and storage mechanisms.

Management of digital certificates is one of the areas not seriously considered by many governments before initiating PKI based e-Signatures. Managing and updating digital certificates are complex, and delay transactions, especially in the government, where staff transfers are a frequent occurrence.

UNCITRAL guidelines explicitly provide for risk-rated means. Risk-based considerations are capable of simplifying many of the applications. For example, some systems have sought to avoid the technical consequences of requiring an electronic document to be “signed” by referring to such documents simply as being capable of authentication – the Kazakhstan e-procurement system requires tender securities to be provided with tender submissions, but arranging banking transfers for this purpose is largely redundant (it is only relevant to the winning bid), so Kazakhstan has sensibly required only scanned evidence of a security from a banking document. This scan is required to be matched with the original by the winning bidder, and failure to do so would result in debarment: this represents an entirely adequate fit-for-purpose low “tech” solution to what otherwise would be an unnecessary complexity and cost, and likely to have significantly delayed the release of that service.

### ***Fit-for-purpose Authentication***

In the light of the narrow pattern of application of PKI in the context of government e-procurement, where for many countries any or all activity is between users and the government, there is nothing to be gained by insisting on a non-hierarchical solution. In any authentication process, as an initial step, the entities need to establish who they are. Second, this identification data needs to be included in an easily accessed repository available to all relevant users. In many countries, and especially for procurement, most or all of the data required for an entity to

demonstrate who they are originates from government itself: company registration, passport, drivers licence, birth certificate, national ID, etc.

From a business perspective in a conventional certificate-based PKI scheme, an entity supposedly unknown to government, approaches government to obtain its identifiers such as company registration details, tax records, etc, which are duly provided. But then, supposedly still unrecognised by government, the entity is required to take these documents to a third party Registration or Certification Authority (CA) who often knows neither the government nor the entity, reviews the government-issued documents and provides a Digital Certificate as certifying that the entity is who they say they are, at which point the government now recognises the entity. The circularity is evident. Further, the entity is dealing with government in a strictly bilateral relationship specifically for e-procurement, which requires company registration as described above, and there is no value added by a public key. If the entity is dealing with multiple governments that do not share a supplier registry, a public key still offers no benefit because the entity will be required to register with each individual government anyway. The establishment of an independent repository is redundant. Linn and Branchaud (2004), Mariën (2012) have provided similar analyses.

Certificates' application practice should be a close fit-for-purpose. A primary goal of certificates' original development was to make public keys available from unprotected repositories or transferred across unprotected channels. The bilateral relationship required by government e-procurement abstracts away the rationale for a public key and repository, while channel-level mechanisms (i.e. SSL, VPN) protect data messages from attackers while in transit between a server and a client, and can assure the relying party that it is receiving information from a securely identified source.

To summarize, if an entity goes to the trouble of authenticating and registering in the government supplier register, the need to authenticate themselves to an independent CA becomes redundant other than to list in a certificate repository, but this is also superfluous if the government e-procurement system users are the only users of the supplier registry identifiers, and it may even be the case that those supplier details are more current than those in a third party Certificate.

In governments that have already promulgated the PKI-based model law for authentication, a better fit-for-purpose application of the same technology can often be introduced without the need for legal amendment, simply by delegating to the authority operating the e-Procurement system, the legislated role of the CA, thereby eliminating much of the foregoing redundancy and opening the way for a risk-based approach to certificate policy and practice, and notably providing for online issuance for low risk or risk-free processes. This is a 'closed' PKI system, where the CA is itself the relying party. Examples of a closed model include a bank self-operating the CA function and issuing passwords / tokens / certificates to its customers.

### ***International Trends of PKI in e-Procurement***

The preceding discussion refers to the use of conventional PKI-based digital signatures, being a sub-set of the broader concept of electronic signatures.

Conventional PKI has already been corrupted in e-Procurement: in some cases private key holders want to reveal their private keys to third parties - the key has commercial value and is therefore tradeable. For example, there have been cases of suppliers borrowing, renting or buying other contractors' certificates, so that a single supplier can bid as several different entities. The response to this fraud has been to pass regulations against it (outlawing corruption).

Many countries are proceeding with e-Procurement without the use of certified digital signatures including Australia, Albania, Singapore, UK and USA, some States of India, and others. Some countries that had previously adopted PKI have since abandoned this.

The EC Green Paper (2010) on e-Procurement has acknowledged that the PKI-based digital signature methodology is onerous and has been a barrier to faster rollout of e-procurement. It also acknowledged that a wide range of alternative requirements and solutions have been adopted across the EU to deal with issues relating to authentication and identification. Some of these solutions are technologically simple e.g. the use of username/password combinations; others are more complex; requiring specific types of electronic signatures, including 'qualified' signatures. "The decision to promote qualified e-signatures within the Action Plan may have set the point of reference for e-Procurement applications too high and increased the cost and burden of submitting tenders electronically. The choice of the security level of an electronic signature should be based on a risk assessment of failed identification/signature solutions in the context of procurement".

The Green Paper conclusion is also revealing in its language: it could have been more appropriately worded in terms of setting the point of reference 'too narrow' rather than 'too high' recognising that other methods can be equally or even more adequate and fit-for-purpose, and reveals an entrenched myth that anything which is not PKI is ipso facto of a 'lower' quality. In reality there are good reasons to expect that some simpler alternatives may be of higher quality than PKI. The same language can be found in the EU Procurement Directive 2004/18/EC that requires enhanced measures for e-communications, by providing that the EU E-Signatures and E-Commerce Directives apply to e-communications, but that "public procurement procedures.... require a level of security and confidentiality higher than that required by these Directives" and that "electronic signatures and, in particular, advanced electronic signatures, should as far as possible be encouraged". It is unclear what fit-for-purpose or risk analysis was the basis for this Directive, but the cost has since been acknowledged in terms of slowing the rate of take-up of this technology in the application to procurement. Commentators such as Bickerstaff (in Nicholas 2010) have observed that "a probably unintended consequence of this requirement and other stringent requirements probably implied by the Directives are having a negative impact particularly on the electronic submission of tenders, and that e-tendering is not in fact advancing".

Work is also proceeding in relation to the application of biometrics online, for example in the MERCOSUR Ibero-American Social Electronic Identification Framework (2011) in Latin America. Low or middle countries at the concept stage of e-procurement development are especially at risk of confusion about these issues. One recent example is of a country that has spent an additional three months of local

development to incorporate the PKI model into its developing e-procurement system, and has since acknowledged that in the light of the above discussion it could have simply incorporated a login / password model via secure channels.

### ***Conclusions***

It is common to encounter public officials both in developing and developed country governments, who harbor a belief that the conventional PKI digital signatures used in some government e-procurement systems are indispensable in e-procurement due to the security sensitivity of users of e-procurement, revealing presumptions amongst these officials and even some consultants and advisors that this application of PKI provides security, and that no alternatives of equal or superior performance exist. There is intrinsically a presumption that PKI represents a standard, even the sole standard, rather than a technology.

This issue is not merely academic – public procurement is big business in most modern developing and developed economies, typically accounting for 15%-20% of total national economic activity, and in some low income countries can be much more, and represents a key target area for reform in many governments. The foregoing discussion finds that the PKI based digital signature modality for government e-procurement authentication is not mandatory in terms of business requirements, and the purpose of which can be adequately served by other more cost effective and fit-for-purpose alternative technologies.

The consequences of these misunderstandings have been significant in terms of costs, technical complexities, user acceptance and business utility. In other words, the leading principles, including fit-for-purpose, of UNCITRAL guidelines (2006) are comprehensively not being met, helping to explain the poor take-up of e-procurement systems in many jurisdictions including the EU. The consequences for developing countries and middle income countries in particular is especially of concern where it is recognized that technology is one of the most significant potentials for urgently needed procurement reform in those countries.

Better fit-for-purpose solutions are readily available, and are in use. Some of these address all of the above business requirements, are user friendly and essentially costless.

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## ANNEX 4 – BUSINESS CASE

### *Financial and Non-Financial Impacts*

Potential savings from the implementation of e-Procurement framework have been estimated by the OECD to be in the range of 5-8%<sup>18</sup> of the procurement value. When combined with the greater procurement coordination and management information and control that is facilitated by e-procurement costs have been reported to fall by between 5% and 20%. The increase in competition from e-Procurement may yield substantial savings, through providing greater visibility and ease of access to the government market. Results from the EU include:

#### **E-Procurement Benefits in the EU**

##### *Examples of savings and improvements*

- Italian Emilia Romagna's agency Intercent ER offers e-Procurement services including e-Marketplace, e-Catalogues and e-Auctions and is now the reference point for 539 administrations (90% of local agencies). In 2008 it processed transactions amounting to some € 419 million, delivering efficiency benefits of € 67.5 million and time savings of 45 man-years.
- The Austrian Federal Procurement Agency centralises purchases for federal authorities through e-Procurement functionalities. In 2008 it reported savings of €178 million against a procurement volume of €830 million. Benefits seem to significantly outweigh the annual maintenance costs of €5 million, which are less than 3% of the savings.
- As of 1 February 2005, all contracting authorities in Denmark may only accept electronic invoices. This reform affects approximately 15 million invoices a year, and applies to the entire public sector, from ministries to nursery schools. The use of e-Invoicing is expected to save the public €100 million every year, on top of savings in internal administrative processes.
- In Norway, the Ehandel platform is helping authorities to achieve 20-40% reductions in the time taken to handle orders, receipt of goods and invoicing and delivering price savings in the region of 2-10%.
- In the UK, the Buying Solutions site reported in its 2008/09 annual report that it had facilitated sales of over £5 billion, delivering £732 million in savings. The UK also reported savings frequently exceeding 10% (and even up to 45%) through the use of e-Auctions and recently announced plans to use e-Auctions to save the taxpayer up to £270 million by the end of 2011.
- A Portuguese study compared the best bids for public works contracted by 50 Portuguese public hospitals in 2009 (using paper based systems) and 2010 (using e-Procurement). It concluded that a cost reduction of 18% had been achieved in 2010, due to the increase in competition generated by e-Procurement.

Source: EC Green Paper on expanding the use of e-Procurement in the EU (2010)

In the state of Andhra Pradesh where an e-Procurement system was launched in 2003, tenders processed through the e-Procurement platform in the pilot phase during 2003-04 reported a reduction of 16% in price quotations<sup>19</sup> in comparison to

<sup>18</sup> OECD/DAC (2003). Mainstreaming the Procurement Function into the Public Expenditure Policy and Effectiveness Dialogue (OECD/DAC). World Bank Roundtable, Paris, 22-23 January. [On-line]. Available at [www.oecd.org](http://www.oecd.org)

<sup>19</sup> E-Procurement in Government of Andhra Pradesh, India. World Bank case studies available online at <http://go.worldbank.org/W7W2AC3GS0>

the previous year when procurement was manual. Some savings can be realised in terms of hard cash, while others may save time but not be cashable.

The Office of Government Commerce (OGC) in the UK reported transactions savings of £41 per transaction for small value off-the-shelf purchasing systems, which free up significant amounts of staff time, reduce order error rates and substantially reduce off-contract ordering (known as ‘maverick purchasing’)<sup>20</sup>.

The Korean Government has reported “significant cost savings, a 5-fold increase in productivity, and drastic reductions in corruption. The governments of Chile and Andhra Pradesh reported savings ranging from 3%-20%, and Andhra Pradesh reported reduction in tender cycle time from 130 days to 32 days. The Government of Kazakhstan also reported significant savings from its partly developed system<sup>21</sup>. The Government of the Philippines has reported savings shown in the Table below.

**Estimated Savings by the Government of the Philippines as a result of posting its Procurement Opportunities onto its e-Procurement System**

Savings	Items
53%	Various drugs / Medicines
43%	Equipment for electrification projects
42%	Printing of letterheads
33%	IT equipment & supply / delivery of construction materials
25%	Supplies / Material Services
19%	Construction supplies, IT equipment
17%	Electrical / mechanical supplies & equipment
15%	Various office supplies / equipment
15%	Office Supplies / Materials
11%	Vehicles and Supplies / materials

Source: Philippine Government E-Procurement Service

A caution applies to all of these results, insofar as they are often reported by stakeholders themselves. However, in the light of the magnitude of public procurement, even the most conservative savings estimates dwarf the costs of implementing e-Procurement.

Alternatively, a cautious approach to developing a business case may elect to dismiss *all* savings claims. The business case will nevertheless remain compelling in terms of other benefits: transactional efficiency savings, standardization of the procurement practices, and price reductions, are only a part of the agenda. E-Procurement can also automate many procurement processes including supplier selection for some sorts of procurement, and opens the way for new efficient procurement methodologies that can increase market access and competition and also decentralise much procurement down to the point of service within the government (such as in schools). Benefits have been reported in terms of:

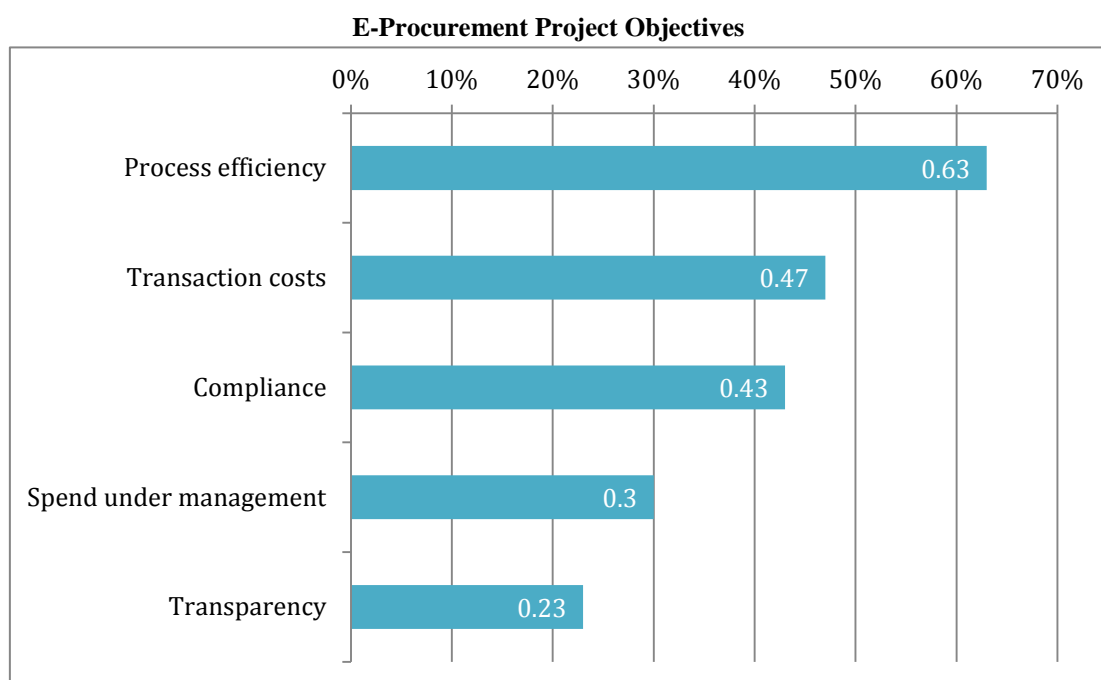
<sup>20</sup> OGC e-Procurement in Action (2005)

<sup>21</sup> Kazakhstan Centre for E-Commerce, April 2011.

- Reduction in inventory value of up to 80%;
- Reduction in maverick buying – improved compliance of 30%;
- Reduction in errors due to elimination of manual processes;
- Reduction in purchase-to-pay processes by 90%;
- Reduced procurement cycle time by up to 80%;
- Improved relations with suppliers who in turn have benefited from reduced transaction costs and improved efficiency;
- Improved analytical capacity and management control.

Equally important is the potential of e-Procurement to strengthen governance through its capacity to enhance transparency and improve access to management and audit information. Many of the benefits of e-procurement are equally applicable to government and the business sector – efficiencies for government are also efficiencies for the private sector: the value of e-procurement for suppliers both in terms of efficiency (market access, ease of bidding, document transfers, transactions) and market information, drives the take-up of business technologies through the wider economy.

Similarly, the Aberdeen Group reported (March 2008) that public sector enterprises have significantly improved their performance as a result of e-procurement initiatives with lower transaction costs, lower maverick spend, and lower transaction cycle times. Automating the order-payment cycle has led to reductions in manual processing of procedural error-prone tasks, allowing staff to focus on more productive activities. The Figure below shows some of the targeted benefits from e-procurement projects: this refers to the number of responses to survey questions, rather than the level of benefits.



Source: Aberdeen Group 2008

A World Bank survey (2007) of fourteen countries where e-procurement had been introduced, found that users of e-Procurement were almost equally divided between those that considered the primary benefit of e-procurement was in terms of transparency, and those that considered efficiency as the primary outcome.

Qualitative benefits reported from users included:

- Reduced time for the procurement process
- Improved access to procurement opportunities via a single national portal
- Improved transparency of the process
- Reduced errors in process and documentation for buyers
- More sophisticated market intelligence
- Increased market access

E-Procurement has, in some countries, eliminated at least one form of coercion – specifically the practice of physically preventing competitors from approaching and depositing a document in the bid box.

### ***Methods***

Technology opens the way for the efficient application of procurement methodologies such as e-auctions, e-markets, and e-framework agreements, and also enables the deployment of efficient e-purchase cards. The low cost efficient access to management information in e-procurement enables the strengthening of control, oversight, efficiency and planning capabilities as well as competition.

An international trend in procurement performance and the evolution of procurement governance is partly being driven by e-Procurement. Parts of these potential gains in productivity come from the ability to engage more effective procurement methodologies through technology. In particular, e-quoting that samples the entire business sector becomes easy. E-framework agreements are more efficient to access and drive the decentralisation of procurement further than is otherwise possible.

### ***Transparency, Reporting and Assessment***

The potential for e-Procurement to strengthen transparency (an essential component of accountability) has been reported in research for over ten years. Technology reduces the marginal cost of management and audit information from high to almost zero. E-Procurement also provides more significant and timely procurement information that creates the potential for regular analysis and reporting for many stakeholders. This information aspect cannot be expected to function effectively in the paper environment. Examples include:

- Spend analyses by department provide the intelligence for strategic procurement development;
- Management of whole-of-government framework agreements should require standardised reporting on a weekly or daily basis in an analytical format;
- ‘Buy-local’ industry development policies require spend analyses to review programme effectiveness and compliance;
- Open-markets and cross-border trade policies often require spend analyses, potential savings and levels of cross-border trade;
- Audit of procurement activity requires timely access to information from numerous widely dissipated small value transactions.

Access to accurate, timely and comprehensive spend data provides intelligence on spending patterns, inventory, performance and compliance. This information can help identify efficiency opportunities and market opportunities.

### ***Pakistan Benefit / Cost***

In summary, it is clear that the business case for e-Procurement should include a range of qualitative and quantitative aspects. These are shown in the following Table, where the Indicators provide quantitative estimates in several cases. Where quantitative estimates are not able to be determined this does not mean that the factor is unimportant – there are compelling reasons why some of these qualitative factors are likely to be more significant than any of the quantitative factors.

**Pakistan Summary Impact Assessment for E-Procurement**

No.	Factor	E-Procurement impact	Direct Stakeholders	Indicators for Pakistan (National)
1	Prices	Reduced 5-8% in competitive markets	All public entities	1% is estimated at approximately Ra 7000 million / year in prices
2	Transactional efficiency	Reduced 65% for simple procurement	Firms, public entities, public	Simple low value procurement is commonly 20% of total procurement, and transactional cost is estimated to be 25% of the price. Savings of 10% is approx Ra 3450 million / year
3	Procurement cycle times	Reduced 25-75% for complex procurement Reduced 80-95% for simple procurement	Community	1 month reduced cycle time for infrastructure budget
4	Compliance	As for maverick buying 30%	Departments, PPRAs, firms	
5	Delegation control / Decentralisation	Up to 100% simple procurement	Departments, firms,	
6	Transparency / Illicit practices	Substantial reduction reported	PPRAs, audit, firms, departments	Similar to 1 & 2 above
7	Spend coordination X maverick buying	Increased 30%	Budgets, firms	Similar to 3 above
8	Audit capacity	100% for parts of procurement cycle	Auditor, PPRAs	As for 6 above
9	SME / business development	Online business enablement 25%	Firms	Technology take-up in Australia estimated up to 60% of GDP growth

10	Inventory value	Reduced 70%	Budgets, departments	
11	Training requirements	Reduced for common functions	Departments, PPRA's	

The above discussion refers to the benefits of a well-conceived, competently implemented e-Procurement strategy. Benefits have been described in qualitative and quantitative terms. The qualitative benefits are not readily measurable, however the reported quantitative results include savings ranging between 5%-20%. With public procurement accounting for between 15%-20% of the national economy, this level of savings potential is substantial and the benefit / cost ratio should be substantial even without considering the qualitative benefits.

A range of other procurement issues in Pakistan would also be significantly addressed by a good e-procurement system. Examples include that:

- There are problems in the quality of national bidding, and even the larger bidders are often not well-prepared, being short on capacity and guidelines for preparing bids – digital documents could assist with this. There is a dominant reliance on newspaper notices and advertising. Online postings are mandatory but compliance is poor, and advertising often happens on non-business days, in obscure local newspapers that escape audit and monitoring, and reduce competition
- There are no national or provincial statistics on procurement other than what can be deduced from financial reports.
- Procurement planning is reportedly often poor. Ideally, specifications should be approved when a project is approved, so procurement can start immediately. This does not often happen. Procurement plans are developed but not in standard formats
- Blacklists are maintained by individual entities in isolation
- There are some imperfect standard documents for engineering, and few tools for contract management – varies by jurisdiction. There is limited or no standardisation of major assets such as locomotives, so multiple inventories are maintained
- Major challenges with ICB including litigation around the specifications as to whether these are biased. Billing is also a very frequent problem.
- PPRA's do not have well developed sets of Key Performance Indicators for the management or monitoring of complex procurement
- Each PPRA responsibilities end with the signing of contracts
- Government of Sindh departments and agencies are reportedly strictly complying with PPRA regulations and any violation is being penalized and enforced in terms of rule 45 and cases of violations are being referred to provincial anticorruption agency.
- Lack of transparency, and consultation with private sector seems to be a major issue. An opinion was expressed that there is little trust of the public procurement system amongst many private sector entities. It was advised that payment of commissions is common

- Bidding was time consuming, slow and expensive, and competition in some sectors is limited and shrinking
- Grievance redressal is considered to favour agencies and is avoided by many businesses. Nevertheless several agencies reported large numbers of complaints are made
- Time taken from bid opening to award is reportedly “never followed” and a recent bid submitted in one of the departments was opened in December 2013 and the participants are still waiting for award decision.
- There is a “huge trend” of supplying low quality products and smuggled ones with low costs dealt beforehand.
- There is no plan available before hand on the basis of which suppliers can prepare its business plan for the year. PPRA publishes few organizations plans with different formats.
- The Pakistan Engineering Council (PEC) was of the opinion that there is lack of political will and lack of interest in any reform initiative due to corruption in Pakistan. In Pakistan multiple agencies are preparing bidding documents whereas mandate lies with PEC in case of engineering and construction works. This leads to confusion. There is also a lack of any standards for categorizing consulting firms.
- Sindh Irrigation informed that major challenge would be quality assurance. Access to new contractors is not restricted however if e-procurement introduced, it will definitely improve competition and introduce fairness. With regards to participation, on average 20-30 contractors compete for bids with Sindh Irrigation. There are also numerous complaints relating to procedural issues. Concern expressed with regards to data security during the e-procurement and whether sufficient data security will be available to safeguard in process tender award.

The cost of an e-procurement development can be expected to range from around USD0.6 million up to USD3.5 million. Malpractice, a flawed strategy, or poor management in the development and implementation of e-Procurement can multiply this cost several times.

The ‘case against’ e-Procurement is essentially one where there is likely to be poor strategic and implementation skills making the exercise one of high risk. There have also been cases where users on both sides of the market have raised objections. The reasons for these have included resistance to greater transparency and competition, or simply a reaction to change. There can also be concerns about data security and fraud (the risks of security and fraud are, however, generally greater in a paper-based environment).

## ANNEX 5 – NON-FUNCTIONAL REQUIREMENTS

The following issues are characteristics concerning the technical standards of the online management system:

### *Usability*

Non-functional requirements originate from system properties, such as environmental or implementation constraints (e.g. remote access should be provided, software must run on various operating systems) and qualities of the system:

#### *Application Graphical User Interface (GUI)*

Procurement officers of a department utilize such systems only when creating a notice inviting bids, or when managing their existing bids. Depending on the size/type of a department, and the frequency of its purchases, the utilization of the system can be as rare as a few times every year, while suppliers use such systems only when participating in a particular bid, which may also occur very rarely. The user interface of such a system needs to be intuitive and operational in all popular Internet browsers, while technical prerequisites for their accessibility should not impose significant limitations to suppliers. The functionality made available to users, should be self-explanatory and assistance should be always available, helping to understand the steps they need to follow, taking advantage at the same time of all functionality offered by the system.

#### *Graphical User Interface Interoperability*

The technology used for GUI implementation of an e-Procurement needs to be chosen primarily based on a single criterion; the level of accessibility. Several state-of-the-art GUI implementation techniques have emerged, allowing system developers to implement GUIs in a simpler and/or more efficient way. Nevertheless, not all new technologies have set standards, or may not be supported in exactly the same way by Web browsers, Operating systems, etc. This obviously is an undesired effect, which substantially reduces the level of accessibility. It is therefore **recommended** that the GUI of e-Procurements be based on widely accepted technologies. For instance, all commonly used Web-browsers support the HTML 4.01 standard. Therefore, a GUI of an e-Procurement constructed in HTML 4.01 reduces accessibility considerations to other, non-functional issues.



### ***Search engine***

Advanced search facilities should be provided to all users of a public e-Procurement. These should allow all users (including anonymous, non-logged-in users) to use the search functionality for all available notices inviting bids, and to identify those of potential interest to them. Searches and notifications should also interface with mobile technology. A predefined set of the most important data in a notice inviting bids, (including its name, CPV codes, keyword, and location) can be made available as search criteria, as well as the option for end users to combine these criteria. Advanced Boolean logic operations (AND, OR, and their precedence) may also be provided, allowing users to execute refined searches. The system can allow users to define the fields used for displaying the results of a search and the sorting parameters used. Furthermore, users can be given the possibility to select a particular bid invitation from the search results, and view its details. Depending on the details and status of a particular call, suppliers can be presented with the appropriate activities to perform.

The system may utilize an external search engine so as to take advantage of the features offered by a specialized search engine, such as support for UTF-8 character encoding, content-based search, support for searching content stored within several popular types of documents (doc, xls, pdf, plain text, etc.).

### ***Linguistic/Multi-lingual Requirements***

Users may be provided with the functionality to select their preferred language for the Graphical User Interface (GUI), from the supported languages, as well as being able to switch from one language to another. With regards to the User Interface and the language used, all descriptions should best be placed in an easily customizable and parameterized format (e.g. property file or database table), so that they can be translated if there is future need to export the User Interface to another language. Additionally, the fonts used in the application should use all the glyphs for all official languages of a jurisdiction.

In principle, two parts of e-Procurement localization should be considered:

- Language: the User Interface needs to be capable to display data in any of the languages supported by the system (if more than one language is provided) allowing users to set their preferred language from a user profile screen.
- System character encoding: system character encoding is the method for encoding text entered in any input fields. UTF-8 (Unicode) character encoding can be supported for non-Latin characters. The database might also need configuration for UTF-8 to work. For instance, older versions of MySQL did not support Unicode, it was however possible to configure JDBC drivers to use Unicode when

handling texts. Most of the databases and user input interface components today support Unicode.

### ***Online Help***

Online help can be offered, providing assistance at any time to users performing activities in the system. “In-context” sensitive help, user manuals, wizards, walkthroughs, and online demonstrators can significantly assist users to understand the functionalities of the services offered by the system. Online help documentation, glossary, and FAQ (Frequently Asked Questions) can provide fast and easy access to clear definitions for all the fields used (what they represent, what they measure, etc.). User guides can explain in detail the GUI of the e-Procurement, for example using screenshots and detailed textual descriptions. The FAQ can provide answers to the most commonly asked questions from users.

A successful e-Procurement process depends heavily on the correctness of the data submitted by users of the system. The validity of all data submitted by users through completed Web forms can therefore be checked to promote self-help.

This can be done at both the server and the client sides:

***Server side:*** when the validity of data provided by a user is verified on the server side and the values are invalid in any way, users can be prompted to access the same entry form again, with descriptive warning messages next to the field(s) improperly completed.

***Client side:*** when the validity of data provided by the user is verified on the client side, the browser uses business logic in order to locate and explain the errors to the user. With this check, error messages need to be shown to the users. In Web-based technologies, this implementation may however create interoperability issues, as JavaScript or other client-based scripting languages will need to be enabled.

E-Procurement systems may also inform users performing “significant” activities (that is create a Call, submit a Bid, etc.) using informative/confirmation pages and automated notification mechanisms. All online help facilities can be made available in all languages supported by the system.

### ***User Security & Administration***

User profile management involves the management of user profiles including secure storage of user personal details, while authorisation identifies different roles a user can undertake within the e-Procurement system. Authorisation levels are defined at the system level and also at the workflow-based specific process level. All workflow activities must be stored in an audit log. Workflow activities will be based on an Authority Register as part of the Buyer Register, which stores the user permissions to carry out authorised procurement activities.

It should be mandatory to store the user credentials and profiles in an encrypted and secure manner, which cannot be decrypted by database administrators.

The e-Procurement system should provide for Single Sign-On (SSO) capability for the users to logon once and be able to access all appropriate services in e-Procurement based authorisations created for the user in the system. The e-Procurement system needs to facilitate access to content and services based on type and use of the content made available through the system based on users' roles.

The e-Procurement system should support industry standard methods of user registration and authentication.

Two options for user registration and authentication are as follows:

#### ***Option #1: User Id & Password***

User registration based on user id and password is the prevalent approach in many countries such as UK, Australia, Canada, USA, Singapore and most commercial applications including the banking industry. This approach is acceptable under the UNCITRAL Model law on digital signatures (2006). For e-Procurement, user id and password can be as robust and reliable as any other method, including PKI. From the aspect of e-Procurement the only difference is that the access codes have been verified to be associated with an entity or individual. When users register online this verification does not usually occur at that point, but rather can be established at the due diligence stage which needs to occur in most cases of government contracting anyway. However, in some commercially sensitive systems, online verification also occurs and verifies the user id registration. Digital certificates under PKI have the same vulnerabilities (theft, etc) as user id and password registration for e-Procurement.

There may be concern that without pre-bid authentication an entity could submit many bids and repudiate all but the best winning bid, however this can easily be managed through a well-designed registration system, and PKI has not prevented this.

The process of user id creation including submission of user credentials for registration and authentication should be performed using a secure SSL connection. The requirements of secure transport and storage, and data integrity are also addressed.

#### ***Option #2: Digital Signature Certificates***

Some countries permit authentication for e-Procurement only through a digital certificate and PKI. This approach is based on the earlier UNCITRAL Modal law for digital signatures (1996). This approach is used in parts of the EU, and much of Asia. Digital certificates tend to be costly and imposing these as a requirement for participation in e-Procurement discourages small businesses, as well as being bureaucratic and in some instances more vulnerable to corruption. Also, entities that sell digital certificates often have inferior authentication capabilities compared to governments. Where countries want to adopt the first Option but are

encumbered by the older legislation then the approach can be for the entity managing the e-Procurement system to also be the entity that issues digital certificates, which can take place online at the time of registration.

### ***User Profile and Authorisation Management***

User profile management involves the management of user profiles including secure storage of user personal details, while authorisation identifies different roles a user can undertake within the e-Procurement system.

The user profiles are stored in a relational database, which identifies all the system users and the roles that are associated with the system users. It is important to store the user credentials and profiles in an encrypted and secured manner, which cannot be decrypted by the database administrators.

### ***Information Communication, Interface and Storage***

The use of "server certificates" is advisable for supporting secure communication over an encrypted SSL session, between e-Procurement users (web browser used by the procurement entities and the suppliers) and the Web Server of the e-Procurement.

### ***Storage***

Since e-Procurement deals with sensitive information (e.g. bid responses, commercial information etc), it is essential to encrypt stored data in its various modules (database, LDAP or file system) via a recognised encryption algorithm. Such a feature increases system security and protects data even where an unauthorised person has physical access to the hosting server(s).

The security systems implemented for e-Procurement should ensure secure storage of documents; bids uploaded in the system and should not be accessible for any user until the completion/achievement of specific milestones defined for bid processing and such contents should not be stored or transmitted in clear text at any point within or outside the e-Procurement system. The encryption should be implemented on end-to-end basis from the end user node till the documents are received by the web server and stored in the e-Procurement system.

The e-Procurement system should implement an antivirus gateway for scanning all the incoming documents/communication from the users and should restrict communication of any unauthorised/malicious content. No document / communication (e.g. e-mail) should be received and stored unless screened for viruses.

### ***Time-stamping***

A secure and reliable time-proofing mechanism should be implemented for dealing with issues such as whether a bid was submitted before the bid submission deadline, etc. The e-Procurement system should record the exact date and time for all activities taking place and obtain such time from the source defined for the system.

Time can be obtained using the Time-Stamp Protocol and a Time-Stamping Authority (TSA) issuing time-stamps associating a unique date and time with any action in the e-Procurement. The digital time-stamp can be used to prove that an electronic document was transmitted to the procurement server at the time stated on its timestamp. The e-Procurement system can continuously synchronize with a TSA, through the reception of broadcasted time signals. Through this mechanism the audit trailing implemented in e-Procurement can use an accurate time-stamp to record all activities performed.

All documents can be time-stamped on the server side immediately after the completion of their transmission from the client site. Electronically signed documents can be associated with a strong time-stamp, if sent to the TSA, which stamps documents with a legally robust date and time.

### ***Reporting, Logging and Monitoring***

Extensive audit trail facilities should be implemented for every electronic procurement and administration activity performed through the system (e.g. track bid uploading/downloading, versioning, approvals). Inspection of auditing logs can provide information to effectively detect attempts of intrusion, for example tampering with the bid documents by an authorised user after the submission deadline. The data archival mechanism implemented for e-Procurement should also ensure archival of audit logs to support in case security incidents or disputes need to be investigated (thus providing for non-repudiation). The access to the audit trail data should be restricted for unauthorised tampering/changes/deletions.

### ***Interoperability***

The importance of technical interoperability in an e-Procurement environment means that an e-Procurement should have appropriate open application interfaces to support the interaction between various operational systems, as well as systems and applications under development. An e-Procurement can be realized in a way that enables interoperability with existing legacy systems, allowing the re-use of existing systems and minimizing costs. To address interoperability requirements, e-Procurements should employ the following strategies:

Service Oriented Architecture (SOA): SOA is concerned with the independent construction of services which can be combined into meaningful, higher level business processes within the context of an application system like e-Procurement.

SOA describes several aspects of services existing within an application:

- The detail ('granularity') and types of services (granularity refers to the size or extent of functionality in a given interaction).
- How services are constructed
- How services are combined together
- How services communicate on a technical level
- How services interoperate on a semantic level.

By applying the SOA paradigm to the design of the core components, e-Procurement system implementers can ensure a significant improvement in system flexibility, while at the same time business components are re-used. This consideration needs to be part of the e-Procurement system design phase.

Open international XML based communication protocols (SOAP and XML-RPC): XML-based communication protocols should be utilized when cross-platform interaction is required. Furthermore, SOAP and XML-RPC are standard components of almost all environments, constituting two protocols to enable remote cross-platform communication in a standardized and convenient way

Integration capabilities depending on the specific development framework used: depending on the development framework used, e-Procurement system should be designed in such a way that future interoperability capabilities are enhanced through the adoption of the appropriate standards. One of the popular options is the use of J2EE. The J2EE Connector Architecture (JCA) for the J2EE framework for instance, can assist in establishing an environment for secure system interoperability. JCA defines and enables a standard way for connecting J2EE based applications to heterogeneous Enterprise Information Systems (EIS). EIS comprise Enterprise Resource Planning (ERP) systems, database systems and various legacy applications. Furthermore, JCA offers a set of scalable, secure, and transactional mechanisms to enable connectivity to EIS and there is a substantial market of JCA adapters to simplify integration of enterprise applications.

### ***Risk Management and Security***

Risk management and security are much more than technical issues. The e-Procurement systems and management should be administered under an adequate governance framework to ensure security. This requires not only that the security tools (firewalls, encryption, time locks) are in place but also that the management around the system is secure. There are international IS risk audit standards and methodologies that apply, such as those published by the Information Systems Audit and Control Association (ISACA) that link with organization-wide risk management concepts and approaches, such as COSO ERM, ARMS and ISO 31000. The system should be regularly audited against these international standards. Where systems are provided from an external source (for example a Cloud<sup>22</sup> service) then issues arise

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<sup>22</sup> "At the time of writing, there is no comprehensive and commonly accepted standard to address the technical risks in cloud environments. There does exist, however, a hierarchy of approaches such as checklists and scenario generation techniques that require the user to have only a minimum knowledge of information systems security. To have a well-defined scope for the checklist, cloud managers can follow the formats that are provided by British Standards or the US National Security Agency (NSA). The NSA suggests using 18 areas for information security assessment, which is more comprehensive than the British Standards. It is

such as transparency of controls – requirements in the service level agreement (SLA) are the key to managing risks of external providers and need to be consistent with international standards of risk management.

Other issues are in relation to support, reliability and suitability of the software and hardware such as:

### ***Reliability***

The degree of reliability of a system can be assessed in relation to the reliability of its components, allowing reliability requirements to be expressed at the component/unit level, rather than entire system level.

Probably the most critical event is during the closing stages of Bid submission for Bidders (the e-Bidding phase). Before the end of e-Bidding, suppliers are required to access the system to submit their Bids. However, it is common practice for suppliers to submit their Bids towards the end of the Bid submission deadline. Additionally, depending on a specific notice, a Bid may be composed of several files. This in turn can result in megabytes of data that need to be transferred from the IT environment of the supplier to the e-Procurement, and stored in the appropriate secure servers. The combination of these parameters signifies that the e-Bidding closing period for each notice can potentially cause failures due to volume capacity problems. Furthermore, an e-Procurement may be harmed by disruptive events, including Internet connection failures, malicious attacks, power failures, system software/hardware failures, etc. System implementers must ensure that their systems can handle these issues, while plans must be in place for handling critical failures, in the form of Business Continuity and Disaster Recovery Plans.

Reliability requirements are related to the quality of a system, and are usually defined quantitatively. Reliability measures are listed in Annex 6.

### ***Scalability***

The e-Procurement system should be designed to meet significantly larger transactional load than initial requirements. The efficiency with which this can be done in terms of cost, time, quality, etc., determines the scalability of a system. Good scalability for a system can be achieved through effective software architecture and/or adequate hardware components.

### ***Performance Assessment***

A system that can handle and respond promptly to any user request, can not only accelerate the e-Procurement activities, but also assist users to better understand the different functionalities offered by the system.

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suggested to follow the NIST's guidelines for ranking threats, use NSA's 18 areas of information security assessment, and use checklists for vulnerability assessments that can lead an organization to estimate probabilities of the occurrence of incidents and quantify information security risks" (ISACA 2011)

Naturally, there may be activities that inevitably require significant time (e.g. uploading of documents). In such cases, system implementers need to ensure that users are informed of the progress of their requests, avoiding events such as users cancelling their activities or being unsure of the status of their actions. Obviously the performance requirements of an e-Procurement are dependent on the expected number of users and bids. System implementers need to plan for software/hardware scalability and establish systems that can achieve the predefined performance goals.

System performance metrics are listed in Annex 6.

The response times for testing the performance of an e-Procurement must be measured in a database that has pre-loaded a considerable amount of data, simulating the performance of the system in real conditions. In addition, actual use of the system will have to be simulated including concurrent data uploads and downloads.

### ***Hardware***

Hardware requirements include a dedicated set of servers, disaster recovery and a secure Data Centre capable of delivering the reliability, service and risk management as set out above. These requirements depend partly on what existing infrastructure is already in place, the estimated demand and the operating environment.

#### ***Data Centre***

The Data Centre should have dedicated web, application and database servers, as well as other supporting servers (such as a log storage server, domain controllers, and time stamp server). For the high availability requirements of the system, servers are used in pairs and configured for failover support. Redundancy in the source of Internet connectivity is highly desirable for uninterrupted availability of the e-Procurement system to its users.

A Disaster Recovery Site (DRS) is required, which should include an uninterrupted Internet connectivity and backup electrical power supply.

A disaster recovery is a response to a declared disaster. It is the restoration or recovery of an entire application or system. Disaster recovery is becoming an increasingly important aspect of enterprise computing. As devices, systems, and networks become ever more complex, there are simply more things that can go wrong. As a consequence, recovery plans must be in place for business continuity.

The e-Procurement platform can be stand-alone or co-located in the hosting environment of an existing Data Centre with additional hardware, software, adequate Internet connectivity bandwidth, management process, and management skills. There needs to be redundancy in the system to ensure backup at all times. The creation of an e-Procurement support centre would be desirable.



### ***Internet Connectivity***

Internet bandwidth should be adequate as well as accessible 24/7 for providing access to e-procurement system for its users. While using the system there will be requirements for uploading and downloading scanned files of large size. Generally businesses and government have good access to Internet services.

### ***Security***

An e-procurement system and Data Centre should be designed as a complete network security solution including authentication, authorisation, data privacy, and perimeter security. Physical access to IT information processing, storage areas, and storage devices and the supporting infrastructure (communications, power, and environmental) should be controlled through prevention, detection, and minimizing unauthorised or unintended access to these areas. The use of e-signatures rather than digital signatures has been strongly **recommended** above. This latter approach would be more consistent with business practice, is less complicated and less expensive and is common in some other countries.

## ANNEX 6 – RELIABILITY AND PERFORMANCE MEASUREMENT

### *Reliability Metrics*

**Mean time between failures (MTBF):** measure of the average time between failures. As an example, if there are 8,760 hours per year (365 days x 24 hours per day) then the MTBF of the system can be divided by 8,760 to identify how long the system will run in years. A system with a rating of 30,000 MTBF would on average run 3.42 years without a failure.

**Mean time to repair (MTTR):** measure of the average time required to perform corrective maintenance on a system in the event of a system failure. As the value for MTTR approaches zero, the availability of the system increases to 100%.

**Probability of failure on demand (POFOD):** measure of the likelihood that the system will fail when a service request is made. As an example, if POFOD equals 0.01, this means that 1 out of every 100 service requests results in a failure. This is relevant for e-Procurement operating non-stop.

**Rate of fault occurrence (ROCOF):** refers to the frequency of occurrence of unexpected behaviour. As an example, a ROCOF value of 0.02 means that 2 failures are possible every 100 operational time units.

Because some functionalities of an e-Procurement system are more critical than others, reliability requirements may be restricted to the most important ones. For example, the reliability of Bid submission and Bid locking modules should typically be higher than the module used for creating a Contract Award Notice. When defining the metrics for the reliability requirements, the Government needs to specify the system conditions. For instance, the reliability of any IT system usually depends on the user request load, and may decrease when the number of simultaneous transactions/requests increases. Therefore, reliability and scalability are closely related.

An e-Procurement system needs to be easily accessible, guaranteeing minimum disruptions to e-Procurement competitions, not compromise confidentiality of data and security at any time and ensure transparency and non-discrimination at all times. These requirements can only be fulfilled by a highly reliable e-Procurement. The government needs to specify the reliability requirements according to its expectations. During the development phases, a wide range of testing techniques (including unit testing, integration testing, factory testing, stress testing, etc.), may be employed to ensure the good quality of the programming code. Moreover, apart from realizing as reliable systems as possible, the government is **recommended** to establish mechanisms for handling potential system disruptions, in the form of Business Continuity Plans and Disaster Recovery Plans.

The availability of an e-Procurement can be improved through identification of the system components. If one component is prone to failure, the entire system will be prone to failure too.

An e-Procurement is usually composed of three elements:

- One or more servers, where most of the data is processed and stored.
- A client, making requests to the server
- The network, which allows for the communication between the client and the server

All three elements can be broken down into components, such as hardware, software, processes, procedures, etc. All these components need to be checked for their reliability, in order to guarantee the availability of the system. More specifically, the hardware making up the system includes, among others, the following components that need to be checked:

- Central Processing Unit
- Storage devices
- Input devices (keyboards, serial ports, mice, etc.)
- Output devices (monitors, printers, etc.)
- Cables

The software running in the system generally includes the following components, all of which need to be reliable:

- Firmware embedded in the hardware (BIOS) to allow it to communicate with the operating system
- Operating systems, such as Windows, Linux, etc.
- Programs used by administrators or maintenance staff for performing control functions and data housekeeping
- Applications performing specific tasks or operations depending on the user
- Middleware programs supporting communication or data exchange

The processes needed to run the system will typically include:

- Power-up and system initialization
- Network management and operation
- System monitoring
- Backup/restore and archiving
- User managements, including security
- System shutdown

When all relevant system components are identified, the following approaches can reduce the risks associated with critical components, namely those that are a single-point of failure for the system:

- Reduce the frequency of the system not being operational by looking for ways to prevent outage from happening to critical components
- Minimize the duration the system is not operational by trying to prevent outage from happening to critical components and reducing the number of critical components that may be affected by an outage
- Reduce the parts of the system that are potentially affected by an outage.

System developers can quantitatively measure availability, by following certain approaches and at regular intervals calculating values for the degree of availability achieved, in order to set targets for improving the availability values. An indicative calculation for quantitatively measuring availability is provided as follows:

- **Hours the system should be available in a month:** 24 hours per day x 7 days x 4.33 weeks per month (on average) » 720 hours / month
- **Hours the system was down in a month:** Consider 5 hours due to corrective maintenance (e.g. correction of software defect), 3 hours due to perfective maintenance (e.g. hardware upgrade), 1 hour due to hard disk failure, and totalling 9 hours of unavailability
- **Net availability:**  $((720 - 9) / 720) * 100\% = 98.75\%$
- **High availability:** 3 out of the 9 hours were due to maintenance activities and only 6 hours (5 + 1) were due to failures. Therefore, high availability is  $((720-6)/720)*100\% = 99.16\%$ . Commercial grade availability is often five-nines – 99.999%.

### *System Performance*

The following definitions are commonly used for measuring performance:

- **Simple Query:** a query accessing a single database table or a join of two tables
- **Complex Query:** a join of three or more database tables
- **Report:** a report ready to be printed, produced by PDF generation on the server, reporting tool plug-in or any other technology applicable
- **Document Management:** uploading, downloading and opening of a document to/from the document library of the system to the client workstation
- **Active User:** a user of the application performing constantly typical operations
- **Response Time:** the period of time from the moment the user initiates an action (e.g. by clicking on a button or a link) until the moment a Web-page with the requested information or update confirmation message is completely downloaded and displayed on the screen of the user. Response times can be effected by Internet latency; therefore response time is commonly tested in a Local Area Network (LAN) environment.

Example performance goals can be:

- At least 50 concurrent active users with maximum response time
- Up to 200 concurrent active users with 10% increase in maximum response time
- Maximum response times that return up to 200 result rows is X. For every additional 100 results, the maximum response time may increase for up to X seconds.

Maximum response times (in a LAN environment) can be:

- 90% of simple queries to have a maximum response time of 2 seconds.
- 99% of simple queries to have a maximum response time of 5 seconds.
- 95% of complex queries to have a maximum response time of 5 seconds
- 99% of complex queries to have a maximum response time of 10 seconds
- 95% of reports to be generated in less than 6 seconds.
- 99% of reports to be generated in less than 15 seconds.

- 95% of document management activities to have a maximum response time of 5 seconds
- 99% of document management activities to have a maximum response time of 8 seconds.

The response times for testing the performance of an e-Procurement must be measured in a database that has pre-loaded a considerable amount of data, simulating the performance of the system in real conditions. In addition, actual use of the system will have to be simulated including concurrent data uploads and downloads.

## **ANNEX 7 – PROJECT RISK MANAGEMENT**

The e-Procurement system is to be delivered on the basis of a public sector-wide service, and as such has potential key risk issues from both an internal and from a client perspective. This Annex provides a draft Risk Management plan that would require refinement by the PMU at project inception and during the course of the project itself to match the context and business model adopted by Pakistan. Active risk management will ensure that client agencies and suppliers are able to benefit from this service in the knowledge that the systems and the practices employed provide an appropriate degree of reliability, efficiency and security. The management of this project and a smooth implementation is essential to maintain public confidence and the integrity of the service. To this extent this risk management framework provides a structured format that reinforces good management practices and aims to minimise unexpected outcomes.

Implementing an e-Procurement strategy is not a simple exercise. Challenges for this strategy will come from both inside and outside of government and can include:

- Misunderstanding by the developer of the true scope of the work, weak project management by the developer.
- A developer that does not understand government procurement and presumes private sector purchasing procedures.
- Assumptions that e-Procurement is simply about technology.
- Weaknesses in government contract management, divided ownership of the programme, rigid processes and regulations, and departmental imperialism.
- Apprehension towards change by public sector staff.
- Confusion over standards or the emergence of competing environments and limited interoperability.
- Etcetera.

There are also significant design and ownership risks. The scope of government procurement is extensive and varied, ranging from the acquisition of minor items such as office supplies through to major construction, telecommunications, defence, hospital supplies and complex services. This supply side, or government procurement, affects thousands of suppliers, thousands of line items and is usually managed by thousands of procurement managers within government.

Risk management templates should be a standard part of the implementation plan. The risk-rating matrix identifies the priority areas around which a risk management plan is required. High priority areas include:

- Central agency timeliness of decision and approvals processes
- Implementing partner coordination and relationship with lead agency
- Timelines – related to budget and scope creep
- Project management expertise, authority and controls
- System scope creep
- Demand take-up
- Pilot agencies commitment

For the risk identification step, the following project or macro level (as opposed to process level) risks have been identified as shown in Table R1. These have been drawn from other e-Procurement projects and amended as appropriate. These should be workshopped and regularly amended.

**Table R1**  
**E=Procurement Project Risk Identification**

Ref	Description of macro threat/issue
<b>Project Steering Committee</b>	
	Strategic focus - Loss of strategic goals
<b>Project Implementation Committee</b>	
	Key personnel – significantly inadequate (-20%)
	Decision responsiveness & timelines – too slow (-20%)
	Inadequate commitment
<b>Project Management Unit</b>	
	Inadequate coordination or working relationship with developer
	Inadequate budget
	Timelines – contractual commitment inadequate
	Expertise – Inadequate management and technical skills
	Controls - Inadequate management scope
	Training - Inadequate or untimely
<b>Budget</b>	
	Insufficient budget for contract management
<b>Timelines</b>	
	Timelines too ambitious or too long
	Timelines too rigid
<b>Implementing Departments</b>	
	Resistance to standardisation / BPR - Significant customization by Department
	Timelines - Schedule inadequate (20%)
	Expertise - Departments lack expertise, champions
	Commitment - Departments lack manager commitment
	Interoperability issues
	Hardware - Delivery delayed, cost creep
<b>Developer / Contractor</b>	
	Developer cannot deliver against TOR / Milestones not met
	Contract specifications disputes
	Developer suffers key personnel loss
	Developer goes out of business
<b>Policies and Legislation</b>	
	Policy development too slow
	Reporting and management information not available
	Legislation / regulations not enacted
<b>Suppliers</b>	
	Suppliers not aware
	Supplier resistance
	Supplier lack of access
<b>Roll Out</b>	
	Take-up does not meet KPI buyer benchmarks
	Take-up does not meet KPI supplier benchmarks
<b>Data Centre</b>	
	Data centre not online
	Disaster recovery not online
<b>Risk Management Plan</b>	

Ref	Description of macro threat/issue
	Risk plan becomes obsolete with new risks emerging, old risks disappearing

These risks are assessed in terms of the likelihood of their occurrence, and then prioritised based on their likelihood and impact, giving the risk rating scale shown in Table R2.

**Table R2**  
**Risk Rating Scale**

Likelihood	Impact				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	Moderate	Significant	High	High	High
Likely	Moderate	Significant	High	High	High
Moderate	Low	Moderate	Significant	High	High
Unlikely	Low	Low	Moderate	Significant	Significant
Rare	Low	Low	Moderate	Significant	Significant

The risk ratings in Table R2 provide the input for the risk management plan.

### ***Risk Management Plan***

The identified risks combined with their risk ratings form the basis for the development of the draft risk management plan shown in Table R3, which is created by identifying what mitigating action is required to reduce or eliminate each risk, who is responsible for undertaking this action, and when do they report on their actions.

**Table R3**  
**E-Procurement Risk Management Plan**

Ref	Description of macro threat / issue	Risk*	Action	Accountable Authority	Reviewing / Reporting
<b>Project Steering Committee</b>					
	Strategic focus - Loss of strategic goals	H	KPIs, milestones to be reviewed and actions initiated	Chair of PSC	Quarterly
<b>Project Implementation Committee</b>					
	Key personnel – significantly inadequate (-20%)	S	Budget prioritisation for consultants, and other public sector staff to be co-opted by PPRA	Chair PPRA	With formation and changes
	Decision responsiveness & timelines – too slow (-20%)	H	KPIs, milestones, monthly reporting to PSC	Chair of PIC reporting to PSC	Monthly
	Inadequate commitment	S	PPRA monitors PIC and reviews membership	Chair PPRA	Quarterly
<b>Project Management Unit</b>					
	Inadequate coordination or working relationship with developer	S	Ensure contractual requirements for both parties. Ensure PMU imposes effective management mechanisms.	Director PMU, monitored by PSC, Chair PPRA	Ongoing



	Inadequate budget	H	Tight project management and controls	Director PMU	Ongoing
	Timelines – contractual commitment inappropriate	S	Tight project management and contractual controls	Director PMU	Ongoing
	PMU expertise – Inadequate management and technical skills	M	PPRA commitment to PMU staffing expertise and occupancy	Chair PPRA	Ongoing
	Controls - Inadequate management scope	H	Ensure good contractual controls, provide PMU with advisory expertise	Chair PPRA	Ongoing
	System training - Inadequate or untimely	S	Change management program and capacity building programmes	Chair PSC, Director PMU	Ongoing
<b>Budget</b>					
	Insufficient budget for contract management	S	PPRA with Treasury to ensure effective resourcing and project support	Chair PPRA	As required
<b>Timelines</b>					
	Timelines inappropriate	S	Review contingencies and de-couple contract costs from timelines	Chair PSC, Chair PIC	Ongoing
	Timelines too rigid	M	Maintain effective reporting to PSC	Director PMU Chair PIC	Monthly
<b>Implementing Departments</b>					
	Resistance to standardisation - Significant customization by Department	H	Form agency committee. Ensure central agency authority is maintained. Also see project management	Chair PIC, PMU Director	Monthly and more frequently as required
	Timelines - Schedule inadequate (20%)	S	PSC to seek commitment from pilot agency heads.	Chair PPRA	At kick-off
	Scope - Customization of process scope	H	Effective project manager controls	PMU Director, PSC Chair	Ongoing
	Expertise - Departments lack expertise, champions	S	Implementation agency training via PMU training unit. Promote champions.	PMU Director, Entity heads.	Ongoing
	Commitment - Departments lack manager commitment	S	PSC to seek commitment from agency heads	PSC Chair	At kick-off and as required
	BPR - Departments lack BPR commitment	H	PSC to seek commitment from agency heads	PSC Chair	At kick-off and as required
	Connectivity - Connectivity delayed / narrow	S	Review / strengthen gateway. MPA to be followed up	Chair PSC	Monthly
	Hardware - Delivery delayed, cost creep	M	Project management controls	Director PMU	Ongoing
<b>Developer / Contractor</b>					

	Developer cannot deliver against TOR / milestones not met	H	Effective ICB with independent analysis. Milestones risk plan & sanctions to be established at contract signoff, expertise of evaluation committee, expert due diligence	Chair PPRA	During contract planning and evaluation
	Contract specifications disputes	M	Use of proven international specifications	Chair PPRA	Contract development
	Developer suffers key personnel loss	S	Contractor with depth of expertise	Chair PPRA	Bid evaluation
	Developer goes out of business	S	Contractual reporting requirements	Chair PSC	Ongoing
<b>Regulations and Legislation</b>					
	Online operational regulations (discussed previously) not prepared	S	Advisory group to identify international practices	Chair PPRA	Quarterly
	Reporting and management information not available	L	Access to full interrogation capabilities of PMIS and standard reporting to be specified	Chair PSC	Quarterly
	Regulations not enacted	S	Review framework agreement functional rollout	Chair PIC	Quarterly report to PSC
<b>Suppliers</b>					
	Suppliers not aware	S	Business training and awareness strategy	Chair PSC	Quarterly
	Supplier resistance	M	Business training and awareness strategy	Chair PSC	Quarterly
	Supplier lack of access	L	Connectivity solutions	PMU	Quarterly
<b>Roll Out</b>					
	Take-up does not meet KPI buyer benchmarks <sup>23</sup>	S	Revise roll out strategy and address issues affecting KPI	Chair PSC	Monthly
	Take-up does not meet KPI supplier benchmarks	M	Revise roll out strategy and address issues affecting KPI	Chair PSC	Monthly
<b>Data Centre</b>					
	Data centre not online	S	Transition solution to be available using existing hardware	Chair PPRA via MPA	Quarterly
	Disaster recovery not online	S	Transition solution to be available using existing hardware	Chair PPRA via MPA	Quarterly
<b>Risk Management Plan</b>					
	Risk plan becomes obsolete with new risks emerging, old risks disappearing	H	Maintain risk plan under review	Chair PSC	Quarterly

**H - High risk, S – Significant risk, M - Moderate risk, L – Low risk**

<sup>23</sup> Listed in Performance indicators

The risk management plan is not a one-off exercise that is undertaken at the planning stage of a project. The risk management plan is of no use unless it is used as a live, working document throughout the project. During the project, some risks will disappear and new risks will arise. Unless the risk management plan is reviewed and updated regularly, the risk management plan will become ineffective. The responsibility for this up dating needs to be assigned, such as in Table R4.

**Table R4**  
**Risk Management Plan Review**

Programmed Review date	Scope of Review	Responsibility	Sign-off & Date
		PMU director, Internal Audit	
		PMU director, Internal Audit	
		PMU director, Internal Audit	
		PMU director, Internal Audit	

Risk management should be on the agenda for project review meetings at the PIC and PSC. A common structured approach is to:

- Identify the obligations of all parties to the project;
- Identify all performance outcomes sought by the project;
- Decide how those obligations and performance goals will be monitored; and
- Develop mitigation strategies.

## **ANNEX 8 - IMPLEMENTATION MONITORING AND EVALUATION**

A Monitoring and Evaluation (M&E) framework provides the guidelines to monitor and evaluate the effectiveness of the e-Procurement implementation project, at the central level and also at the ministry levels. Having a common framework in place for M&E facilitates periodic review of the progress of e-Procurement initiative, thereby providing inputs for informed decision-making. This M&E framework is focussed on the rollout phase of the project. For the development phase the contracted milestones and other programme requirements (such as the legislative timeframe) provide the performance indicators.

The M&E framework is especially important at the early stage of implementation. Benchmarks should be targeted for what proportion of documents and bids should be managed online within 12 months, and similarly what proportion of potential suppliers are registered. If these targets are not reached then it should prompt a quick response rather than allow the rollout to stagnate. The PSC should monitor these results closely and require changes where performance is not achieved.

The M&E framework has several facets, i.e. the outcomes of the programme and extent to which the key objectives are met, the underlying support for realising the project, user satisfaction and the performance of the e-Procurement System (IT Infrastructure and Applications).

The assessment of the realisation of e-Procurement objectives is undertaken through continuous monitoring of certain Key Performance Indicators (KPI), derived from the e-Procurement objectives. This step would involve the identification of KPIs, creating baselines for measurement and measuring of the KPIs.

A list of KPIs is as follows:

- Transparency
  - Percentage of notices publicized electronically compared with baseline (number & value)
  - Percentage of documents publicized electronically compared with baseline (number & value)
  - Percentage of tender competitions accurately disclosed with process electronically stored (number & value)
  - Percentage of invitations to tender that are declared void per year
  - Percentage of contract award results published online (number & value)
  - Number of complaints and clarifications
- Efficiency
  - Average number of bidders compared with baseline
  - Average percentage in transaction cost reductions
  - Average percentage in price reductions
  - Number of framework agreements online

- Average cost of a tendering process for the purchaser and for the supplier
- Percentage of orders or invoices submitted electronically by contracting authorities compared with baseline (number & value)
- Average time used in tender process compared with baseline (minutes, hours, days)
- Average time to process order or invoice compared with baseline (minutes, hours)
- Value for money versus lowest price awards
- Inventory value and turnover
- Integrity
  - Buyer-Supplier relationship profile
  - Buyer price profiles
  - Buyer contract amendments
  - Contract performance metrics
  - Buyer complaints profile
- Development of private sector
  - Percentage of economic operators satisfied with the procurement process compared with baseline
  - Percentage of economic operators using IT (PCs, etc) compared with baseline
  - Percentage of economic operators stating that they have obtained savings or other benefits by using the e-Procurement system
  - Submission of tenders by SMEs, contracts won by SMEs
- System performance
  - Number of complaints and clarifications related to the use of the e-Procurement system
  - Percentage of system availability to users (contracting agency and bidder)
  - Number of user help desk requests (contracting agency and bidder)

The measurement process can be incorporated into the e-Procurement System, which should enable automated monitoring of KPIs for stakeholders. The PMIS capabilities and M&E systems would also provide major operational benefits by providing improved capabilities to monitor suppliers, buyers, prices, aggregations in buying and the prospects for framework contracts where appropriate.

The services provided by the e-Procurement system should adhere to certain minimum service levels. For each KPI a benchmark needs to be decided upon and a review strategy developed as a part of the implementation strategy such as in the Table.

The achievement against the targets should be reported to the PSC.

### KPI Action Planning

Key Performance Indicators - Examples	Base line	Evaluation Criteria
<ul style="list-style-type: none"> <li>Percentage of notices publicized electronically compared with baseline (number &amp; value) – after 6, 12 months</li> </ul>	<p>6 months pilot</p> <p>By Agency:</p> <p>Ratio of Total no. of Electronic tenders to Total number of Tenders in Pilot entities by the end of Pilot phase</p> <p>12 months roll out Ratio of Total number of Electronic tenders to Total number of Tenders in Pilot entities by the end of Pilot phase</p>	<p>If ratio is less than 50% then strategy has to be changed.</p> <p>If ratio is less than 50% then strategy has to be changed.</p>
<ul style="list-style-type: none"> <li>Number of economic operators registered (number &amp; value) – after 6, 12 months</li> </ul>	<ul style="list-style-type: none"> <li>6 month: 500 bidders</li> <li>12 months: 3000 bidders</li> </ul>	<p>If ratio is less than 50% then strategy has to be changed.</p>
<ul style="list-style-type: none"> <li>Savings through e-Procurement based competition</li> </ul>	<p>Percentage of saving against estimated cost</p>	<p>Target 3-5% saving</p>
<ul style="list-style-type: none"> <li>Percentage of economic operators satisfied with the procurement process compared with baseline</li> </ul>	<p>Both for procuring entities and bidders</p> <ul style="list-style-type: none"> <li>Bidding Process</li> <li>Efficiency improvement</li> </ul>	<p>Positive vs. Negative response</p> <p>Positive response should be at least 75%</p>
<ul style="list-style-type: none"> <li>Number of complaints related to the use of the e-Procurement system</li> </ul>	<p>Ration of number of complaints against number of tenders</p> <p>Should not be more than 5%</p>	<p>Need to review</p>
<ul style="list-style-type: none"> <li>Time saving from RFT to notice of award (NOA)</li> </ul>	<p>RFT to NOA</p>	<p>Reduced by 50%</p>
<ul style="list-style-type: none"> <li>Contract award results published online</li> </ul>	<p>Percentage of contract awards against total e-Tenders</p>	<p>Target 100%</p>
<ul style="list-style-type: none"> <li>Supplier training</li> </ul>	<p>Number of economic operators addressed in road-shows, materials circulated, etc.</p> <p>Number of economic operators registered</p>	
<ul style="list-style-type: none"> <li>System reliability</li> </ul>	<p>System down time vs 100%</p>	<p>Down time should be less than 0.1%</p>
<ul style="list-style-type: none"> <li>Skills development</li> </ul>	<p>Redundancy in systems administration capacity</p>	<p>Target 100%</p>







