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INDIA: Case study on e-Government Procurement Development (Financed by R-CDTA 7437: Asia Pacific Procurement Partnership Initiative)

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For Asian Development Bank

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1 Executive Summary

This case study has been prepared with the intent to provide a rich and holistic view on the development of e-GP in India. An attempt has been made to consolidate various details about implementation of e-GP in India. All factual data presented in this document is backed up by publicly available information from reliable information sources. e-GP policy makers and government policy makers would find this document relevant.

Government procurement in India is decentralized. At the high level, government organization is subdivided into 28 State Governments, 7 Union Territories, 51 Central Government Ministries and 247 Central Public Sector Enterprises. The Country Procurement Assessment Report of the World Bank estimates the value of public procurement at about 13% of the National budgets.

There is not a central legal framework governing public procurement in India. The State Governments of Karnataka and Tamil nadu have enacted State specific Transparency in public procurement Act. Otherwise, public procurement is governed by a set of Executive Directives. The procedural framework in place to govern and administer public procurement is similar to that of the World Bank guidelines, UNICTRAL model Law or other goods practices in public procurement. The frameworks of rules, procedures, codes, manuals and documents in place are designed to address the key basic guiding principles of public procurement: Transparency, economy, efficiency, effectiveness, fairness and competition amongst prospective suppliers.

This case study aims to shed light on e-GP systems implemented in India and also explain overall readiness of the eco-system required to enable implementation of e-GP systems. A set of 5 established e-GP implementations are explained in detail to provide rich insights on various aspects of implementation.

Given the success stories after a decade long e-GP implementation experiences, the need for implementing e-GP systems is not questioned any more. There is general agreement amongst all stakeholders that e-GP is a necessary innovation. Details of the key initiatives taken so far to build a framework for e-GP implementation across India are provided in this case study.

The various stakeholders involved in e-GP implementation are identified and their involvement in e-GP implementation is explained. Conceptual design and current implementation status of various e-GP initiatives are relied upon to:

- Identify various e-Governance systems with which e-GP systems may have to be integrated
- Define the integration requirements at high level
- Identify possible areas of overlap in functionality (i.e.) functionality regarded as in the scope of e-GP is implemented under a different e-Governance system
- Explain readiness of the enabling infrastructure

The functional scope of e-GP system referred to in India by e-GP policy makers, Application Service Providers and in e-GP implementations is similar to that of the definition provided in the Multilateral Development Banks e-GP (MDB e-GP) web site. Though there is wide spread acknowledgement of the end-to-end scope addressed by e-GP software, not all functional aspects of government procurement is handled electronically in existing e-GP implementations in India. Even matured e-GP implementations such as that in the State Government of Andhra Pradesh, Indian Railways and State Government of

Karnataka do not have the fully integrated end to end e-GP system implemented and fully operational. The center piece of e-GP implementation is e-Tendering module, which has vendor management and auction modules as bolt-on components.

Key aspects of e-GP technical architecture are discussed under:

- Architecting a unified e-GP platform
- Need for extensible, scalable and reliable system
- Implementation of unified item code classification
- E-GP inter-operability requirements for National e-GP

Since procurement in India is de-centralized, the emergence of multiple e-GP systems is inevitable. The implementation of unified e-GP systems will reduce the number of installations, but still multiple e-GP systems will exist. These many e-GP systems should be made inter-operable to develop a National e-GP system in effect. Three areas of inter-operability have been identified viz.:

- National repository of tenders
- National database of registered suppliers
- National database on suppliers performance

The cost items involved in implementation of e-GP system are classified under: i) Set-up costs ii) Marginal cost and iii) Maintenance expense. The set-up costs and maintenance expenses are shared across larger number of users in case of unified e-GP systems. And also, the cost of bringing in an additional user department within a unified e-GP platform is only marginal. Considering which, implementation of unified e-GP systems should be encouraged.

The approach adopted for implementation of e-GP system has evolved with time. The concept of e-GP was new about a decade ago. Then, IT savvy resources in individual Government departments initiated the implementation of e-Tendering system in their respective departments. Such implementations were done using Commercial Off the Shelf (COTS) software developed specifically to address government tendering requirements. The adoption of department specific e-Tendering systems gradually increased as the concept got popularized. In this background, few Government agencies initiated implementation of unified e-GP systems. Such implementations are governed by a Steering committee chaired by Chief Secretary level officers with Principal Secretary and Secretary level Government officers as its members. The initiative to operationalize e-GP MMP under the National e-Governance Program (NeGP) happened in the backdrop of institution driven unified e-GP system implementations and continued adoption of e-GP systems in individual departments. The Ministry of Commerce & Industry (Department of Commerce) got identified as the line department for implementation of e-GP MMP in 2007.

Details about the following 5 key e-GP implementation experiences are provided:

- a) State Government of Andhra Pradesh
- b) Indian Railways
- c) State Government of Karnataka
- d) State Government of Chhattisgarh
- e) Government e-Procurement System of NIC

The understanding of e-GP security implementation requirements has evolved based on about 10 years of e-GP implementation experiences in India. The STQC Directorate in DIT has prepared comprehensive and detailed guidelines for compliance to Quality and Security Requirements of e-Procurement system.

Stakeholders will find an e-GP system complying with the security guidelines prescribed by STQC as "...secure, transparent, auditable & compliant with government procurement procedures".

e-GP Implementation challenges are discussed under two sections namely:

- Decision to adopt (join or not join) a unified e-GP system
- Change management

Government departments implementing e-GP system have reported the following key benefits:

- Average number of bidders per tender has increased
- Tender premium has decreased by about 15%
- The cycle time taken to evaluate tenders has decreased

Key lessons from e-GP implementation experiences and suggestions for the way forward are provided. The need for concept clarity on National e-GP architecture is highlighted viz.:

- What should be the unit of e-GP implementation (e.g.) can it be decided that there should be only one instance of e-GP software in a State Government / UT. In other words, how large is large enough
- How many e-GP installations are required to address government procurement requirements of State Governments, Central Government Ministries and PSUs
- What is the Vision for National e-GP MMP (i.e.) at what point can it be said that the objectives set forth for e-GP MMP has been achieved?

2 Government Procurement in India

2.1 Procurement Expenditure Details

Government is a key consumer of wide range of goods, works and services produced in the economy. Through its procurement activities, Government could actively contribute towards development and sustenance of industry. A significant percentage of the expenses incurred by Government is spent on procurement activities. Depending on the nature of work undertaken by procurement entity, the % of the entity's budget spent on procurement activities tends to vary. Departments like Railways, Defense and Telecom spend about 50% of their budget on procurement and about 26% of health budget is allocated for procurement¹. The Country Procurement Assessment Report (CPAR 2003) of the World Bank estimates the value of public procurement at about 13% of the National budgets. The share of procurement expenditure in the budgeted expenditure will be higher in case of State Government when compared with the Union government since State Governments spend less towards loans and grants to lower tiers of Government²

As per a study conducted by the Organization for Economic Cooperation and Development (OECD), total procurement for all levels of Government accounts for about 20% of GDP for OECD countries³. In India, the CPAR by the World Bank reports the value of public procurement as over 20% of GDP. The plan expenditure (i.e. both revenue and capital expenditure) by all the States in the year 2009 amounts to 5.79% of GDP⁴. The GDP of India in 2009 is set at 1.377 Trillion USD⁵ and growing at the rate of about 8%⁶. In terms of value, the annual procurement spend by Government in 2009 will be in excess of 275 Billion USD.

2.2 **Procurement Organization**

Government procurement in India is decentralized. The Directorate General of Supplies & Disposals (DGS&D)⁷, a central purchase and quality assurance organization formed in the year 1860, is now primarily focused on concluding rate contracts (frame agreements) for a large number of items. Procurement entities in India can choose to procure items from the list of suppliers empanelled by DGS&D as per the empanelment terms and conditions. At the high level, government organization is sub-divided into 28 State Governments, 7 Union Territories, 51 Central Government Ministries and 247 Central Public Sector Enterprises.

A State Government / Union Territory typically has about 40 line departments addressing subject areas such as power, irrigation, public works and rural development. Refer to Annexure A for detailed list of line departments in one of the State Governments in India (i.e. State Government of Tamil nadu).

Line departments such as the Public Works Department (PWD), Energy and Municipal Administration are procurement intensive departments and departments such as Personnel and Administrative Reform

¹ "Enhancing Value in Public Procurement", special address by Shri. Pratyush Sinha, CVC

² Srivatsava V. (1999), "India's accession to the GPA: Identifying the Costs and Benefits", NCAER, New Delhi

³ http://www.oecd.org/dataoecd/34/14/1845927.pdf

⁴ http://planningcommission.nic.in/data/datatable/index.php?data=datatab

⁵ http://data.worldbank.org/indicator/NY.GDP.MKTP.CD

⁶ <u>http://www.cii.in/Economy.aspx?enc=LqAXY5bXIsb2PzUHQxy2iQ</u>==

⁷ <u>http://www.dgsnd.gov.in/about.htm</u>

and Finance are policy and administration oriented and hence do not procure as much. The procurement intensive departments are typically into infrastructure development activities (e.g. road development, canal engineering and power transmission) and their activities can get funded from multiple sources such as:

- Budget allocation by State Government
- Specialized development schemes designed by the Central Government (e.g.) National Highways and the NABARD (National Bank for Agriculture and Rural Development) scheme
- Loan assistance provided Multilateral development agencies such as the World Bank and the Asian Development Bank
- Revenue earned from delivery of services such as that of power distribution, public transportation, water supply and toll collection

Large sized line departments have multiple institutions underneath them, each focused on specialized set of activities. For example, Water Resources Department in the State of Karnataka has underneath it the following 3 institutions:

- a. Karnataka Neeravari Nigam Limited (KNNL), a fully owned Government of Karnataka Company formed to harness the waters of the Upper Krishna River
- b. Cauvery Neeravari Nigam Limited (CNNL), a Government of Karnataka undertaking formed for completion of all ongoing works and Modernization of completed projects in Cauvery basin
- c. Krishna Bhagya Jala Nigam Limited (KBJNL) , a fully owned Government of Karnataka Undertaking incorporated for implementation of the Upper Krishna Project

The 3 major corporations listed above have been incorporated as Special Purpose Vehicle (SPV) for speedy implementation of irrigation projects and also to enable Government to borrow from external sources⁸. Besides the irrigation work undertaken by the 3 corporations, the Water Resources Line department undertakes some projects directly. Each institution under a line department has its own organization set-up and delegation of financial powers and does procurement on its own. The line department typically provides the required administrative sanction for procurement (i.e. as per the annual action plan submitted) and also does reporting on the projects undertaken by institutions underneath it. A State Government / Union territory would typically have 100+ procurement entities, engaged in procurement of goods, works and services.

A procurement heavy entity typically has a pyramid type organization chart, wherein a Secretary level officer heads the entity at top of the Chart as the administrative head. This administrative head in turn reports to a Ministerial (i.e. under the political arm of the Government) officer assigned. The number of resources employed in an entity is proportional to the scope of work undertaken by the entity. The larger the number of resources employed in entity, the more hierarchical (i.e. layered) the administrative establishment tends to get. The number of offices in an entity and wherein they are located is also linked with the scope of work undertaken. For example, an entity assigned the responsibility of city administration will have its offices within the city limits. Alternatively, an entity assigned to manage State Highway (Roads and Bridges) will have offices located across the State. The organization hierarchy of entities engaged in works procurement is typically as given below⁹:

⁸ Refer Karnataka Water Resources Department web site: <u>http://waterresources.kar.nic.in/introduction.htm</u>

⁹ Refer the Water Resources Department, State Government of Bihar as sample at: <u>http://wrd.bih.nic.in/</u>



Figure 1: Typical Organization Hierarchy of Entity Involved in Works Procurement

The number of resources employed in each level below the Engineer in Chief (CE) increases in Geometrical Progression (GP). For example, a CE will have two of more Superintending Engineers (SE) reporting to him and each SE in turn will have two or more Executive Engineers (EE) reporting to him and so on. Each resource type identified in the pyramid heads an office (e.g.) EE is the head of a Divisional Office and all operations of the entity in the Division are managed by the concerned EE. A team of resources will be employed in each office to support the head of the office. The offices located higher up the hierarchy will have larger number of resources employed to support the head of the office, since the number of projects monitored / managed gets culminated higher up the hierarchy. The CE's office will have a large team to review, approve and manage the works undertaken across the State. Inter-office communications are typically done from the head of one office to the head of another office (e.g.) EE of a Division will send communication to SE of the Circle under which the Division falls under. The head of an office will delegate the work to his team members using intra office communications.

The Department of Irrigation in the State Government of Punjab has about 12 Chief Engineer offices, 31 Circles and 95 Divisional offices¹⁰. Including sub-divisional offices, the Department of Irrigation will have 250+ offices. Government procurement, when looked at as an end to end function involving estimation, tendering and contract management, is undertaken across multiple offices of a procurement entity. In the Irrigation department example given above, resources employed in the 250+ offices will partake in procurement activities in one form or the other. These offices will be spread across the State and bulk of the offices will be located in and around areas where rivers flow and irrigation work happens. A large city corporation such as the Corporation of Chennai has 160 Divisional offices spread out is dependent on the work agenda specified for the department / entity. Since State Government has multiple line

¹⁰ Refer the menu titled "Organization" in the site: <u>http://pbirrigation.gov.in/disclaimer.html</u>

¹¹ Chennai City Corporation Organization Chart in the site: <u>http://www.chennaicorporation.gov.in/about-chennai-</u> <u>corporation/organizationChart.htm</u>

departments focused on different work areas, procurement activity happens from all geographical parts of the State. Each State will have 1000's of Government offices where procurement activities will be undertaken.

Procurement Organization in India



Figure 2: Procurement Organization in India

Central Government Ministries are involved in policy making in their respective work areas and also implement programs of the Union Government. Just as it is with State Government, Ministry has multiple entities reporting to it. Take for example the Ministry of Environment Forests¹², it has:

- 4 sub-ordinate offices
- 7 autonomous bodies
- 8 Divisions / Units / Wings / Branches
- 3 Statutory bodies
- 11 other entities

The 33 entities under the MoEF are focused on a specific area of work and they will have offices spread across India as per their area of work. The Central Pollution Control Board (CPCB) – a Statutory Body under MoEF) for example has 6 zonal offices spread across India in Bengaluru, Bhopal, Lucknow, Kolkata, Shillong and Vadodara¹³. Periyar Tiger Reserve, a division / unit under the MoEF has it office in the State

¹² Refer:

http://india.gov.in/min_dep.php?minid=07&minname=Ministry%20of%20Environment%20and%20Forests

¹³ Central Pollution Control Board (CPCB) web site: <u>http://india.gov.in/outerwin.php?id=http://cpcb.nic.in/</u>

of Kerala in and around the Reserve. Just as it is with the institutions reporting to a line department in State Government, each of the autonomous bodies / statutory bodies / units will engage in procurement activities on its own. Each entity will have its specific organization structure, approval workflows and financial delegation of powers. Procurement activity under the Ministries will be geographically spread out all across India. Ministries engaged in infrastructure development such as the Ministry of Urban Development will have institutions underneath it specialized in procurement of works,

The 247 Central Public Sector Enterprises (CPSE's) operate under the Ministry of Heavy Industries and Public Enterprises. A CPSE is governed by a Board of Directors, who is delegated powers subject to broad policy guidelines issued by Government from time to time. The Government has provided CPSE's with greater autonomy in their functioning, especially if they are profit making¹⁴. The CPSE's have registered offices across multiple States spread across India. A few of the CPSE's are very large sized entities with offices in all parts of India (e.g.) Bharat Sanchar Nigam Limited (BSNL) is World's 7th largest Telecommunications company with the best telecom network in India including a very strong presence in nook and corner of the Country. BSNL employs more than 2.5 Lakh (a quarter of a million) personnel¹⁵. A couple of more CPSE's are listed below as example:

- Power Grid Transmission of India¹⁶
 - <u>Mission:</u> Establish and operate regional and National power grid to facilitate transfer of electricity within and across regions
 - Turnover in excess of 7500 Crores (i.e.) in excess of 1.5 Billion USD in the Financial year 2009-10
 - Bharat Heavy Electricals Limited¹⁷
 - $\circ\,$ Largest engineering and manufacturing enterprise in India in the energy-related / infrastructure sector
 - Has employed 46,748 resources

Being autonomous bodies, CPSE's will define procurement organization as it suits their activities the best. The procurement of goods, works and services are undertaken as per standard tendering and procurement processes adopted by Government entities

2.3 Procurement Process Overview

Government procurement process can be conceptually sub-divided into pre-tendering, tendering and post-tendering activities. Depending on where in the hierarchy a resource is employed, the level of involvement of the resource in the various procurement activities tends to vary. A tabulated view of resource categories along with their level of involvement in procurement activities in given in this section:

¹⁴ Annual Report 2009-10, Ministry of Heavy Industries and Public Enterprises

¹⁵ Refer site: <u>http://www.bsnl.co.in/</u>

¹⁶ Refer site: <u>http://www.powergridindia.com/PGCIL_NEW/home.aspx</u>

¹⁷ Refer site: <u>http://www.bhel.com/about.php</u>

6 10	Activity	Level of Involvement of Resources in a Typical Works Procurement Entity							
5.no.		Minister	Secretary	CE	SE	EE	AEE	Supplier	
Pre-Te	ndering								
1	Grant Approval	High	High	Medium	Very Low	Very Low	Very Low	NA	
2	Admin Sanction	Medium	High	High	Medium	Low	Low	NA	
3	Technical Sanction	Very Low	Low	Medium	Medium	Medium	High	NA	
Tendering									
4	Tender approval	Very Low	Very Low	Medium	Medium	High	Medium	NA	
5	Bid submission	Very Low	Very Low	Low	Low	Medium	Medium	High	
6	Bid Evaluation	Very Low	Very Low	Medium	Medium	High	Medium	Medium	
7	Award of contract	Very Low	Very Low	Medium	Medium	High	Medium	Medium	
Contract Management & Execution of Work (Post Tendering)									
8	Bill submission	Very Low	Very Low	Low	Low	Medium	Medium	High	
9	Measurement & Monitoring	Very Low	Very Low	Low	Low	Medium	High	Medium	
10	Invoice processing	Very Low	Very Low	Low	Low	High	Medium	Medium	
Notes									
a)	"High" refers to ac	tive involven	nent of a reso	urce type, v	wherein the	resource un	dertakes the	work	
b) The level of involvement is set at "Medium" when a resource reviews and approves the				oves the wo	rk				
c)	"Low" involvemen	it refers to ca	ses where a r	esource ma	y get involve	ed in the act	ivity.		
d)	Level of involveme	ent is set at "\	Very Low" wh	en the prob	ability of a r	resource get	ting involved	d in the	
	activity is very low	,	•	•		0	-		

e) Tendering activities can be centralized in some procurement entities, wherein the level of involvement of CE and SE in tendering activities would be high

Figure 3: Procurement process overview

Works procurement begins with preparation of abstract estimate by the concerned field engineer, which is routed through the hierarchy for administrative sanction at first. Then, for those admin sanctioned works, the concerned field engineers prepare detailed work estimate as per approved schedule of rates (SoR). This detailed work estimate is sent for technical sanction. The administrative and technical sanction limits is defined in the financial delegation of powers specific to the procurement entity. Tendering activities in works procurement is mostly de-centralized (i.e.) Tender Inviting Authority (TIA) and Tender Acceptance Authority (TAA) is the concerned field engineer. When de-centralized, field engineer evaluates the proposals submitted by bidders and sends the evaluation details to officials higher up the hierarchy for approval. The delegation of powers for approval of tender evaluation details is typically defined in terms of the value of tender and as per % of deviation of the final tender price from the originally estimated contract value. The execution of work is managed by field officials by default and approvals are sought from officials higher up the hierarchy only in exceptional cases. Typically variation in quantities or prices beyond a certain percentage of the tender value is sent for approval up the hierarchy as per financial delegation of powers specific to the procurement entity.

The end to end procurement is a workflow driven. The 10 activities listed in the Table above would involve file movement across Government offices.

Goods procurement tends to be centralized except for indent generation and delivery acknowledgement, which is collated from the intended recipient of the goods. The Health and Family Welfare Department typically procures WHO model list of essential drugs. For example, the Tamil Nadu

Medical Services Corporation Limited (TNMSC)¹⁸ procures and maintains in its stock 268 items of drugs and medicines, 113 sutures and 57 surgicals. These medicines, sutures and surgical are served to all (32) District hospitals, (201) Taluka hospitals, primary health centers and health sub-centers among other institutions in the State. The indenting for items required and delivery acknowledgement is typically consolidated from the various locations wherein the medicines are consumed. The procurement of medicines however is done centrally by the TNMSC through an open tender system.

Procurement of services tends to be a centralized activity. The preparation and approval of Request for Proposal (RFP), bid process management and contract management tends to happen at the Head Quarters of procurement entity.

2.4 Procurement Related Legislation

There is not a central legal framework governing public procurement in India. The State Governments of Karnataka and Tamil nadu have enacted State specific Transparency in public procurement Act. Otherwise, public procurement is governed by a set of Executive Directives. The procedural framework in place to govern and administer public procurement is similar to that of the World Bank guidelines, UNICTRAL model Law or other goods practices in public procurement¹⁹. The frameworks of rules, procedures, codes, manuals and documents in place are designed to address the key basic guiding principles of public procurement: Transparency, economy, efficiency, effectiveness, fairness and competition amongst prospective suppliers. The rules and guidelines defined to govern public procurement are applicable to all Government departments and various autonomous bodies directly or indirectly reporting to it. Karnataka Transparency in Public Procurement (KTPP) Act is a State Act and therein procurement entity is broadly defined as follows: *"any Government Department, a State Government Undertaking, Local Authority or Board, Body or Corporation established by or under any law and owned or controlled by the Government, and any other body or authority owned or controlled by the Government and as may be specified by it."*

There is a constant and continuous effort by various arms of the Government to revise and update the various documents governing public procurement with the intent of keeping them up to date (e.g.):

- The Ministry of Finance has newly prepared and published in 2006:
 - A detailed Manual on policies and procedures for purchase of goods
 - A detailed Manual on policies and procedures for purchase of works
- The Haryana PWD code was revised to incorporate the latest developments in construction know-how, practices and control systems and also include the enlarged scope of operations of the departments and sea change in the methods of management²⁰ and
- A draft of the Kerala PWD manual is now ready and published in the department's web site seeking comments²¹

Both Central and State Governments derive their authority to undertake procurement from the Constitution of India as explained below:

¹⁸ <u>http://www.tnhealth.org/tnmscpro.htm</u>

¹⁹ "Collusion and corruption in public procurement, Contribution from India, Unclassified OECD paper

²⁰ <u>http://haryanapwd.nic.in/PWD%20CODE%20Final.pdf</u>

²¹ www.keralapwd.gov.in

The Article 53 in the Constitution of India vests Executive power of the Union with the President of India, who is authorized to exercise the right directly or through sub-ordinate officers. As per the powers conferred on the President of India vide Article 77 of the Constitution of India, the business of Government is allocated amongst the many Ministries, Departments, Secretariats and Offices and the subjects distributed among the departments, as per the Government of India Allocation of Business Rules and Transaction of Business Rules. The clause 4(2) of Transaction of Business Rules vests the power to sanction expenditure with the Finance Ministry. All Financial transactions are governed by provisions and broad guidelines set forth in the General Financial Rules (GFR) 2005. The broad guidelines for Works, Goods and Services procurement and contract management are laid down in Chapters 5 and 6 and 8 of GFR. The financial powers of Government are delegated to subordinate authorities as per the Delegation of Financial Power Rules (1978).

The manner in which State Government derive the authority to undertake procurement from the Constitution of India mirrors that of the Central Government. The Article 166 in the Constitution of India vests the authority for Executive Action of a State Government with the Governor of the State. The Governor of State is empowered to define the allocation of business & transaction of business rules. State Departments are required to obtain the required sanctions a priori from the Finance Department of the State for incurring expenditure. The Finance Department of State such as in the Gujarat, Himachal Pradesh and Orissa has formulated State specific General Financial Rules in line with the GFR formulated by the Ministry of Finance. State Governments have their own specific set of rules for delegation of financial powers to various subordinate departments. The powers delegated to departments are further delegated vide the department specific code / manual. The manuals are defined such that when there is a conflict between applicable laws (e.g. financial rules, accounting code and budget manual) and rules of the Government and the code, the former shall prevail.

The Comptroller and Auditor General of India (CAG) constituted as under Article 148 of the Constitution undertakes ex-post audit of government procurement activities. The audit undertaken by CAG seeks to examine whether transactions resulting in expenditure were undertaken as per applicable laws, rules, regulations and delegation of financial powers. Also, CAG does performance audit and does an independent assessment of the extent to which an organization functions economically, efficiently and effectively. As per Article 151 of the Constitution, CAG submits audit reports pertaining to accounts of the Union to the President of India and the reports pertaining to accounts of the States to the concerned Governor of the State. The President and Governor submit the CAG reports to the House of Parliament and Legislature of the State respectively where the reports are discussed. The functioning of the Executive body in the State is governed by the Standing Committees and other committees such as the Committee on Estimates, the Committee on Public Accounts and the Committee on Public Undertakings and Departmentally Related Standing Committees (DRSCs). The various committees act as the parliament's "watch-dogs" over the Executive²². Though there is not a designated nodal agency specifically to monitor adherence to the laid down public procurement related rules and regulations, CAG does audit procurement related transactions and results of the audit are brought to the notice of the legislature and as per the feedback certain remedial actions are taken. Thus, the system has certain in-built checks and balances.

Besides, aggrieved parties have the option to contest irregularities if any with procurement related transactions in the court of Law. Also, the Judiciary also allows a person who is not directly involved in procurement to file a Public Interest Litigation (PIL) against the State or Central Government entities

²² <u>http://www.parliamentofindia.nic.in/ls/intro/p21.htm</u>

seeking justice. Few State Governments such as Karnataka, Uttar Pradesh and Haryana have set-up Lokayukta (Ombudsman appointed by the State). Aggrieved parties have the option to submit their grievances and seek investigation of the said transactions for irregularities reported. The Government has constituted Central Vigilance Commission (CVC) as an apex vigilance institution to inquire into the offences allegedly committed under the Prevention of Corruption Act (1988) by certain categories of public servants of the Central Government. CVC derives its powers from the Central Vigilance Commission Act enacted by the Parliament in 2003.

The Right to Information (RTI) Act (2005) has been enacted to promote accountability and transparency in the working of government. As per provisions of this Act, citizens of India have the right to seek information (as per definitions given in the Act) about the functioning of government. The provisions of this Act can be used by citizens to seek information about procurement related transactions.

The Information Technology Act (2000) has been enacted to provide legal recognition for transactions done electronically. Provisions in Chapter IV of the Act enable the Central Government to appoint a Controller of Certifying Authority (CCA), who in turn will operationalize the system required for generation and issuance of Digital Signature Certificates (DSC). An electronic document digitally signed using a valid DSC – issued by a Certification Authority (CA) empanelled by the CCA – has legal validity and it can be presented in the court of law as evidence. Since procurement is a commerce activity, implementation of e-Government Procurement (e-GP) necessarily requires a system for creation of valid DSC's and also to recognize digitally signed documents as legally valid.

2.5 Relevance of Procurement Specific Legislation for e-GP Implementation

A procurement specific legislation prescribes a set of conditions as per which procurement activities shall be conducted by the various agencies falling under purview of the legislation. The Act is accompanied by a set of rules, which provide detailed clarification on interpretation of the Act. These rules are applied in a standardized manner by all the departments. A unified e-GP system has to be designed as per rules defined in the legislation and it has to be kept in sync with the legislation. The functional requirements for crux of e-GP software are pre-defined when there is a governing procurement law. For example, the Karnataka Transparency in Public Procurement (KTPP) Act has certain key processes well defined:

- Appellate Authority for a tender has to be identified upfront in a tender
- Various tendering options allowed (e.g. one envelope, two envelopes, three envelopes and Expression of Interest)
- Each tender shall have Tender Inviting Authority (TIA) and Tender Acceptance Authority (TAA)
- Rules for formation of Tender Scrutiny Committee (TSC)
- Negotiations shall be held only with the Lowest bidder
- List of details an award of contract should contain &
- Appeal procedure

The agency implementing unified e-GP system can look up to the legislation as a reference point when there are disagreements on implementation of a procurement process. Clarity emerging of such disagreements can be documented and published as a set of rules and these rules could then be taken as reference in future. Thus, a knowledge base on government procurement gets developed as a result of this process. The implementation of e-GP system per se could be mandated by an amendment to the

Act and modalities of e-GP implementation could then be made effective by development of e-Procurement specific rules (e.g.) subjects such as:

- Online tender opening
- Process to address technical glitches in e-GP system adversely impacting bid submission process
- Security implementation in e-GP
- Implementation of online appeal

The e-Procurement specific rules will act as an important reference when an aggrieved supplier to government approaches the court of law regarding procurement handled in e-GP system.

3 Research Methodology

Thousands of government agencies are engaged in procurement activities, since procurement in India is a decentralized activity. Refer to the sub-section titled "procurement organization", wherein this decentralization of procurement is explained in detail. The various government agencies are entitled to take the initiative on their own to implement e-GP system in their respective departments. Consequently, just as it is typical with the diffusion of innovations, few Government agencies have pioneered the adoption of e-GP sometime during early 2000. The "early adopters" have come in subsequently resulting in creation of a few more e-GP implementations. As on date, India would have in excess of 100 e-GP implementations across the Government. Newer agencies are getting onto the band-wagon. The use of e-Tendering system to handle procurement activities has now become somewhat de facto.

There is not a reference standard as per which e-GP implementations are done in India. Hence, the maturity level of e-GP system implementations tends to vary. The maturity of an e-GP implementation can be evaluated as per the Functional scope and Geographical scope covered in the implementation. "Functional scope" herein refers to the scope of activities handled electronically in e-GP implementation and "Geographical scope" refers to the scale and coverage of implementation. An implementation is marked as mature when end to end procurement activities (i.e. estimate preparation, tendering, contract management and supplier registration) are handled entirely electronically in a fully integrated software system & when a single instance of e-GP implementation is used as a shared infrastructure by a large number of procurement entities.

Implementation of e-GP system is not just a technology development project. Instead it involves implementation of Information Technology (IT) enabled change rooted in a social context. The ecosystem that has traditionally sustained government procurement will need to evolve and accept the use of e-GP for handling procurement activities. The checks and balances there are in the manual system have to be replicated or improved upon to show that implementation of e-GP does not adversely affect the key principles governing public procurement such as Transparency and Fairness. Since there is demand for large number of e-GP implementations, the supply side for development and deployment of e-GP systems has got created. The state of readiness of the market for e-GP systems has to be better understood.

This case study is focused on explaining the development of e-GP in India from a historical perspective. It aims to shed light on e-GP systems implemented in India and also explain overall readiness of the ecosystem required to enable implementation of e-GP systems. A set of 5 established e-GP implementations are explained in detail to provide rich insights on various aspects of implementation.

Given the success stories after a decade long e-GP implementation experiences, the need for implementing e-GP systems is not questioned any more. There is general agreement amongst all stakeholders that e-GP is a necessary innovation. As on date, e-GP implementations in India are driven locally from within procurement entity²³ and not as per some National framework for e-GP implementation. The key stakeholders are now engaged in a dialogue on the approach to be adopted to ensure speedy implementation of a matured e-GP system consistently across all government

²³ One could argue that State wide e-GP systems happen within a well defined framework and such implementations are not driven from within procurement entity. But the point being made here is that there should be State-wide e-GP system is not defined in any framework as of now.

procurement entities in India. Few attempts have already been made to build a framework to expedite e-GP system deployment, but they have not been very successful. Details of the key initiatives taken so far to build a framework for e-GP implementation across India are provided in this case study. This dialogue on the approach to be adopted to expedite e-GP implementation across India provides a 10,000 feet view. The insight this dialogue provides is very important because it deals with e-GP policy making and a policy on e-GP is a critical requirement for India where procurement is decentralized and undertaken by several hundred government departments.

This case study has been prepared based on publicly available & reliable secondary information sources (i.e.) web sites, rules, regulations, acts, codes, manuals, tender documents, reports, Government Orders, Notifications, presentations and newspaper articles.

4 Key Stakeholders and their Involvement in e-GP

The various stakeholders involved in e-GP implementation are identified and their involvement in e-GP is explained in this section.



Figure 4: Key e-Government Procurement Stakeholders

4.1 Procurement Entity

Government departments and the various autonomous bodies directly or indirectly reporting to the Government engaged in procurement activities are referred to as procurement entity. A detailed description of procurement entity as defined in the Karnataka Transparency in Public Procurement (KTPP) Act is specified in the sub-section titled "Procurement Related Legislation". Each procurement entity will have its own specific organization structure and one or more employees of a procurement entity will be authorized to undertake procurement activities as per the delegation of powers specific to the entity. The size of procurement entity can vary depending of the subjects and scope of work allocated. A large sized department can have thousands of resources employed in hundreds of government offices spread across a State or the Nation. On other side of the spectrum, a procurement entity could employ < 10 resources in one single office. Refer to the sub-section titled "Procurement Organization" wherein organization structure and workflow of a typical works procurement agency is explained in detail. The decision on whether to adopt e-GP system is taken by administrative head of procurement entity and any such decision taken by the administrative head is in general adhered to by various resources employed by the entity. The actual change and transitioning from the manual system to the use of electronic system to handle procurement activities is effected by the resources employed by a procurement entity. These resources will have to be trained in using e-GP system and it is important that they get convinced about benefits of e-GP.

4.2 Contractor / Supplier Community

Enabling contractors / suppliers to tender their proposals online is a key pre-requisite for successful implementation of e-GP. The implementation of unified e-GP platform enables centralized supplier registration, where one single database of contractors gets developed. The unified e-GP system implemented by the State Government of Karnataka has in excess of 9000 registered suppliers as on the year 2010²⁴. The country as a whole will have several hundreds of thousands of suppliers / contractors. Implementation of e-GP systems would require these contractors to get well versed with online bid submission process. Just as it is the case with resources employed in procurement entity, the transition from manual procurement to electronic procurement gets effected by the contractor community.

Traditionally, procurement entity is the focal point of interaction with suppliers. Government agencies such as Public Works Department register contractors on a periodic basis under multiple different classes (Class 1, Class 2 etc.) as per contractors' financial capabilities and past experiences. A Class 1 contractor is generally regarded as capable and well experienced. Government agencies tend to prefer a phased deployment approach for implementation of e-GP, wherein the most capable contractors are required to embark on online submission of bids. The threshold for adoption of e-GP system is typically set on the basis of procurement value (e.g. > 100,000 USD). With experience, this threshold is gradually lowered and thus adoption of e-GP amongst contractor community in a phased manner is enabled.

4.3 e-Procurement Application Service Providers (ASP)

The e-Procurement Application Service Providers (ASP) have so far played a critical role in catalyzing uptake of e-GP in India. The ASP's have developed e-GP software system in a fairly standardized manner and have offered the use of this software to various government agencies on a services / transaction based business model. As per the services business model, government agencies need not directly pay for the software. Instead, payment is made for transactions handled using the deployed software. A bid submitted by supplier online using e-GP system is typically taken as the measure of a transaction in e-GP systems. The tender document fees traditionally paid by suppliers to procure tender document is replaced by tender processing fees due to be paid by suppliers for using the e-GP platform. Thus, a self sustaining business model for implementation of e-GP systems has been evolved. Most e-GP implementations in India operate as per the transaction based model explained above. The e-GP software available with the ASP's is rich in functionality for e-Tendering and supplier registration components. Consequently, most e-GP implementations in India are e-Tendering systems.

4.4 National Informatics Center (NIC)

The National Informatics Center is a premier Science and Technology organization under the Department of Information Technology, Government of India. NIC actively promotes and implements Information and Communication Technology (ICT) based solution in Government. NIC has developed an e-GP solution in-house titled (GePNIC), which has been implemented initially in Government departments in the States of Tamilnadu and Orissa. Subsequently, this solution has been deployed in multiple States such as West Bengal, Haryana, and Uttar Pradesh. As on the 28th of February 2011, around 52080 tenders have been published successfully using the NIC's GePNIC solution²⁵. The Department of Information Technology, Government of NCT of Delhi has issued a circular in March 2011

²⁴ <u>http://www.stockholmchallenge.org/project/2010/unified-end-end-e-procurement-project-0</u>

²⁵ http://informatics.nic.in/archive/april2011.pdf

informing the various departments to provide the information required for implementation of e-Procurement

4.5 Ministry of Communications & Information Technology, Govt. of India

The Department of Information Technology (DIT), Ministry of Communications & Information Technology has played an active role in conceptualization of the National e-Governance Plan (NeGP) and also provides the technical assistance required for implementation of the various Mission Mode Projects identified under this program. This NeGP comprises of 27 Mission Mode Projects (MMP), subdivided into 9 Central MMP's, 11 State MMP's and 7 integrated MMP's, of which e-Procurement is identified as an integrated MMP. The implementation of NeGP program is governed by:

- Cabinet Committee on e-Governance under the Chairmanship of the Prime Minister
- National e-Governance Advisory Board headed by the Minister, Ministry of Communication & Information Technology, Government of India
- Apex Committee chaired by the Cabinet Secretary

The Apex Committee has the following members:

- Secretary, Finance
- Secretary, Expenditure
- Secretary, Planning Commission
- Secretary, DOPT;
- Addl. Secretary, Administrative Reforms & Public Grievances;
- Secretaries of Line Ministries and
- Secretary, IT as the Member Convener

In principle approval of the MMP's has been accorded and the MMP's are under various stages of development. Planning Commission and the Finance Ministry allocate the funds required for implementation of this program. Budget allocation of Rs. 32,488 Crores (approx. USD 7 Billion) has been done altogether, so far, for all the Central, State and Integrated MMP's²⁶. However, financial outlay for e-Procurement project is yet to be made. A line department / Ministry is identified as the owner for implementation of MMP and is authorized to take all decisions required for implementation of the MMP. The Department of Commerce is assigned the role of managing the implementation of e-Procurement MMP. Also, development of the following e-Governance related infrastructure components is managed by DIT: State Wide Area Network (SWAN) through-out a State/UT and State Data Center (SDC) wherein multiple software applications implemented in a State Government can be co-hosted. The SWAN addresses to some extent the connectivity required for accessing e-Procurement systems hosted in a central server. The e-Procurement software systems could be co-hosted with other applications in SDC, and this co-hosting would enable savings in renting data center space and procurement of shared infrastructure such as server side bandwidth connectivity, firewall and mailing systems.

Besides involved in development of e-Governance, DIT is required to handle policy matters pertaining to information technology, electronics and Internet. The other key divisions in DIT are as under:

- Electronics & IT industry
- Cyber Laws & Security

[&]quot;²⁶ Saaransh – A Compendium of Mission Mode Projects under NeGP

- HRD & Knowledge Management
- Infrastructure & Governance
- Research & Development

DIT has constituted an institutional mechanism to develop standards on e-Governance. This institution has developed the following guidelines relevant to e-GP:

- Guidelines for Information Security &
- Guidelines for Digital Signature

The following institutions engaged in e-GP related operations fall under the umbrella of the DIT:

- Standardization, Testing and Quality Certification (STQC): An attached office to the DIT
- National Informatics Center (NIC): An attached office to the DIT
- Controller of Certification Authority (CCA)

The role and relevance of the 3 agencies in e-GP implementation are explained in separate sub-sections.

4.6 Ministry of Commerce, Govt. of India

The Ministry of Commerce has been designated as the nodal agency for implementation of e-GP MMP. The Ministry has engaged the services of the National Institute for Smart Government (NISG), to provide the consultancy support required to operationalize the e-GP MMP. Four agencies were selected to pilot e-GP implementation under the MMP initiative:

- I. State Government of Himachal Pradesh
- II. State Government of Kerala
- III. State Government of Madhya Pradesh
- IV. Ministry of Health & Family Welfare

Only 2 of the 4 agencies selected agreed to pilot the e-GP implementation. NISG conducted process studies and has prepared detailed Request for Proposals (RFP) for selection of a vendor for implementation of e-Procurement in the following 2 States: Kerala and Himachal Pradesh. Defining characteristics of the e-GP system envisaged by the NISG are as follows:

- Unified e-Procurement platform to be shared as a shared infrastructure by multiple Government agencies in the State
- e-GP system will be implemented in Private-Public-Partnership (PPP) mode

Of the 2 States selected to pilot this initiative, the State Government of Kerala published the RFP inviting proposals from interested bidders. In February 2011, the Department of Commerce has sanctioned a project at a cost of about Rs.900 million for helping state governments plug into the e-GP system of NIC (i.e. modified GePNIC) with appropriate training and hand holding features. It also has the option of allowing laggard departments of GOI to also plug into. A number of states and departments have also subscribed to it.

The Ministry of Commerce has several Autonomous Bodies, Advisory Bodies and Attached and Subordinate offices under its umbrella. The Directorate General of Supplies and Disposals (DGS&D) reports to the Ministry of Commerce as under "Attached and sub-ordinate" office.

4.7 DGS&D (National Procurement Agency)

Originally established as "India Stores Department" in London in 1860, DGS&D commenced operations in India in 1921 and established as "Central Procurement Organization" in 1951 under the Ministry of Commerce & Industry, Government of India. Post de-centralization in 1992, the main role of DGS&D is that of concluding rate contracts. Conceptually divided into 15 Directorates, DGS&D concludes annual rate contract (frame agreements) for 20,000 items under 350 product categories. DGS&D employs technical resources in multiple disciplines and expert professionals in public procurement. Headquartered in Delhi, DGS&D has 3 Regional offices in Metropolitan cities and 27 Quality assurance offices in industrialized towns across India. DGS&D is designated as the nodal agency for formulation of procurement policies and procedures by the Government of India. Also, as a specialized purchase agency under the Ministry of Commerce, DGS&D has been assigned a key role in implementation of the e-GP MMP²⁷.

DGS&D has implemented e-Tendering in 2002-2003 to handle the process for concluding rate contracts. Subsequently, DGS&D developed an end to end e-GP platform, wherein the e-Tendering component was implemented in PPP mode and the remaining components were developed by the NIC. The agreement with the ASP for provision of the e-Tendering component has expired since 2010 and a new ASP is yet to be selected.

In an apparent effort to expedite implementation of e-GP in India, DGS&D offered to provide its server system as a shared infrastructure to other Central Government Ministries and State Government departments. Thus, a National e-GP system was envisaged and it was decided that Government agencies adopting the National e-GP system will be incentivized with financial support. A few State Governments such as the Government of Delhi, Goa and Madhya Pradesh expressed interest in joining the National portal. However, many others did not agree since they had developed their own e-Procurement systems. The effort to select an e-GP ASP to run the National e-GP system however did not sail through. There was a protracted litigation with regards to that tender²⁸.

Subsequently, DGS&D has taken the initiative to empanel e-GP Application Service Providers (ASP) in 2010. As per the empanelment, ASP's will be required to deliver e-Procurement as a service. Just as it is with the rate contracts / frame agreements, any interested State or Central government agency can choose to procure the services of any of the empanelled ASP's as per the empanelment terms and conditions. There is no confirmation as yet on the status of this empanelment.

4.8 National Institute for Smart Governance (NISG)

NISG is formed as a not for profit company registered under Section 25 of the Companies Act. The setting up of NISG was jointly pursued by the Department of Information Technology and the Department of Administrative Reforms (DAR&PG), as per recommendation no. 97 of the National Taskforce on Information Technology and Software Development. NISG "... was planned to serve as an institutional mechanism for leading private sector competencies and resources including financial resources into e Governance projects in order to accelerate effective governance in an effective manner.²⁹" The service offerings of NISG are as follows:

• Strategic consulting

²⁷ Source: Presentation by Mr. Srivatsava, Director, DGS&D in eGovIndia 2008 conference

²⁸ Source: Saaransh, MIT web site

²⁹ Source: <u>http://www.nisg.org/home.php?page=aboutus.php</u>

- Project Consulting
- Capacity Building and Knowledge Management
- Research and Innovation

NISG provided strategic consultancy services to the State Governments of Karnataka and Chhattisgarh in conceptualizing the unified end to end e-Procurement system. The output of this engagement was a detailed Request for Proposal (RFP) and this engagement resulted in selection of an e-GP Application Service Provider (ASP) for each of the 2 States. e-GP in both the States is being implemented in Private Public Partnership (PPP) mode.

The Department of Commerce engaged NISG to provide consultancy support required to operationalize the e-GP MMP.

4.9 Central Vigilance Commission (CVC)

An introduction to CVC and its legal foundation is specified in the sub-section titled "Procurement Legislation". As the Apex Vigilance Institution in India, CVC has issued guidelines from time to time on the process to be adopted for procurement of works, goods and services. CVC has specifically issued a few guidelines on the use of web site and e-Tendering systems and these guidelines have become increasingly specific, detailed and technical. A few key guidelines issued by CVC are summarized below:

- a) One of the earliest guidelines was issued by CVC in 2003 (No. 98/ORD/1(Pt.IV)) required Government agencies to upload tender details in their respective web sites and provide the web-site information as part of the Notice Inviting Tenders (NIT) advertised in newspapers
- b) As per Office order 46/09/03, Government agencies "...may themselves decide on eprocurement/reverse auction for purchases or sales and work out the detailed procedure in this regard..." as long as "...the entire process is conducted in a transparent and fair manner."
- c) As per Office order 20/04/04 "The payment to all suppliers/vendors, refunds of various nature, and other payments which the organizations routinely make shall be made through electronic payment mechanism at all centres where such facilities are available in the banks."
- d) Vide circular dated 01/01/09, CVC has prescribed that "... all organizations should invariably follow a fair, transparent and open tendering procedure to select the application service provider for implementing their e-Tendering solutions"
- e) CVC has issued certain guidelines on security related issued in e-Tendering solutions vide Circular No. 29/09/09. A list of key points detailed in the circular are as follows:
 - a. Security considerations detailed as under:
 - i. Infrastructure layer
 - ii. Application layer
 - 1. Design
 - 2. Deployment
 - 3. Data storage and communication
 - b. Other good practices to address security considerations
 - i. Adoption of unified platform for all departments
 - ii. PKI implementation
 - iii. Audit by 3rd party agency at regular intervals
- f) Vide circular dated 18/04/10, a check list of security considerations to be adopted by government agencies while implementing e-Procurement solution is prescribed

4.10 Comptroller Auditor General of India (CAG)

The role of CAG in conducting ex-post audit of government procurement activities is explained in detail in the sub-section titled "Procurement Legislation". In the initial days of e-GP implementation, government agencies tend to keep record of their procurement activities both in manual form and in electronic form. With time, users tend to get accustomed with e-GP software and the tedious work of keeping record in manual form is gradually discontinued. Now that e-GP systems are PKI – enabled and in many cases with workflows built-in, procurement related file movements are handled entirely electronically. The approval of a file is accorded online by a designated Government official using his Digital Signature Certificate (DSC). The role and access based controls built within e-GP software verifies whether the designated official has the required financial powers to approve a specific file.

With the wide-spread adoption of e-GP systems, CAG needs to have the expertise and the systems in place to audit electronic transactions conducted online. Also, e-GP software should have certain functionality built-in to enable the audit (e.g.):

- Enable CAG staff to query the transaction database to identify one or more transactions for audit
- A mechanism to verify authenticity of digitally signed records (i.e.) verification of signed documents
- A mechanism to check and verify if delegation of financial powers assigned to various users in e-GP system is as per actual financial delegation of powers defined for the procurement entity

4.11 Standardization, Quality and Testing Certification (STQC)

An attached office to the Department of Information Technology, Government of India, STQC provides quality assurance services in the area of IT and electronics. Under the IT umbrella, STQC does software quality testing, information security and IT service management from its 6 Centers located across India. e-GP product vendors and government agencies implementing e-GP systems seek to have their solution / implementation STQC certified to highlight that their implementation in safe and secure. STQC would thus have had the opportunity to review multiple e-GP systems implemented in India.

STQC has been designated as the nodal agency for release of approved e-Governance standards and also version management of the standards. A draft of the Guidelines for Quality and Security Requirements for e-Procurement system is published recently and it is available in the MIT web site for comments till the 27th of May 2011.

4.12 Controller of Certification Authority & Certification Authorities

An introduction to CCA and CA is provided in the sub-section titled "Procurement Legislation". As on date, CCA has empanelled a total of seven CA's. Five out of the seven CA's issue DSC's to all interested parties. The remaining two CA's, IDRBT and NIC issue DSC to Banking and Government resources respectively. Since a DSC issued as per the IT Act of 2000 is valid all across India, an e-GP system should ideally accept the DSC regardless of the CA involved in issuance of the DSC. In other words, e-GP system should be able to read the "key" information, certificate stored from DSC's issued by multiple different CA's and multiple certificate chains leading up to the root certificate. Also, e-GP system should have the

features in-built to read Certificate Revocation List (CRL) from various CA's³⁰. An e-GP system owner would need to conduct these multiple inter-operability checks to ensure that the e-GP system works well with DSC issued by each of the empanelled CA's.

CA's have established robust supply chain across India to market DSC's to the contractor community. Since e-GP systems are fully PKI enabled, contractors participating in e-Procurement for the first time are required to purchase a valid DSC. The contractors get in touch with representatives from Certification Authorities to buy DSC and at the same also seek to clarify apprehensions that they may have on usage of e-GP system. Thus, the CA community acts as a key change agent and plays an important role in educating contractors about e-GP.

4.13 Donor Agencies

World Bank and other international funding agencies such as the IMF and ADB provide financial assistance for various developmental projects undertaken in the country. Procurement of works, goods and consultancy services financed by international funding agencies is done in accordance with procurement guidelines prescribed by the funding agency. Refer CVC guideline dated 1st October 1999, wherein it is clarified that "... the department/ organizations have no other alternative but to go by the criteria prescribed by the World Bank/concerned agencies and the Commission's instruction would not be applicable specifically to those projects.³¹"

There are few differences between the procurement guidelines by Indian Government agencies and that of the funding agencies. Hence, an e-GP system designed as per the guidelines issued by Indian Government agencies will not be found suitable to handle procurement activities of the funding agencies. An e-GP system has to be parameterized and aptly designed such that it complies with the various different procurement norms. It is now increasingly common for the funding agencies to adopt e-GP systems at least to handle the National Competitive Bidding (NCB) tenders. The e-GP system proposed for handling the tenders is typically evaluated by an expert team deployed by the concerned funding agency to certify whether the e-GP system complies with their procurement guidelines.

4.14 Citizens

Citizens often seek to know about the procurement activities undertaken by Government agencies. Consequent to enactment of the Right to Information Act 2005, citizens have the right to seek information under the control of public authorities. The RTI Act Section 4(2) states that *"It shall be a constant endeavour of every public authority to take steps … to provide as much information suo motu to the public at regular intervals through various means of communications, including internet, so that the public have minimum resort to the use of this Act to obtain information"*. Since e-GP software is inherently internet based, a view of the information stored in e-GP system can be made available to citizens with minimal effort. Further, rich features such as the Geographical Information System (GIS)

³⁰ CA's adopt different approach to make available CRL details. CRL could be made available on a real-time basis in a web site location. In which case, e-GP system should pick up the web site details and verify at the time of signing, that the certificate used for signing does not appear in the CRL. Another approach is to update the CRL on a periodic basis and make available the updated CRL in a web location. The e-GP system then picks up the updated CRL on a periodic basis and stores it within its Database and does the verification from the CRL stored in its database.

³¹ This particular guideline was issued pertaining to the subject: Post tender negotiations to projects...

could be implemented to project information in a user friendly manner. Citizens could then drill down and select the area where they reside in a map and learn about the status of development and maintenance activities undertaken by different public authorities.

5 e-GP Functional Architecture

The functional scope of e-GP system referred to in India by e-GP policy makers, Application Service Providers and in e-GP implementations is similar to that of the definition provided in the Multilateral Development Banks e-GP (MDB e-GP) web site³². An end-to-end e-GP system has the functionality inbuilt to handle the following key procurement processes in an integrated manner:

- a) Supplier / Contractor management
- b) Indenting & estimate preparation
- c) Tendering
- d) Auctions
- e) Contract & catalogue management



Figure 5: e-GP Functional Architecture

A brief overview of the software developed to handle the above listed processes is given below:

5.1 Supplier / Contractor Management

Suppliers keen to participate in the tenders published in e-Procurement platform need to get registered by submitting an online application form. Unlike the registration of suppliers under various categories such as Class-1, Class-2 etc., wherein the suppliers' financial and technical capabilities are verified, the registration in e-GP platform is a simple affair wherein only certain basic checks are done, such as:

- Verify if a supplier seeking registration in e-GP platform is a valid entity and
- Check to ensure that the same legal entity is not registered twice.

³² <u>http://www.mdbegp.org/www/</u>

Provided the validation is successful and the required documentation is in order, the supplier is registered and provided with a unique identity in the e-GP platform. All transactions performed by suppliers are automatically stored in e-GP software.

A supplier registered in a unified e-GP platform can respond to tenders published by multiple different departments in the platform using the same registration. The module is designed such that performance of suppliers as recorded in the Contract Management module is stored automatically and a view of the same is made available to all government users in e-GP platform. A supplier rating system can be put in place, wherein government users can grade a supplier regarding the supplier's performance in a contract awarded and managed in the e-GP platform. Suppliers can then refer to their experiences recorded in e-GP platform while responding to tenders as against uploading a scanned copy of their experience certificates. The veracity of experiences referred to by suppliers need not be doubted in which case. If recording of experiences could be made adequately objective, e-GP system can be designed to automate technical bid evaluation to some extent. But for all this to happen, activities post award of contract such as bill submission, Measurement Book (MB) verification, invoice processing, physical progress reporting, penalty deductions and overall grading of suppliers shall be done online in e-GP software.

5.2 Indenting & Estimate Preparation

Creation of an indent and preparation of an estimate is taken as the first activity performed by a Government user in e-GP software. Budgeting and preparing the plan of work will be done outside e-GP software, details of which could be fed it into e-GP software either manually or could be picked up automatically from the concerned software external to e-GP software. This module is workflow heavy and it is designed to handle inter-office and intra-office file movements across organizational hierarchy as per financial delegation of powers specific to the organization. A work estimate for which grant sanction has already happened will be sent for administrative sanction at first and then for technical sanction. A technically sanctioned work can be tendered.

Government users prepare work estimates based on approved Schedule of Rates (SoR) and rate analysis specific to the SoR. This SoR is work area specific, hence there are multiple SoR and each SoR is revised on a regular basis to keep the SoR relevant and up to date. The inputs (i.e. measurements) required for preparation of estimates is taken from the field and estimated cost is calculated for each work item. The base cost of a work item specified in SoR is taken and rate analysis (lead, left calculations etc.) duly applicable is calculated to derive the applicable cost. Thus, a work estimate is prepared. The officials higher up the hierarchy evaluate work estimates and rate analysis in detail to ascertain if final estimated price is arrived at as per departmental norms. Hence, details of work estimates shall be enclosed with the file sent for administrative and technical sanctions. The preparation of work estimates can be simplified with the use of specialized software³³. A good e-GP system will have the key features of work estimate preparation module, so Government users need not use different software for estimate preparation and estimate approval.

In case of goods procurement, an indent is created, aggregated and then approved. Each item procured is identified by a unique part number in e-GP software. An approved indent can be tendered.

³³ (e.g.) <u>http://www.estimator.in/</u>

A unified e-GP system should be robust and have the flexibility in-built within to handle different organization specific workflows and financial delegation of powers within a single instance of software.

5.3 Tendering

A critical component of e-GP software, e-Tendering module seamlessly integrates with the Indenting & Estimate Management module. A tender will be created as per approved indent or work estimate. The official authorized to invite tender will specify tender conditions (Notice Inviting Tender), obtain necessary approvals from up the hierarchy as per the NIT approval requirements specific to department and then publish tender. The tendering component should be adequately parameterized to handle the multiple seemingly contradictory options such as the following:

- Open vs. Restricted tenders
- Value based vs. Percentage tenders
- Tenders where Estimated Cost Value (ECV) is published vs. tenders where ECV is not published
- Item-wise vs. Lump sum
- Single EMD vs. Item-wise EMD

Also, the system should be capable of handling the following tender types:

- One envelope
- Two envelope
- Three envelope
- Only Expression of Interest (EoI)
- EoI, followed by restricted tender

Interested bidders can view and download tender documents and also submit their responses online. A provision is made to submit tender processing fees and Earnest Money Deposit (EMD) online using various e-Payment modes such as Credit Card, Direct Debit, Over the Counter and Electronic Fund Transfer. The commercial quotes submitted by bidders are safely encrypted typically using public key of Tender Acceptance Authority (TAA) specified for the tender and kept stored.

The bids submitted by suppliers are opened, evaluated and details of the evaluation are loaded in software. e-GP software has certain in-built checks to ensure that bids received in response to a tender can be opened only when previous step in the process is duly completed and the due date and time specified for the said tender opening has expired. Details of tender evaluation are sent for approval as per department specific approval workflows. Decryption of commercial bids is done using private key corresponding to the public key used for encryption.

A provision is available to update negotiation details and issue letter of intent (LoI) to selected supplier. A tender is termed as awarded when selected supplier accepts the LoI online.

5.4 Auctions

There are two types of auctions: Forward Auction & Reverse Auction. Forward auction is used for sale of items / property etc., wherein a bidder shall quote higher than reserve price set for auction and higher than current bid price. The price curve in forward auction keeps going up. Reverse auction is used for procurement of goods, works and services. Forward auction is typically used by Government for sale of scrap and for auctioning of properties.

In case of Reverse Auction, a bidder shall quote lower than reserve price and current bid price. Consequently, bid price curve keeps going down. Vide its Office Order No. 46/09/03, CVC has authorized government agencies to use reverse auction for procurement provided the entire process is done in a transparent and fair manner. The use of reverse auction for price discovery is not as prevalent as that of the traditionally followed closed bidding method. Few agencies experienced in reverse auctions claim to have achieved significant savings from using reverse auction for price discovery.

Just as it is with tendering, only registered suppliers can participate in auctions. Suppliers participating in auction will be assigned a pseudo name, thus identity of bidders will be kept anonymous. A prequalification process may precede an auction to ensure that only qualified bidders participate in the auction. An Auction Inviting Authority will have the option to define auction type, set auction parameters such as reserve price, increment / decrement value and auction closing time.

5.5 Contract & Catalogue Management

The activities post award of tender till successful completion of the awarded tender will be handled using the Contract & Catalogue Management modules. All works and services tenders reporting milestone based progress will be handled in the Contract Management module. A contract will be created at first wherein the commercials quoted by the selected bidder will be loaded and project milestones will be specified. The contractor executing a work will update details of physical progress made, submit Measurement Book (MB) with details of the work done and also submit invoice seeking payment for the work done as per the milestones defined. A designated government officer will verify if the work is properly executed as per details specified in MB, approve details of physical progress reported and forward invoice to an authorized representative for approval. Once the authorized representative approves, an instruction along with all the required supporting documents will be submitted to the Treasury Department for release of payment to the contractor. Autonomous Government agencies are entitles to release payment on their own. Besides the MB and invoice approval workflows, there is the variation order workflow as well. Contractors may seek to increase tendered quantities on account of additional work not envisaged in the detailed work estimate. Such variation order requests are submitted to officials higher up the hierarchy as per delegation of financial powers for variation order approval.

The Catalogue Management module is designed to handle activities post award of contract for goods procurement. Herein, goods are delivered to end users and those who have received the goods are required to provide delivery acknowledgement directly in e-GP software. The selected bidder will submit an invoice online seeking payment for the goods delivered. Invoice processing will happen as per department specific workflows and financial delegation of powers assigned for approval of invoices. Payment due to suppliers will be made only to the extent intended recipient of goods provide delivery acknowledgement. The process for release of payment for goods procurement is the same as that of works and services procurement.

5.6 Commentary on Functional Coverage of e-GP Implementations in India

Though there is wide spread acknowledgement of the end-to-end scope addressed by e-GP software, not all functional aspects of government procurement is handled electronically in existing e-GP implementations in India. Even matured e-GP implementations such as that in the State Government of Andhra Pradesh, Indian Railways and State Government of Karnataka do not have the fully integrated

end to end e-GP system implemented and fully operational. The center piece of e-GP implementation is e-Tendering module, which has vendor management and auction modules as bolt-on components. The matured implementations have the functionality and workflows in-built to handle the indenting & estimate preparation as well. Only those estimates approved in e-GP software could be taken up for tendering. The implementations in general are found lacking in implementation of the processes post award of contract (i.e.) contract & catalogue management activities. None of the e-GP systems implemented take a holistic view of procurement (i.e. from estimation till contract execution is completed) and facilitate monitoring "actual" financial and physical progress versus project plan specified at the outset. For example, existing e-GP systems do not have the capability to generate the `following reports based on "system³⁴" data:

- a. Overall delay in executing the work (planned versus actual); i.e. covers estimation, tendering and contract management.
- b. Discrepancy between the value of an approved estimate and tendered (i.e. contracted) value of the estimate
- c. Discrepancy between awarded value of a contract and the actual total cost (includes variation orders) of contract post execution

The discrepancy reports explained in points "b" and "c", when read together will provide rich insights typically required by Finance department to exercise financial prudence for expenditure management. The discrepancy reports can be prepared only when an estimate is prepared online and taken through the tendering and contract management modules in fully integrated end to end e-GP software. Existing e-GP implementations in India handle procurement activities using e-GP software till the award of contract. Only an incremental effort is required to extend e-GP implementation to cover contract management activities, since the base infrastructure required for e-GP implementation is already available viz. IT infrastructure (desktops, printers, scanners etc.), internet connectivity in government offices, trained government users and contractors, readily available software framework, DSC's issued to government officers and members of contractor community.

³⁴ Reports can be generated from system data when procurement process is updated real-time electronically in e-GP software. For example, approval of estimates, tender publication, bid submission, Letter of Intent issuance, invoice submission and e-Payment should be done electronically in e-GP software. Accuracy of reports cannot be assured when details of manually completed activities are updated in software for record keeping and MIS reporting (i.e.) in Procurement Management Support System (PMSS) type implementations. Also, feeding in data in software for MIS reporting is redundant work.

6 Integration of e-GP with Other e-Governance Initiatives

A holistic approach is being adopted to implement e-Governance in India in Mission Mode as under the National e-Governance Plan (NeGP). NeGP comprises of 27 Mission Mode Projects (MMP) of which e-GP is named as one of the 7 Integrated MMP's. It is a centrally promoted initiative but the implementation of projects is done in a decentralized manner as per standards and policies laid down centrally. The various MMP's are now being operationalized and implemented; hence clarity on the functional coverage of the various MMP's is not fully clear as yet. Conceptual design and current implementation status of various e-GP initiatives are relied upon to:

- Identify various e-Governance systems with which e-GP systems may have to be integrated
- Define the integration requirements at high level
- Identify possible areas of overlap in functionality (i.e.) functionality regarded as in the scope of e-GP is implemented under a different e-Governance system
- Explain readiness of the enabling infrastructure

A pictorial representation on integration of e-GP with other e-Governance initiatives is provided below:



Integration of e-GP other e-Governance Initiatives

Figure 6: Pictorial Representation on Integration of e-GP with other e-Governance Initiatives

Refer to the Table below for detailed explanation on integration requirements:

S.no.	MMP	Туре	Requirement				
1	MCA21	Integration	Information a. Company incorporation details and audited financial statements (e.g. net worth, turnover and profit & loss) uploaded by companies in Ministry of Corporate Affairs (MCA21) portal b. Corporate Identification Number (CIN) issued by MCA to uniquely identify a company Source MCA21 portal b. Corporate Identification Number (CIN) issued by MCA to uniquely identify a company Source MCA21 portal Destination A supplier's record in supplier management component of e-GP system Usage a. Suppliers can refer to their company incorporation details stored in their vendor registration component as a valid source of information, instead of uploading scanned copies of Certificate of Incorporation, Balance sheet and Profit and loss account when responding to tenders. b. CIN information keyed in by Suppliers (only in case of companies) would be verified within e-GP system to check for duplicate registration and then sent to MCA21 for validity check and to obtain company name. The company name received in response will be keyed into supplier's record. Thus, data consistency across databases will be achieved. Readiness eFiling in MCA21 portal has been made mandatory for the last few years. Hence, MCA21 portal is valid and reliable source of information. This integration can be done immediately.				
2	Income Tax	Integration	InformationPermanent Account Number (PAN) issued by the Income TaxDepartment to all entities (i.e. individuals and companies and otherorganizations). It is compulsory to quote PAN on return of incomeSourcee-Filing service of Income Tax India web siteDestinationA supplier's record in supplier management component of e-GP systemUsagePAN information keyed in by Suppliers (all categories) seekingregistration would be verified within e-GP system to check forduplicate registration and then sent to Income Tax Department forvalidity check and to obtain Name of entity (person or company asapplicable) as registered in Income Tax Department. The namereceived in response will be keyed into supplier's record. Thus, dataconsistency across databases will be achieved.When MCA21 integration has happened. PAN integration can be				
			limited to verification of individual's names.				
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			Readiness				
			The Income Tax system has been operational for more than 5 years				
			and they have already developed an online feature "Know your PAN".				
			This feature can be called upon as a service to run bulk PAN query. This				
			integration can be done immediately.				
			Information				
			Authentication identity of an individual seeking registration in e-GP platform either as sole proprietor or as an authorized representative of company. UIDAI does strong bio-metric de-duplication to establish				
			unique identity (UID) of an individual and then issues a 12-digit unique number to the individual.				
			Unique Identification Authority of India (UIDAI) portal Destination				
			A supplier's record in supplier management component of e-GP system				
3	UID	D Integration	UID and name of individual (sole proprietor and authorized				
			can be sent across to UIDAI for authentication. UIDAI provides "Yes" or				
			"No" in response to such authentication requests.				
			<u>Readiness</u>				
			As of May 2011, OIDAI has generated more than 70 Lakin (7 Million)				
			nace UID authentication services are yet to be operational e-GP				
			system can be suitably modified immediately to capture UID details of				
			supplier (representatives) registered in e-GP platform. The				
			authentication services can be enabled sometime from 2012 and				
			onwards				
			About e-Office				
			This MMP involves implementation of workflow systems within				
			Government to improve efficiency in government processes and				
			service delivery mechanisms.				
			Scope of Overlap				
			e-GP and e-Office are both workflow heavy systems. The setting up of				
			the two systems involves.				
		Overlap in	Definition of user merarchy in software Assignment of users to specific user designations in software				
4	e-Office	scope &	 Assignment of users to specific user designations in software Implementation of workflow processes and department 				
		Integration	specific approval workflows				
			Implementation of user transfers				
			 Implementation of role and access based controls 				
			The same set of users would be required to log into different software				
			systems to complete their pending tasks.				
			Integration Requirements				
			An e-GP system is a procurement specific workflow system with some				
			domain specific capabilities implemented within it. Both G2G and G2B				

			workflows are seamlessly integrated to nandle procurement activities end to end. Integration if any between e-Office and e-GP systems has
			to happen at the process level and such integration is very difficult to
			implement. Despite the overlap in workflow features, the 2 systems
			may have to co-exist
			Readiness
			Office MMD is in initial stages of development. Many government
			e-office while is in initial stages of development. Many government
			agencies have taken the initiative to implement e-Onice system in their
			implementation
			Information
			a. Budget allocation
			b. Bill information
			c. Bill payment information
			<u>Source</u>
			• Treasury software implementation is the source for points (a)
			and (c)
			 Bill information details (b) are provided from the contract and
			catalogue management modules of e-GP software
			Destination & usage
			• Budget allocation details will be fed as inputs for the indent
			management / estimate preparation component for e-GP
			software
			• Bill information along with approval details and supporting
			documents will be generated from contract / catalogue
			management modules of e-GP software and provided as inputs
			for release of payment to supplier
			 Payment confirmation details provided by the treasury
5	Treasuries	Integration	application will be fed into the pertaining contract in e-GP
		C	system to undate navment status
			Readiness
			Computerization of treasury operations has happened in India for
			about a decade now Many State Governments such as that of
			About a decade now. Many State Governments such as that of Karnataka Duniah Bajasthan Gujarat and Madhya Pradesh have taken
			the initiative to implement Integrated Einancial Management System
			(IFMS) in the last couple of years. A total of Ps. 626 Crores (about USD
			(IFIVIS) III the last couple of years. A total of Rs. 626 Crores (about OSD
			125 Million) has been allocated as financial outlay for this engagement.
			The IFINIS systems are internet based systems with centralized
			architecture, hence well suited for integration with e-GP systems. IFMS
			systems are being deployed in most of the States and will be ready for
			the integration within 1-2 years time.
			Deployment of Contract Management component in e-GP software is a
			pre-requisite for integrating e-GP software with IEMS Refer to the
			section titled "Commentary of Functional Coverage of e-GP
			Implementations in India" for details

			There is overlap in functionality between IFMS and e-GP system. Specifically, contract management functionality appears in scope for both IEMS and e-GP systems				
			both in the did e di systems.				
6	ERP	Integration	Informationa) Approved Estimate / Indentb) Tendered Bill of Materials and financials quote by selectedbidderSourcea) The source for (a) is ERP platformb) The source for (b) is tendering module of e-GP platformDestination & UsagePKI-enabled tendering component is not as robust in ERP system as it isin specialized e-GP platforms. Hence, the need for integration as givenbelow:a) Details of approved estimate / indent will be taken as the basisfor preparation of Notice Inviting Tender (NIT) in e-GPplatform.b) Tendered Bill of Materials and financials quote by selectedbidder will be fed into ERP system for contract managementReadinessERP systems are typically implemented in autonomous bodies andpublic sector undertakings of Government. Large PSU's such as IndianOil Corporation Limited have already implemented full – fledged ERPsystem, wherein e-Tendering component of e-GP software has to beplugged into the ERP software. ERP software is far more standardizedwhen compared to e-Office software. Hence, the usage of ERP				
			GP and ERP software.				
7	CSC	Enabling infrastructure	Requirement Infrastructure set-up to access e-GP system from rural areas About CSC An initiative undertaken to initially establish 100,000 rural kiosks in rural areas and further expand the network to 250,000 kiosks. A model Kiosk would have 2 computers, UPS, Printer, Fax, Scanner and broadband connectivity. Usage Supplier community based in rural areas can access e-GP platform from CSC centers located in nearby areas. The non-availability of IT and connectivity infrastructure in supplier offices does not become an impediment in accessing e-GP system. Readiness A total of 83,569 CSC's have been set-up across States in India as on July 2010. ³⁵				
8	State Data Center	infrastructure	Requirement Hosting space and server side connectivity to deploy e-GP hardware				

³⁵ Source: MIT web site

			and software systems
			About State Data Center (SDC)
			SDC is developed as a core infrastructure, wherein e-Governance
			applications and data are centrally hosted in a single location in safe
			and secured manner. SDC is designed to be used as a shared
			infrastructure for hosting multiple e-Governance systems.
			Usage
			e-GP software can be deployed in SDC infrastructure, thereby hosting
			and day to day maintenance and system administration charges are
			minimized and also procurement data is kept in safe storage under
			Government custody
			<u>Readimess</u>
			Government has approved infancial outlay of RS. 1023.20 Crores
			(approx: 575 Willion 050) for development of 50c in 51 States / Onion Territories. Most of the States / UT's have made substantial progress in
			setting up SDC's Five SDC's implementations were at advanced stage
			of implementation as on September 2010.
			Requirement
			Connectivity in geographically spread across Government offices
		E al l'ac	required to access e-GP system hosted in the Internet / Intranet
			About SWAN
			SWAN provides the telecommunication backbone required to connect
			government offices separated by significant geographical distances.
			The vertical component of SWAN connects State Head Quarters (SHQ)
			with District Head Quarters (DHQ) and Taluka Head Quarters (THQ)
			with a minimum band-width speed of 2 Mbps. The horizontal
			component of SWAN will extend connectivity to government offices
			from the nearest Point of Presence (PoP). An estimated 50,000
			government offices will get connected with SWAN implementation.
9	SWAN	Enabling	Usage
		infrastructure	offices using SWAN connectivity and perform various procurement
			related functions such as online approval of estimates tender
			nublication and decryption of commercial proposals e-GP system
			deployed locally in SDC can be accessed over the Intranet established
			within the Closed User Group (CUG) of SWAN.
			Status
			A total of 33 proposals are received from States / Union Territories for
			implementation of SWAN. Of which, SWAN has already been
			implemented in 19 States / UT's. SWAN is in advanced stage of
			implementation in a large number of the remaining States. The total
			project cost for SWAN implementation is estimated at Rs. 2165 Crores
			(approx. 450 Million USD) ³⁷
10	Banking	Integration	Information
TO	Danking	integration	a) Transaction information

 ³⁶ Source: <u>http://mit.gov.in/content/data-centre</u>
 ³⁷ Source: <u>http://www.mit.gov.in/content/swan-financial-assistance</u>

		b)	Confirmation on successful receipt of tender processing fees				
		,	and Earnest Money Deposit in the bank account of				
			government agency inviting tender				
		c)	Electronic Performance Bank Guarantee (e-PBG)				
		d)	Instruction for e-Payment				
		e)	Confirmation on successful completion of e-Payment				
		Source	& Destination				
		•	Transaction information (i.e. tender reference, supplier registration details etc.) is generated in e-GP platform and shared with banking systems either real-time (Credit Card and Direct Debit) or on a deferred mode (Over the Counter and Electronic Fund Transfer)				
		•	For (b), confirmation of successful receipt of money is provided by Banking institutions real-time in Credit Card and Direct Debit transactions and in a deferred mode (within a day or two) in Over the Counter (OTC) and Electronic Fund Transfer (EFT) transactions. Confirmation for the transactions done on deferred mode is done by uploading an electronic scroll in e-				
		•	GP platform				
		·	National e-Payment infrastructure such as the National Electronic Funds Transfer (NEFT)				
		•	Instruction for e-Payment is provided by e-GP system				
		٠	Confirmation on successful completion of e-Payment is provided by Banking institution				
		Remarl	ks				
		•	The real-time payment options are in general used for small value payments made for tender processing fees and supplier registration. Transaction details are transmitted back and forth between e-GP system and banking software in real time and payment reconciliation happens real-time as well The OTC and NEFT options are used for payment of EMD, wherein a detailed mechanism is worked out to share e-GP				
			transaction details and payment confirmation receipt on deferred mode				
		٠	Digitally signed electronic instruction with the following information is sent to Bank to execute e-Payment:				
			 Bank account details available in supplier management 				
			component of e-GP software and				
			 Details of payment / refunds to be made 				
		Readin	ess				
		•	All major Banks in India have implemented Core Banking and				
			have also adopted Reserve Bank of India's (RBI) National				
			Electronic Fund Transfer (NEFT) and Real Time Gross				
			Settlement (RTGS) systems. As on 23 rd Feb. 2011, more than				
			100 Banks and 74000 bank branches across 20,000 cities,				

	 towns and talukas are RTGS enabled. NEFT system is adopted by a similar number of bank branches across India³⁸. There is no known reference of e-PBG system in India. Research & Development work being done by IDRBT (Institute for Development & Research in Banking Technology) vide "e-Check" initiative could be customized to address e-PBG requirement. NEFT / RTGS systems could be used to transfer any amount of amount as EMD in theory. However, suppliers prefer paying EMD in the form of BG due to liquidity concerns. Consequently, BG is the preferred mode of payment for EMD's in excess of 50 Lakhs (approx. > 100,000 USD). Hence, e-PBG has to be implemented to enable e-Payment of EMD for high value tenders as well. e-Receipt of EMD is a key pre-requisite for
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Figure 7: Integration of e-GP with other e-Governance initiatives

³⁸ Source: FAQ under "NEFT System" and "RTGS System", <u>http://www.rbi.org.in/scripts/FAQDisplay.aspx</u>

7 e-GP Technical Architecture

A robust and scalable e-GP system is developed on 3-tier architecture, wherein the three layers being: Presentation, Functional Processing and Data. The software is centrally hosted in Data Center and made accessible over the Internet. Government users and contractors are required to authenticate over the Internet using "User name" and "Password" to login to the platform. A stronger form of authentication would require users to authenticate using their Digital Signature Certificates (DSC).

7.1 Architecting a Unified e-GP Platform

e-GP is a single instance of software used by multiple user types. Both G2G and G2B transactions happen in the same software. Role and access based controls built into the software determine the actions a user can perform in e-GP software. Implementation of e-GP in a government department involves the following key activities:

- Organization hierarchy is defined in software (i.e.) various positions in the hierarchy are mapped into software
- Financial delegation of powers as per departmental rules are tagged onto the various positions
- Workflow patterns are defined as per the process map of department &
- Users are tagged to various positions in the hierarchy

Architecting an e-GP system to handle procurement activities of one single user department is relatively easier as compared to architecting an e-GP system to handle procurement activities of multiple user departments. The procedural framework for procurement such as GFR and CVC guidelines specify the guiding principles as per which Government procurement shall be undertaken. Government departments function as per these principles, but operationalize these principles somewhat differently for some valid reasons. For example:

- Commercial quotes are obtained in Rupee value by some departments or as increase/decrease in percentage value of Estimated Contract Value (ECV) of a tender by others. The percentage method is adopted as a mechanism to disallow contractors from quoting freak rates (in other words, front loading the tender). The % increase or decrease quoted will be applied consistently across work items and payment to contractor will be done as per the rate quoted.
- Agencies engaged in procurement of goods and services do not by default publish Estimated Contract Value (ECV) of tender. Those engaged in works procurement publish ECV by default. However, ECV is not published In case of D-BOOT and PPP projects, where the basis for estimation is not as well defined as that of standardized ECV tenders

A single instance of e-GP software designed to handle procurement processes of multiple different government agencies shall allow users to design a flow suiting their specific needs. For example, Government users can choose to select between Rupee and Percentage tender & also decide whether to publish ECV value in Notice Inviting Tender (NIT). The system will automatically define the subsequent course of action as per the selections made. A robust e-GP system designed to handle works, goods and services procurement of 100+ Government departments will have to be highly parameterized.

The implementation of unified e-GP system does not result in centralization of procurement. Instead, a centralized, single instance of software is used by users from multiple government departments as a share infrastructure to procure works, goods and services they require as per their own department specific rules and regulations.

7.2 Extensible, Reliable and Scalable

The policies and procedures adopted for Government Procurement tends to evolve with time. For example, Government may choose to voluntarily publish information on certain procurement related activities for the public to view and download for free. Such implementation would reduce the workload of department officials engaged for responding to information requests under RTI Act 2005. e-GP software would then have to be suitably modified to reflect this change in policy. Multiple such change requests will regularly come. Also, implementation of certain process reengineering would require change in e-GP software. Considering which, e-GP software should be designed such that incorporation of changes to software will be done with minimal effort. In other words, e-GP software should be extensible.

e-GP is a mission critical software used by Government users and supplier community alike to handle commercial transactions worth hundreds of Crores of Rupees (tens of millions of USD). Hence, care should be taken to ensure that there are no disruptions in procurement activity on account of e-GP system. Most tenders close between 3PM and 5PM (i.e. 1500 and 1700 hours) and contractors tend to submit their proposals just before bid submission timeline. Consequently, concurrent number of users in e-GP system increases in and around bid submission timeline. The stress applied on the system tends to increase during end of year when number of tenders closing at a point in time increases substantially. The software should be designed to handle heavy workloads and subjected to load testing and performance tuning such that it performs reliably as expected even at peak work load. Also, the application should be deployed in a load balanced and clustered environment, thereby high availability is ensured.

e-GP software should be designed to work in a virtualized environment and in a distributed manner. The application can then optimally utilize hardware resources. The deployment architecture should allow for scaling up within the servers (vertical scalability) and also by adding new servers (i.e. horizontal scalability).

7.3 Implementation of Unified Item Code Classification

Government agencies tend to classify and name the works / goods / services procured as per their own department specific norms. Such classification existed because government procurement is a decentralized activity in India. Government agencies call for tenders using the same classification and naming convention in e-GP platform as well. Consequently, many different government agencies will procure the same work / good / service using the same instance of unified e-GP platform. Yet, the e-GP platform will not be able to generate a detailed item-wise MIS report on the expenditure incurred by the State Government / Union Territory / Ministry etc. Only item-wise, department analytics can be generated (e.g.) how many reams of paper did Institution "x" purchase during last year?

A detailed expenditure report on the number of reams of paper purchased by all government departments using unified e-GP platform can be generated only if a "ream of paper" is identified by a unique reference consistently by all the departments. There are two components to this identification:

(i) Adoption of a naming and classification mechanism such as the UN-SPSC³⁹, which is outside the scope of e-GP architecture

³⁹ United Nations Standard Products and Services Code: <u>http://www.unspsc.org/</u>

- (ii) In-build a mechanism within e-GP software to consistently identify a "ream of paper" as a "ream of paper" across unified e-GP platform. The software should specifically have certain checks and balances in-built to ensure that:
 - a. Duplicate item code is not generated
 - b. Tagging of item code to a work / good / service is done correctly

Effective implementation of (ii)-a and (ii)-b is essential for generation of correct MIS reports on itemwise expenditure incurred.

7.4 e-GP Inter-operability Requirements for National e-GP

Since procurement in India is de-centralized, the emergence of multiple e-GP systems is inevitable. The implementation of unified e-GP systems will reduce the number of installations, but still multiple e-GP systems will exist. These many e-GP systems should be made inter-operable to develop a National e-GP system in effect.





Figure 8: e-GP Inter-Operability Requirements for National e-GP

Not all aspects of e-GP system need to be interoperable. For example, estimation approval workflow specific to a user department can function in isolation in an e-GP platform. Similarly, bid submission activities can be specific to an e-GP platform. However, certain activities as detailed below have to be made inter-operable:

- a) <u>National Repository for tenders:</u> NIC has already developed a portal⁴⁰ as "... the Central Source for Government and Public Sector Procurement / Tenders/ Notifications issued by the Central and State Governments and other public bodies across India for goods, services and works." . In the portal, tenders have already been classified broadly as under:
 - Project location
 - Product category
 - Organization name
 - Tender type
 - Type of organization

A large number of tenders are already available in the portal. It is suggested that all tenders published in multiple e-GP systems across India are effectively consolidated and made available in the website: <u>http://tenders.gov.in/</u>.

Certain key integration points are as follows:

- The various e-GP systems shall tag tenders using the same meta data used for categorizing tenders in the tenders.gov.in site
- A protocol has to be agreed to automatically push or pull tender information onto the tenders.gov.in site

The European Union has in place a portal (<u>http://ted.europa.eu/TED/main/HomePage.do</u>) similar to that of the NIC's central source of tender information.



Figure 9: National Database of Registered Suppliers

⁴⁰ <u>http://tenders.gov.in/</u>

b) <u>National Database of Registered Suppliers</u>: A unified State-wide e-GP system has in effect a database of registered suppliers participating in tenders published by State Government agencies. Each supplier in the database is uniquely identified in that e-GP system vide a unique supplier identity reference. However, the same supplier will have a new identity reference in a different e-GP system implemented elsewhere in India. It will not be possible to uniquely identify a supplier consistently across e-GP systems when the supplier has multiple identities. A report on supplier performance can be obtained from multiple e-GP systems only when a supplier is uniquely identified across e-GP systems. Hence, it is proposed that a National database of registered suppliers is developed wherein each supplier is provided with a unique identity reference. This National supplier identity can be inserted in the vendor management module of different e-GP systems across India.



National Database on Supplier's Performance

Figure 10: National Database on Supplier's Performance

c) <u>National Database on Supplier's Performance</u>: It is explained in the sub-section "Vendor / Contractor Management" that details of suppliers' performance in a contract will be stored in vendor management module of e-GP software. Many government agencies will use unified e-GP platform as a shared infrastructure. Consequently, a supplier's performance with multiple government agencies will get recorded in vendor management module of the e-GP software. But the online referencing to contractor's performance could be provided only to the extent the experiences are recorded in the said e-GP software. The intent here is to develop a master database of all suppliers' performances registered in multiple different e-GP systems. A supplier responding to a tender could then provide online reference to experience details recorded in the Master database. Certain standardization and integration is required for development of National Database on supplier's performance:

- The parameters (e.g. timely completion of work & supplier rating) to measure supplier performance should be agreed upon and defined as a standard and supplier's performance should be recorded consistently across e-GP systems as per the standard
- A protocol has to be agreed upon to populate the supplier's performance report (recorded in many e-GP systems) onto the National database

8 Objectives for Implementation of e-GP

The objectives set-forth by Government agencies for implementation of e-GP system are listed in this section. Secondary material from the following sources was relied upon to derive the list of objectives for implementation of e-GP:

- Case study & a World Bank report on e-GP Implementation in the State of Andhra Pradesh (GoAP)
- A report on e-GP implementation in the State Government of Chhattisgarh (GoC)
- A report on e-GP implementation in the State Government of Karnataka (GoK)
- A presentation by Director, DGS&D
- Explanation of e-GP MMP as defined in the compendium of MMP projects available in the MIT web site (MMP_Comp)
- Presentation by Director, DIT on e-Procurement on the Vision for e-GP⁴¹ (MIT)

A tabulated view of project objectives set-forth by various Government agencies for implementation of e-GP is provided in the Table below:

6 7 9	Project Objectives		e-GP Implementation Agencies					
5.no.			GoC	GoK	DGSND	MMP	MIT	
1	 Reduction in transactional costs Time and cost of doing business for both vendors and government Printing and stationery costs Advertisement costs Less paper, green working 	~	×	*	~	×	~	
2	 Greater Transparency Tamper proof tender documents Bidder information kept confidential 	~	~	*	~	~	×	
3	 Standardize procurement processes across government departments Use of standard forms Catalyst for procurement reforms Process reengineering Infrastructure for implementation of policies 	×	~	~	×	~	~	
4	 Fair competition Provide a mechanism to bidders to submit their bids without facing physical threats Arrest problem of Mafia & Cartel formation Realize better value for money Equal opportunity to all bidders Cost savings 	×	×	×	×		~	

⁴¹ The Indian Railways experience could not be included because the available secondary information does not have any reference to project objectives

6	Project Objectives		e-GP Implementation Agencies						
5.110.	Project Objectives	GoAP GoC (GoK	DGSND	MMP	MIT		
5	Minimize delays in tender processing								
	 Faster decision making 								
	Reduced cycle time	Y	Y		Y	Y			
	Enhanced efficiency								
6	Cost savings		~				~		
	 Realize better value for money 	Y	Y		Y		Y		
7	Increase buying power through demand								
	aggregation	Y			Y		Y		
8	Single stop shop for all procurements	\checkmark		\checkmark		\checkmark			
9	Automation of procurement transactions								
	 Reduction in human error 	\checkmark	\checkmark				\checkmark		
	 Parameterized bid evaluation 								
10	Avoid human interface between Contractors and								
	Government officers	~	~	~					
	• Tender information available online 24 x 7	v v		•					
	 Bid from anywhere any time 								
11	Enhanced Monitoring capabilities								
	 Unambiguous view of procurement 		~		\checkmark		\checkmark		
	activities on a real-time basis		Y		Y		Y		
	Real time MIS								
12	Reduced inventory cost	~	~		\checkmark				
	 Better planning of inventory 	•	Y		۲				
13	Greater accessibility to Past procurement				\checkmark		\checkmark		
	information				•		•		
14	Online contract management				\checkmark				
15	Database development								
	 List of works, goods and services procured 				\checkmark				
	Contractors								
16	Improved work culture				\checkmark				
17	Handle end-to-end process online			\checkmark					
18	Reduce corruption	\checkmark							

Figure 11: Consolidated view of objectives for implementation of e-GP

9 e-GP Implementation Approach – A Historical View

The approach adopted for e-GP implementation is explained under:

- Individual driven
- Institutional framework driven
- National policy driven

An overview of key milestones in e-GP development in India is shown in the figure below:



Key Milestones in e-GP Development in India

Figure 12: Key Milestones in e-GP Development in India

9.1 Individual Driven

The approach adopted for implementation of e-GP system has evolved with time. The concept of e-GP was new about a decade ago. Then, IT savvy resources in individual Government departments (individuals falling under "innovators"⁴² category as defined by Rogers (1962)) initiated the implementation of e-Tendering system in their respective departments. Such implementations were done using Commercial Off the Shelf (COTS) software developed specifically to address government

⁴² Innovators are the first individuals to adopt an innovation. Innovators are willing to take risks, youngest in age, have the highest social class, have great financial lucidity, very social and have closest contact to scientific sources and interaction with other innovators. Risk tolerance has them adopting technologies which may ultimately fail.

tendering requirements. At least 2-3 vendors in the market offered readily deployable e-Tendering solutions and also offered e-Tendering as a service. Government did not have to make capital investments in hardware, hosting and software when e-Tendering is taken as a service. Instead, Application Service Provider (ASP) will make the initial upfront investments to get e-Tendering system fully operational as per department's requirements. Government pays service charge (transaction fees) for using the e-Tendering system. Service charges for using e-Tendering system are typically calculated as per number of tenders floated in the system and number of bids submitted. The decision to implement e-GP in a department is typically taken by the department's highest decision making authority.

9.2 Institutional Framework Driven

The adoption of department specific e-Tendering systems gradually increased as the concept got popularized. In this background, few Government agencies initiated implementation of unified e-GP systems. Such implementations are governed by a Steering committee chaired by Chief Secretary level officers with Principal Secretary and Secretary level Government officers as its members. Additional committees have been formed under the Steering Committee to provide guidance on tactical and operational issues arising out of e-Procurement implementation: Project Implementation Committee / Task Force Committee. The key roles and responsibilities of the various committees are as under:

- Provide strategic and tactical directions required during the implementation
- Provide administrative and technical sanction required for major expenditure incurred for implementation of e-GP
- A forum for various government department representatives to come together and discuss procurement policy related issues
- Standardization of procurement processes consistently across government departments and inbuilt the standardized processes within e-GP software as a set of configurable parameters
- Instruct various Government agencies falling under the umbrella of State Government / institution to adopt and use the unified e-GP system set-up. Deployment of e-GP system is done in a phased manner, wherein notification to Go-live in e-GP system is issued:
 - To certain government departments
 - For tenders valued beyond certain value &
 - From a certain date
- Monitor progress made in implementation of e-GP system
- Approve the provision of IT infrastructure (i.e. computers, printers, scanners and UPS) required by user departments to access e-GP system from their respective offices
- Approve the provision of internet connectivity to government offices
- Approve re-engineering of processes

The day to day management of e-GP implementation is assigned to a nodal agency under Information Technology department / e-Governance Secretariat of the implementation agency. Few notable institution driven implementations in India are:

• State Government of Andhra Pradesh (GoAP) ⁴³ pioneered the implementation of State-wide e-GP system in a Private Public Partnership (PPP) mode. A Steering Committee chaired by the Chief Secretary of the State (Chief of all Government Staff in the State) with Secretary level officers and heads of participating departments got constituted to promote coordination

⁴³ Web site: e-Procurement portal of the State Government of Andhra Pradesh: <u>http://www.eprocurement.gov.in/</u>

amongst various Government departments using the State-wide e-GP system. The GoAP's e-GP system became operational in January 2003. The Department of Information and Communication Technology, GoAP has been made the nodal agency to manage and operationalize the e-GP system.

- Northern Railways, Indian Railways initiated implementation of e-GP system in 2005⁴⁴. This system was initially developed to cater to the procurement requirements of 8 zonal Railways and 5 production units. Subsequently, the system has been rolled out to the remaining 8 zonal railways and 1 production unit.
- The State Governments of Karnataka (GoK)⁴⁵ and Chhattisgarh (GoC)⁴⁶ initiated the implementation of unified end-to-end e-GP platform at about the same time. This system has been designed as a shared infrastructure meant to be used by all government departments of the State. The implementation of the two Systems is being done in Private Public Partnership (PPP) mode, wherein government pays private partner transaction fees for using the e-GP platform. A Steering Committee and Project Implementation Committee (Task Force Committee) have been constituted with Principal Secretary and Secretary level officers to manage strategic and tactical issues in the project. A nodal agency has been identified underneath IT / e-Governance department to operationalize the unified e-GP system in both the States went live in 2007.

Government departments who have already implemented e-Tendering / e-GP systems in their respective departments under the individual driven initiative were required to discontinue with their existing implementations and adopt the institution driven unified e-GP platform. Those agencies that had to discontinue their existing set-up often resisted adopting the unified e-GP platform.

Many Government departments continue to take the initiative to implement e-GP systems in their respective departments when there is a void in effort to implement unified e-GP system. About 100+ department specific e-GP systems would be operational in India as on date.

9.3 National Policy Driven

The initiative to operationalize e-GP MMP under the National e-Governance Program (NeGP) happened in the backdrop of institution driven unified e-GP system implementations and continued adoption of e-GP systems in individual departments.

The Apex Committee formed to oversee the implementation of NeGP (chaired by the Cabinet Secretary) in its meeting dated 13th Jun 2006 sought to expedite implementation of e-GP. The Department of Expenditure, Ministry of Finance issued two orders in 2006 & 2007 instructing all the Departments / PSU's to adopt e-Procurement. The order issued in 2007⁴⁷ is more detailed and salient points in the order are as follows:

- The need for development of an integrated e-Procurement platform to link government departments, suppliers and e-Procurement service providers akin to "stock exchange"
- Intent to prepare a detailed project design guideline for e-GP

⁴⁴ Indian Railways e-Procurement System: <u>https://www.ireps.gov.in/</u>

⁴⁵ State Government of Karnataka e-Procurement site: <u>www.eproc.karnataka.gov.in</u>

⁴⁶ State Government of Chhattisgarh e-Procurement site: <u>http://cgeprocurement.gov.in/cg/index.asp</u>

⁴⁷ A copy of the order is available for download in site: <u>http://www.dgsnd.gov.in/e-tendering.htm</u>

• Departments to switch over from manual procurement to e-Procurement beyond certain threshold values by the 1st of April 2007

The wholesome adoption of e-GP as envisaged in the order referred above did not happen.

At around the same time, the Ministry of Commerce & Industry (Department of Commerce) got identified as the line department for implementation of e-GP MMP in 2007. An Empowered Committee of e-GP MMP got constituted in 2009 under the Chairmanship of Secretary (Commerce) and members of the committee include:

- AS & FA (Commerce)
- Additional Secretary (DIT)
- Advisor, Planning Commission
- Director General, DGS&D
- Director General, NIC

A Core Group has been constituted:

- To function as the secretariat
- Act as the Mission leader
- Monitor progress made in e-GP MMP &
- Convener of the Empowered Committee

The key activities of Empowered Committee include:

- (i) Provide overall guidance in important policy matters
- (ii) Accord sanction for all project components as per the financial outlay made by the Union Government

The Department of Commerce engaged National Institute for Smart Governance (NISG) to provide consultancy support required to operationalize e-GP MMP in 2007. Specifically, NISG was engaged to prepare the following deliverables:

- e-GP Framework Document
- Procurement Assessment Report (for 4 entities)
- Detailed Project Reports (for 4 entities)
- Request for Proposal

The procurement entities initially selected to pilot e-GP implementation under e-GP MMP are:

- (i) State Government of Kerala (SGoK)
- (ii) State Government of Himachal Pradesh (GoHP)
- (iii) State Government of Madhya Pradesh (GoMP)
- (iv) Ministry of Health and Family Welfare (MHFW)

GoMP and MHFW dropped out of the pilot. GoMP sought to further develop two e-GP systems already being deployed in the State. Two RFP documents were prepared for Kerala and GoHP. The Kerala government published the RFP in Jan. 2010 but there has not been any substantial progress since then. The GoHP has sought clarifications on funding arrangements for implementation of e-GP, pending which the pilot implementation is put on hold.

Meanwhile, the Apex Committee for NeGP convened on July 2010 emphasized the need to expedite e-GP deployment and has advised Department of Expenditure to issue instructions mandating the implementation of e-Procurement beyond certain threshold value from a certain date. It is not known whether any such mandate has been issued till date.

The idea of a National e-GP portal was mooted in an effort to expedite adoption of e-GP system. Government departments could then handle their procurement activities using the National e-GP portal instead of setting up their own e-GP systems⁴⁸. DGS&D took the initiative to set-up this National e-GP Portal and market its usage as a shared infrastructure amongst government departments across all States /Union Territories in India. Few State Governments such as Himachal Pradesh, Goa, Madhya Pradesh and Uttarakand showed interest in using National e-GP system. However, this initiative did not materialize because the tender floated to select an e-Procurement solution provider to implement the National e-GP system could not be finalized. This tender was a subject of protracted litigation.

Subsequently in 2009, DGS&D sought to pre-qualify up to 3 e-GP Application Service Providers (ASP). The pre-qualification process required technical qualification of the bidders followed by price discovery. This pre-qualification RFP is defined such that Government departments and Public Sector agencies in Center and States can procure e-GP related services from one of the empanelled ASP's as per the pre-qualification terms and conditions. An order issued in DGS&D web-site⁴⁹ states that the RFP for pre-qualification of ASP's is yet to be completed.

Government departments have the option to use the e-GP solution developed in-house by NIC titled "GePNIC". The solution has been operational since 2007 and has handled 52080 tenders worth Rs. 85089 Crores (approx. USD 19 Billion) as on Feb. 2011. NIC offers to host the solution in their data centers located in States across in India and their central data center. The support required for implementing e-GP system would be provided by NIC offices located in States and the offices located in the District level⁵⁰. Interested Government departments can choose to procure the services of NIC directly since procurement from a Government agency need not go through a tendering process. The adoption of e-GP solution developed by NIC is an option available to expedite the adoption of e-GP across India.

The Government constituted a Group of Ministers (GoM) to take all measures including legislative and administrative on January 2011 for "...ensuring full transparency in public procurement and contracts, including enunciation of public procurement standards and a public procurement policy". This GoM constituted a committee on public procurement to study the various issues impacting public procurement policy, standards and procedures. This Committee Chaired by Shri. Vinod Dhall, former Secretary, Ministry of Corporate Affairs, submitted its report in June 2011 and this report is under review.

⁴⁸ There is effort involved in setting up an e-GP system. A detailed RFP has to be prepared, bid process management activities have to be completed, provision of hosting facilities, setting up of server hardware, software requirements gathering, software implementation and audit of implemented software. In institutional driven initiatives, these activities are conducted by the nodal agency under guidance of the various committees constituted to govern the implementation.

⁴⁹ Titled *"To defer the e-tendering opening till further orders/advice"* and dated 14th September 2010, issued by Section Officer (C&T), order downloadable under "New Updates" section of DGS&D website

⁵⁰ The lead story in April 2011 journal "Informatics" details the e-Procurement offerings of NIC: <u>http://informatics.nic.in/archive/april2011.pdf</u>

The Dhall Committee report made many key recommendations to reform public procurement as listed below:

- a) Issue a statement on public procurement policy
- b) Enact public procurement law covering government departments, Public Sector Enterprises (PSE), statutory and autonomous bodies
- c) Creation of a dedicated institutional framework preferably viz. Department of Public Procurement (DoPP)
- d) Reforms on procurement of works, goods and services
- e) Certain changes in procurement operations of large procurement entities viz. DGS&D, Indian Railways and Department of Defense
- f) Training & Capacity Building

The Dhall committee specifically recommended the setting up of a portal with the following key functionality:

- Comparison of prices of similar items
- MIS on time taken to complete processing of procurement activities
- Proportion of procurement done using competitive bidding
- Act as a vehicle for grievance redressal
- Act as a e-Disclosure system initially and subsequently evolve into an e-Procurement system

This portal is envisaged as a centralized system, wherein aggrieved parties may file compliant and ask for a review if procedures are breached. Also, award of contract details will be published. The development of centralized portal is envisaged as a mechanism to enhance competition.

The setting up of this portal would be managed by the Department of Commerce (owner of e-GP MMP) in coordination with the Department of Expenditure (DoE). Technical detailing of the portal would be decided by a committee of representatives from DIT / NIC, DoC, DoE and representatives from major procurement departments.

10 Funding Requirements for Implementation of e-GP

An e-GP system can be set-up by customizing a standard e-GP product as per user requirements and installed in server farm hosted in data center environment. This application can be accessed by Government officers and contractors over the Internet. Besides the set-up costs, there are other major cost components in implementation of e-GP system as detailed in the Table below.

Government procurement activities are de-centralized and spread across geography. A large procurement organization has hundreds of offices and several hundred government officials involved in procurement activities. Refer to the section titled "Procurement Organization" for details. e-GP systems are fully PKI enabled by default, hence each government officer will have to be provided with a valid Digital Signature Certificate (DSC). Government officers would want to handle procurement activities in e-GP system from their own offices and the following investments have to be made to enable that:

- IT infrastructure (refer computers, printers, scanners and UPS) to the extent gaps have to be addressed
- Network connectivity

A standard broad-band connection or SWAN connectivity in a government office would be adequate to address the network connectivity requirements. The challenge lies in connecting hundreds of government offices. It is not adequate if the back-bone of SWAN is ready, instead lines have to be extended to individual government offices (last mile connectivity or horizontal connectivity) from the back-bone.

The development of a unified e-GP system requires setting up of a dedicated e-Procurement cell, wherein the following key activities would be undertaken:

- Centralized supplier registration
- Coordinate issuance to DSC's to government officers
- Workflow mapping (implementation of delegation of powers in workflow)
- User administration (mapping of DSC to users and implementing transfer of Government officers)
- Payment reconciliation and payment accounting (especially when Earnest Money Deposit is handled entirely electronically)
- Handle technical issues
- Procurement of IT infrastructure and internet connectivity required by Government departments
- On-boarding of new government departments and expand adoption of new e-GP functionality
- Grievance handling
- Act as the Single Point of Contact for Government Departments and Supplier community

A full-fledged e-Procurement cell would require about 20 resources employed on a full time basis with at least two senior and highly qualified resources.

The implementation of e-GP in procurement heavy departments such as the Public Works Department (PWD) denotes a major change in functioning of the department. Hence, all users in Department have to be provided hands on training in using the e-GP system. Also, a facility to train contractor community should be readily available. A unified e-GP system catering to more than 100 Government departments would have more than 10,000 suppliers and 5000+ government officials as users. These users will have

to be provided hands-on training at first and then refresher trainings on a regular basis. A complete training set-up (about 30 computers, dedicated training server and a projector) with a couple of full time trainers is required to address the training requirements.

e-GP is a G2B system, wherein new businesses will regularly seek to participate in tenders published in e-GP platform. A mechanism is required for the new users to understand the system's functioning and also to seek clarifications in using the platform. Government users require a set-up to call and register complaints and service requests. Thus, an e-GP system has to be supported by a dedicated help desk, wherein users can dial in and get the required clarifications / register complaints or alternatively send an e-mail. Help desk is a critical support system for the project. It has to work at least 2 shifts or even 24 x 7 and has to be manned with adequate number of resources.

Government users and contractors seek comfort in using e-GP platform especially when they are new users. A team of hand holding support staff is required to guide both government users and contractors in using e-GP platform. This team would have to travel to government offices and help them use e-GP system on-site. A centralized set-up in e-GP cell is typically made available to address hand-holding requirements of contractors.

S.no.	Cost Item	Frequency	Whether fixed?					
Set-up	Set-up Cost							
1	e-GP Software	One-time	Fixed					
2	Server Infrastructure	One-time	Fixed					
3	Training set-up	One-time	Fixed					
Margi	nal Cost (increases with adoption and	usage)						
4	IT infrastructure	One-time	Factor of usage					
5	DSC to users	One-time	Factor of usage					
6	Network connectivity	Recurring	Factor of usage					
7	Software customization	Recurring	Marginal increase					
8	e-Procurement cell	Recurring	Marginal increase					
9	Help-desk	Recurring	Marginal increase					
10	Hand holding support	Recurring	Marginal increase					
11	L2 support	Recurring	Marginal increase					
Maint	Maintenance Expense							
12	Training operations	Recurring	Fixed					
13	System administration	Recurring	Fixed					
14	Data Center Hosting	Recurring	Fixed					

Figure 13: Funding requirements for implementation of e-GP

A set of 14 cost items have been classified as under:

i. <u>Set-up cost:</u> It is cost of establishing an e-GP system. This cost has to be borne regardless of whether e-GP platform is used by a single department or a set of departments. The number of servers required for handling a large number of departments will increase somewhat, but it will not have substantial impact. A full stack of servers (Web, Application, Database and CMS) will have to be installed in a clustered mode to ensure high availability even if implementation is restricted to a single department. Hence, it is advantageous when more number of Government departments use a single instance of software as a shared infrastructure. The set-up costs would

be minimal when e-GP is implemented in PPP mode, wherein the private partner is required to setup the system at his expense. However, the private partner would build in the cost of set-up within transaction fees to be paid for using the system. Thus, government would bear the set-up costs either directly or indirectly. Government departments would not have to pay licensing or capital costs for e-GP software developed in-house by NIC. To that extent, the cost of setting up e-GP system would come down when NIC's e-GP software is used.

- ii. <u>Marginal Cost:</u> The 8 cost items mentioned under this category increases either as a factor of usage or marginally. For example, the number of resources employed in e-Procurement cell will have to be increased when number of departments using a unified e-GP platform increase substantially. But a marginal increase in the resources employed would be sufficient to handle the increase in work load. The cost of network connectivity would not be a factor of usage when government offices are connected using SWAN infrastructure.
- iii. <u>Maintenance expense:</u> The cost of operating e-GP system is specified under this category. This cost has to be borne regardless of usage. For example, at least 2 system administrators would have to be deployed for entire duration of the project to monitor the server infrastructure.

The set-up costs and maintenance expenses are shared across larger number of users in case of unified e-GP systems. And also, the cost of bringing in an additional user department within a unified e-GP platform is only marginal. Considering which, implementation of unified e-GP systems should be encouraged.

The cost estimates in Rupee value projected by NISG for implementation of unified e-GP platform is given in the Table below:

S.no.	Department name	Cost Estimates
1	State Government of Himachal Pradesh	Rs. 27.58 Crores (app. 6 Mill USD)
2	State Government of Delhi	Rs. 28.66 Crores (app. 6 Mill. USD)
3	Dept. of Health and Family Welfare	Rs. 32.62 Crores (app.7 Mill. USD)
4	State Government of Madhya Pradesh	Rs. 20 Crores (app. 4 Mill. USD)
Remar	ks	

* Source: Presentation on e-GP MMP implementation by NISG

** The list of cost items taken into consideration for preparation of these cost estimates is not known

11 Overview of Selected e-GP Systems

11.1 Snapshot View of Selected e-GP Systems

A set of 5 e-GP systems are summarized in this section. All the 5 systems are large sized implementations and they have been functioning in excess of 3 years. A snap-shot view of the 5 systems is provided below:

5 no	Description	Five selected e-GP Systems						
5.110.	Description	GoAP	Railways	GoK	GoC	GePNIC		
1	Start date of implementation	2003	2005	2007	2007	2008		
n	Coverned by	Stooring Committee	Pailway Poard	Stooring Committoo	Empowered	Client specific		
Z	Governed by	Steering Committee	Kallway Dualu	Steering Committee	Committee	arrangement		
2	Nodal Agapay	IT &	CDIS			IT & Finance dent		
3	Notal Agency	Communications	CRIS	CEG	CHIPS	IT & Finance dept.		
4	No. of departments using the	> 200	> 25	× 100	17	Many States &		
4	system			> 100	12	Govt. depts		
5	No. of tenders published	100,000	191,000	> 20,000	7,755	52,080		
6	Value of tondors bandlad	INR 3 Lakh Crores /		LISD 1E Dillion	INR 21,727 Crores	INR 85089 Crores /		
0	value of tenders handled	USD 65 Billion			5 Billion USD	USD 19 Billion		
7	No. of suppliers registered	> 10,000	> 10,000	> 10,000	3519	> 10,000		
8	Implementation model	PPP	Govt. owned	РРР	РРР	Govt. owned		
9	Commercial bid security	PKI	PKI	PKI	PKI	PKI		
10	Training	Yes	Yes	Yes	Yes	Yes		
11	Help desk	24 x 7	8 AM – 8 PM	9 AM – 9 PM	Yes	24 x 7		
12	Hand-holding support	Yes	Yes	Yes	Yes	Yes		

Figure 14: Snapshot view of selected e-GP systems

11.2 State Government of Andhra Pradesh (GoAP)

Web site: http://www.eprocurement.gov.in/

<u>Initiation:</u> GoAP took the initiative to implement a State-wide e-GP system in 2002 in Private Public Partnership (PPP) mode. A Request for Proposal (RFP) was floated to select the vendor for implementation of the envisaged e-GP system. Bid process management for the tender was done, as per which a vendor was selected and agreement with the vendor was signed on 17th June 2002. Initially, four Government departments were selected to pilot the implementation namely:

- Andhra Pradesh Technology Services Limited (APTS)
- Andhra Pradesh State Road Transport Corporation (APSRTC)
- Commissionerate of Tenders (covering Irrigation and Command Area Development Department & Roads and Buildings Department)
- Andhra Pradesh Health Medical Housing & Infrastructure Development Corporation (APHMHIDC)

The system went operational in January 2003 and a Government Order dated 6th of July 2004 was issued instructing *"all Departments, Public Sector Undertakings & Local Bodies of the GoAP"* to procure *"all works with an estimated cost value of Rs. 10.00 Lakhs and above, goods & services with an estimated cost value of Rs. 5.00 Lakhs and above through e-Procurement only from 01-07.-2004"*

<u>Institutional Mechanism</u>: This implementation is governed by a high level Steering Committee (Project Implementation Committee) chaired by the Chief Secretary of the State with Secretaries, Heads of all the participating departments and representative of the private partner as members of the Committee. The Information Technology and Communications Department acts as the nodal agency managing implementation of the e-GP system

<u>Functional and Geographical Scope:</u> e-Tendering module is the core software module implemented in this system. e-Auction and supplier registration are additional e-GP components implemented. It is not clear whether contract management and indent management modules of e-GP system were implemented. As on December 2010, 219 departments used the system to handle their procurement activities.

<u>Technology & Security:</u> This system is implemented using standard 3-tier architecture with the following distinct layers: Presentation, business logic and database. The security in this e-GP software is implemented using Public Key Infrastructure (PKI). *"The data (price bid) is stored in encrypted format in the database and cannot be viewed in readable format by anyone including the database administrator prior to decrypting the bid by the buyer with his private key on lapse of specified time and date of opening of bids.⁵¹" Refer to the communication by the Secretary, IT & C department for details on security implementation in the GoAP system. This system has been subjected to a security audit by a reputed 3rd party audit agency.*

<u>Eco-System</u>: Government officers and vendors were provided approximately 15,000 hours of training on using the software application. A 24 x 7 help desk was established, wherein users of the system could contact and seek guidance in using the system and also register complaints. A set of Government officials trained as Chief Information Officers (CIO) in Indian Institute of Management (IIM), Ahmadabad,

⁵¹ Source: Communication by Sri. Narsingh Rao, Secretary, IT & C Department, GoAP

played the role of change agents. The CIO's interfaced between the e-GP vendor's technology team and provided the domain expertise required for customization of e-GP software and also proposed re-engineering of processes within government departments.

<u>Business model</u>: This project is implemented in PPP mode, wherein contractors are required to pay transaction fees for using the platform to submit their bids online. This transaction fees is capped such that it is on par with or lesser than the tender document fees paid by suppliers in the manual system as "tender document fees".

<u>Current Status</u>: This project is regarded as a pioneering initiative in e-Governance in India. It won the following awards:

- Golden Icon Award of the Government of India, Department of Administrative Reforms in 2003
- PC Quest award for the best e-Governance project in the country with maximum social impact in 2005
- United Nations Public Services Award 2007

The private partner operated this system on Built Own Operate (BOO) model since it went live in March 2003 until December 2010. After which, the system (hardware, documents and passwords for servers and software applications) has been transferred to Andhra Pradesh Technology Services (APTS). By then, 219 departments used the system to process 100,000 tenders amounting to more than Rs. 3 Lakh Crores (approx. 65 Billion USD). The savings resulting from this implementation is estimated Rs. 15,000 Crores (approx. 3.5 Billion USD)⁵².

11.3 Indian Railways

Website: https://www.ireps.gov.in/

<u>Initiation</u>: The Northern Railways unit of Indian Railways initiated implementation of e-GP system in May 2005 on a pilot basis as per guidance provided by the Railway Board. Indian Railways has 25 procurement units and the intent is to develop a unified e-GP system to handle procurement activities of all the procurement entities under Indian Railways. This pilot implementation has been extended to 13 zonal Railways / Production units as on December 2009⁵³. This facility has been subsequently rolled out to additional 9 zonal Railways / Production units.

<u>Functional and Geographical Scope</u>: The procurement units using the IREPS site mainly for handling their tendering activities. A centralized vendor registration module has been implemented. The auction module of e-GP is likely to be deployed soon. The roll out of contract tracking is scheduled as Phase III activity, wherein e-Tendering is implemented in Phase – I and e-Auctioning in Phase 2. IREPS is envisaged as a unified e-GP platform to be used by all procurement entities in Indian Railways.

<u>Technology & Security:</u> IREPS is developed using standard centralized, layered, web based architecture, wherein government users and contractors can access the site over the Internet. This site has been developed using the latest technology and security features. *"Salient security features deployed include asymmetric cryptography, PKI enablement, digital signature, 128 bit 'Verisign' SSL etc. apart from other security features like user name, password, digital authentication, role based action/access privileges, audit trail, time synchronization for all Production servers with IST acquired from National Physical*

⁵² Source: "C1 India Transfers e-Procurement Project to APTS", Business Standard dated 12th Jan. 2011

⁵³ Source: Indian Railways Vision 2020 and White Paper

Laboratory. The data centre has been designed to be fully secure using various hardware and software utilities like firewall, Load Balancer, IPS, Antivirus etc. The site is compliant to IT Act 2000....⁵⁴" The security systems implemented in IREPS has been tested by an independent 3rd party auditor: STQC, Government of India

<u>Eco-System</u>: Training of Government users and contractors happen across multiple locations in India. Training of users is done under 4 categories namely:

- Familiarization training
- Railway user training
- Administrator training &
- Vendor training

A dedicated help desk has been set-up to address problems reported by the users. Users can report problems through a web link, by sending an e-mail or telephonically. Telephonic support is available from 8AM to 8PM on Monday to Saturday except Gazetted holidays observed by CRIS.

<u>Business model:</u> The e-GP site <u>https://www.ireps.gov.in/</u> is being developed by the IT arm of Indian Railways: Center for Railway Information Systems (CRIS), Government of India. The copyright of this site is with CRIS.

<u>Current Status</u>: The status on adoption and usage of IREPS system as on 18th May 2011 is as follows:

- Number of vendors registered: 11,650
- No of tenders published: 191,000

11.4 State Government of Karnataka

Website: https://eproc.karnataka.gov.in/

<u>Initiation</u>: The State Government of Karnataka published a RFP for selection of vendor for implementation of unified end to end e-GP system in PPP mode. Bids received in response to this RFP were evaluated and as per tendering process, a private partner has been selected. Contract with the private partner was signed on December 2006. The State Government suitably amended the KTPP Act to enable implementation of unified end to end e-GP system as given below vide amendment dated 2nd of May 2007:

"(1) There shall be a single unified e-procurement platform for all procurement entity which may be notified under sub-section (2)

(2) With effect from such date, as may be specified by the Government, by notification, a procurement entity in respect of a class of procurement if any, as may be notified shall procure its procurements through the e-procurement platform."

This Amendment came into force with effect from the 27th of November 2006.

The e-GP software proposed for deployment by the private partner was reviewed component-wise and approved by a committee of Government representatives and domain experts. The various modules of e-GP software went live in sequence as given below:

• Supplier Registration

⁵⁴ Source: "About Us" link in <u>https://www.ireps.gov.in/</u>

- Indent Management
- E-Tendering
- Contract & Catalogue Management module
- e-Auction

Government departments were individually "notified" to Go-live in the e-GP system from a certain date for tenders valued above certain value (i.e. Rs. 50 Lakhs, approx. 100,000 USD) as per provisions of KTPP Act.

<u>Institutional Mechanism</u>: Government constituted a Steering Committee Chaired by Chief Secretary and with various Secretaries and Principal Secretaries as its members vide Government Order Reference DPAR 26 EGV 2003 BANGALORE dated 3rd of June 2003. The initiative to implement e-GP system got driven by the e-Governance Secretariat. A Project Implementation Committee and Working Group were constituted to provide tactical and operational guidance required for implementation of the project. A Society under the e-Governance Secretariat has been identified as the nodal agency to manage implementation of e-GP. An e-Procurement cell has been constituted within CEG to manage all operational aspects of deployment of e-GP system.

<u>Functional and Geographical Scope:</u> The e-GP system in GoK is envisaged as a unified end to end e-Procurement platform. All modules of the software have been approved for Go-live. However, the modules being actively used are: Supplier Registration, Indent Management, e-Tendering and e-Auctions. The software to handle post tendering activities viz. Contract Management and Catalogue Management modules is ready but yet to be fully deployed. This System has been developed as a unified platform to be used as a shared infrastructure by all procurement entities of the State. Few agencies outside the State such as Hindustan Aeronautics Limited (HAL) have also used this system as a shared infrastructure.

<u>Technology & Security</u>: The e-GP software has been developed based on open source stack of software. The application is hosted centrally in a data center and users can access this application over the Internet using standard web browser. New government departments can be created by way of configuration in this unified e-GP software. Thus, one single instance of software has been designed to address procurement functionality of multiple government departments. Security in this platform is addressed by PKI implementation, vide:

- Users have the option to enable DSC based login authentication
- Workflow approvals and key processes in software have to be digitally signed by an authorized official
- Commercial quotes submitted by bidders are encrypted using public key of the concerned Tender Acceptance Authority (TAA). The encrypted bids can be opened only using the corresponding private key and after necessary pre-conditions (e.g. technical bid evaluation completed) are satisfied

The system has been subjected to audit by a reputed 3rd party audit agency, wherein the audit comprised of the following activities:

- Functional audit
- Security audit
- Systemic infrastructure audit
- Hardware security audit

- Vulnerability testing
- Penetration testing &
- Load testing

<u>Eco-System</u>: Government has established 2 training centers in the State Capital (Bangalore), each with training capacity of 30 seats. An additional training center with 25 seats has been set up in different geography in the State: city of Dharwad. A dedicated training server is hosted in a centralized data center and can be accessed anywhere over the Internet. Training of Government officers and contractors is a continuous activity. As on 31^{st} of March 2010, a total of 4000 Government officials and 2500 contractors have been provided hands-on training in using the e-GP system. A dedicated telephonic help desk has been set-up to provide guidance and clarifications to government users and contractors in using the e-GP system. Requests for training and hand-holding support can also be registered with the help desk. The help desk functions from 9AM – 9PM on all Government working days. Government users have been provided with extensive hand-holding support on-site in their respective offices until they got comfortable in using the e-GP system. The e-Procurement cell was manned with resources hired from the market and this team played a critical role in implementation of this system.

<u>Business model</u>: This project is being implemented in PPP mode, wherein private partner has invested to set-up and operationalize the e-GP system. The e-GP system is hosted out of the Data Center facility provided by Government and training of government users is done in training set-up established by the Government. The cost for up-gradation of IT infrastructure and provision of internet connectivity in department offices is borne by the Government. Private partner earns revenue from this project by charging transaction fees for usage of the system. Usage herein refers to:

- Processing of supplier registration application
- Submission of online bids by a bidder
- Handling of contracts online &
- Online submission of invoices by contractors

The transaction fees is paid by suppliers / contractors to GoK, which gets consolidated and after due processing is paid to private partner for the services rendered. Payment to the contractor is done only to the extent the system get used. This project is being implemented in BOO(T) model.

Current Status:

The system has about 15,000 registered contractors and 4500 government users. In excess of 100 Government departments use this system as a shared infrastructure. More than 20,000 tenders valued at 15+ Billion dollars have been published in this platform by 115 Government departments since inception of this project. Most of the Government departments now use the platform to publish tenders valued at Rs. 10 Lakhs (approx. 25,000 USD) and above.

11.5 State Government of Chhattisgarh

Web-site: http://cgeprocurement.gov.in/cg/index.asp

<u>Initiation</u>: The State Government of Chhattisgarh (GoC) has implemented a comprehensive end to end e-Procurement platform in Private Public Partnership (PPP) mode. The implementation of this platform is being managed by Chhattisgarh Information and Biotech Promotion Society (CH*i*PS), a Society promoted by the State Government. NISG provided consultancy support to CH*i*PS in conceptualizing the unified end to end e-GP system. A detailed RFP was published and a private partner was selected as per standard tendering procedures. The Master Services Agreement (MSA) with private partner was signed on 19th December 2006. The system was inaugurated by the Hon'ble Chief Minister of the State and went live on 14th of August 2007. The system was initially piloted in 5 Government departments in the State viz.:

- i. Public Works Department (PWD)
- ii. Water Resource Department (WRD)
- iii. Public Health Engineering Department (PHED)
- iv. Health Department &
- v. Chhattisgarh State Infrastructure Development Corporation (CSIDC)

The Chief Secretary of the State issued an order – 246/CS/2007 dated 5th December 2007 – mandating making the adoption of e-Procurement for all tenders valued Rs. 20 Lakhs and above (approx. USD 50,000).

Institutional Mechanism: An Empowered Committee headed by the Chief Secretary of the State and with Secretaries of 10 Government departments was constituted in May 2005. This committee has provided strategic guidance for implementation of this project. A task force committee headed by Secretary, PWD and Heads of departments as members was constituted in July 2007 to provide guidance at the operational level. The day to day management of project implementation is undertaken by CH*i*PS. A nodal officer for e-Procurement is identified in each of Government departments using this e-GP system.

<u>Functional and Geographical Scope:</u> The e-GP system is designed as a State-wide system to be used by all Government departments, organizations, boards etc. The key functional components of this e-GP software are:

- Supplier Registration
- Indent Management
- E-Tendering
- Contract & Catalogue Management module
- e-Auction

<u>Technology & Security</u>: It is a web based platform hosted in centralized server environment in the Internet. The application has been developed as per n-tier architecture with Web, Application and Database servers. Government users and contractors alike can login to the platform using the Internet. Security in this platform has been implemented using PKI. Commercial proposals submitted by bidders are kept encrypted.

<u>Eco-System</u>: Training of contractors was done in the various districts of the State with help of the local District Administration. Government officers were provided with hands on training in using the system in batch of 25-30 users per match in the city of Raipur. GoC has plans to roll out the training of Government offices to multiple districts in the State. Both Government users and contractors can visit premises of the Application Service Provided to get trained. A detailed manual with screen shots has been prepared to training the users, which can be downloaded by any interested bidder to get acquainted with software. A help desk facility has been created to address concerns raised by Government users and contractors in using the e-GP platform.

<u>Business model</u>: This project is being implemented in PPP model, wherein ASP has invested to set up and operationalize e-GP system on a BOO(T) basis. ASP has been recuperating the investments by charging transaction fees from bidders using this system. The operations and maintenance phase of this project is for a duration of 5 years.

<u>Current Status</u>: The status on usage of this system as on June 2011 is as given belo:

- Number of departments using the system: 12
- Number of registered vendors: 3519
- Number of tenders published: 7755
- Estimated value of tenders published: INR 21,727 Crores (app. 5 Billion USD)

This project won the CSI – Nihilent e-Governance Outstanding project award for the year 2007-2008 under the best e-Governed project category.

11.6 GePNIC

<u>Initiation</u>: NIC initially piloted deployment of a 3rd party e-GP system in their office from May 2006 – Feb. 2007 to understand the nuances of development, implementation and deployment of e-GP system. National Informatics Center (NIC) took a decision to develop e-GP software in-house subsequently. The software was developed in Tamil Nadu State unit of NIC and initial efforts were focused on development of the e-Tendering component. An initial version of the software was released in Jan. 2008 and this software was piloted by Tamilnadu State Government. This software was subsequently deployed in the Orissa State Government.

<u>Institutional Mechanism</u>: NIC is engaged in development of software (i.e. GePNIC) to address e-GP system requirements of various Government departments in India. The State Governments, PSU's and Ministries deploying NIC's software will need to set-up the institutional mechanisms required for implementation of e-GP in their respective organizations. Specifically, each implementation would require the following institutional set-up:

- A governance establishment for e-GP implementation related decision making &
- A nodal agency to manage day to day operations (e.g. DSC issuance & supplier registration)

The Secretary (IT) in the Government of NCT, Delhi has issued a circular dated 5th of May 2011 with the approval of Chief Secretary about adoption of NIC's e-GP platform for all tenders valued more than Rs. 2 Lakhs (approx. 4,500 USD) from the 1st of May 2011.

The Implementation of e-GP in National Rural Roads Development Agency (NRRDA) Ministry of Rural Development for PMGSY tenders is being taken up on a project mode. In the meeting dated 1st of June 2009, it has been decided that e-GP system will be implemented across multiple States in two phases. A set of 9 States have been selected to implement e-GP platform in the 1st phase: Himachal Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Uttar Pradesh, West Bengal, Tripura and Sikkim. Overall project management of this implementation is being carried out by NIC. NRRDA and State Governments will provide nodal officers to manage this implementation.

<u>Functional and Geographical Scope:</u> The e-GP system of NIC mainly addresses the tendering functionality and has supplier registration component. This system has been designed as a unified platform to cater the procurement process requirements of multiple departments in a single instance of

software. "The solution can be configured for use by an organization at its apex level, and at multiple subordinate levels, at which tenders could be independently floated. Bidder categories/ classes are also configurable."⁵⁵

<u>Security</u>: Security in GePNIC is implemented using two-factor authentication using DSC, role based user access, use of PKI for and data encryption in client side. This system has been subject to security audit by two independent agencies, one of which is CERT-IN certified auditor. The e-GP system deployed by the Department of Rural Department in Orissa State to handle PMGSY tenders has been assessed by a team from Asian Development Bank (ADB) and it has been rated as "well developed and resourced system" meeting "... all essential *ADB requirements for e-procurement including transparency of the process, non-discrimination of bidders, equality of access, open competition, accountability, and security of process..."* with "...well developed security, process management, communication, record keeping and audit capability.⁵⁶"

<u>Eco-System</u>: Training of Government users and contractors is provided by NIC to enable change management. Train the trainer program has been implemented to address training requirements for PMGSY project, wherein 20 Government officials would be trained per State. Detailed hands-on training has been provided to 1500 government users and 2000 contractors in the State of Orissa. 24 x 7 help desk phone / e-mail support has been made available to support users seeking clarifications in using the e-GP system. Extensive hand-holding support is provided to government users to enable them to use the software. 400 Facilitation centers were developed across the State of Orissa to be used by contractors for bid submission activities by paying a nominal fee. District Information Officers of NIC located in Districts were trained to provide support to government officer's located in the concerned district. The NICCA, a sister concern of NIC, was engaged to issue DSC's to government officers. The CA's addressing the private sector requirements were contacted to provide DSC support required by the bidders.

<u>Business model:</u> NIC provides the server infrastructure, data center set-up required for hosting the servers, base e-GP software, department specific customizations, training, hand-holding and project management support. Government departments can procure e-GP services from NIC directly without following a tendering process, as NIC is an arm of the Department of Information Technology. NIC provides a detailed proposal including the cost estimate to the departments seeking e-GP services. The cost of client side IT infrastructure (desktops, printers etc.) and internet connectivity is borne by user departments.

<u>Current Status:</u> Government departments in the following States have implemented this software: West Bengal, Haryana, Uttar Pradesh, Chandigarh UT, Jharkand and Punjab. PSU's like Mahanadi Coalfields Limited (MCL) and Orissa and Visakhapatnam Port Trust and the Ministry of Rural Development in the Central Government has implemented this solution to handle tenders under Pradhan Mantri Gramin Sadak Yojana (PMGSY) Scheme in 21 States. As on Feb. 2011, 52080 tenders worth Rs. 85089 Crores (approx. 19 Billion USD) have been handled using this software. GePNIC has won G2B initiative of the year award from eIndia for the year 2009.

⁵⁵ Source: "Government e-Procurement System of NIC", Informatics Vol. 19, No. 4, April 2011

⁵⁶ Source: "Assessment of the Orissa Department of Rural Development Electronic Procurement System", dated February 2009, prepared by <u>www.intgov.com</u> on behalf of the Asian Development Bank

12 e-Auction of 3G & BWA Spectrum

The use of e-Auction by the Department of Telecommunication (DoT) for sale of rights to use Spectrum for third generation (3G) mobile phone services and Broadband Wireless Access (BWA) Spectrum has had huge success in garnering higher than expected sale proceeds. The Government initially estimated the sale proceeds at less than 35,000 Crore rupees (approx. USD 7.5 billion) but 34 days and 183 rounds of intense bidding for 3G spectrum and 16 days and 117 rounds of bidding for BWA fetched more than 106.262 Crore rupees (approx. USD 22.5 Billion); thrice the estimated price. No single player dominated the auction proceedings. The 22 circles auctioned for 3G spectrum are awarded to 7 bidders and the maximum number of circles a bidder could win is 13.

This auction was considered as a huge success and widely regarded as secure, transparent and well planned. Best practices for auctioning spectrum were studied from across the World to define the auction rules. Also, a reliable e-Auction solution was selected and mock auctions were conducted upfront in an effort to get the bidders accustomed to the auctioning process. Key stakeholders were invited to evaluate the auction system in an effort to demonstrate transparency in the auction process. Thus, the success of this auction is achieved.

Earlier to the sale of spectrum, e-Auction is used for sale of coal, spices and tea. The tremendous success achieved from e-Auction of spectrum has highlighted the potential to replicate the use of auction for sale of oil blocks, Land parcels, Airport privatization, liquor contracts, large construction contracts, power generation projects and road and construction projections.

13 Security in e-GP

The understanding of e-GP security implementation requirements has evolved based on about 10 years of e-GP implementation experiences in India. CVC has issued detailed security guidelines dated 17th September 2009 for e-GP systems. The STQC Directorate in DIT has prepared comprehensive and detailed guidelines for compliance to Quality and Security Requirements of e-Procurement system. A draft of this guideline was made available to public for comments and suggestions until very recently. This guideline has been prepared as per:

- Reference security standards such as the ISO 27001
- Known risks in implementation of e-GP systems
- Security considerations issued by CVC
- Compliance to Government of India's GFR procedures and
- Compliance to the IT Act of 2000

Stakeholders will find an e-GP system complying with the security guidelines prescribed by STQC as "...secure, transparent, auditable & compliant with government procurement procedures⁵⁷".

The testing and security requirements for e-GP are explained under four layers namely:

- Process
- Infrastructure
- Application &
- Data

The subjects discussed under each of the 4 layers are listed below:

- Process
 - Adherence of Operations & Maintenance of e-GP system is as per ISO 27001 security standards
 - Adherence to established user centric and technology centric Service Level Agreements (SLA)
- Infrastructure
 - Server deployment architecture is done as per standard norms, wherein critical systems are kept protected behind the firewall and traffic flows through the server infrastructure as envisaged
 - Vulnerability assessment of servers and network devices
 - Penetration testing to learn about vulnerabilities in e-GP system
 - Performance testing to study load handling capabilities of e-GP system
- Application
 - Application design review
 - Application code review
 - Application functional testing
 - Application security testing &
 - Application usability testing
 - Application interoperability and compatibility testing
- Data

⁵⁷ Source: Guidelines for compliance to Quality and Security Requirements of e-Procurement system, STQC

- Confirm that sensitive data and user credentials are encrypted and stored using strong cryptography
- Data communication security audit

The large e-GP implementations in India have been subjected to security audit by independent 3rd party audit agencies, wherein the guidelines for audit would be similar to the detailed guidelines prepared by STQC. The STQC guideline has consolidated GFR, CVC guidelines and compliance requirements to IT Act of 2000 in one document and it can be used as a standard reference document for security audit of e-GP systems. This guideline document can be reviewed at regular intervals and continuously evolved based on feedback from e-GP implementation experiences.

Implementation of certain advanced security measures would tend to cause inconvenience and make e-GP system user unfriendly. Hence, there is a need to strike a balance between security implementation in software and software user friendliness. A couple of examples are given below as illustration:

- Encryption of commercial bids by the concerned supplier's public key is a very strong method of
 securing the data. The supplier needs to decrypt commercial using his private key to make the
 commercial quotes readable. The implementation of this feature technically should not be a
 challenge when PKI based encryption is already implemented in software. However, this
 implementation will have procedural issues especially because government will be dependent
 on the supplier to decrypt commercial quotes and to go ahead with commercial bid evaluation.
- Tender opening by 2 or more government officers using DSC is prescribed as a security measure. Implementation of this feature will require the 2 or more government officers to be available (possibly in the same location) for tender opening activity. Such dependencies cause inconvenience to users and also introduce delays in tender processing
- It is safest when key used for decryption of commercial quotes is kept only in original copy. This
 implies that only the concerned government officer can decrypt commercial quotes using his or
 her private key. However, commercial quotes cannot be decrypted if original copy of the private
 key is lost or corrupted. In which case, that particular tender has to be necessarily recalled.
 Hence, it is recommended that a duplicate copy of private key should be made and kept in safe
 storage. The existence of duplicate copies of private key however has an adverse impact on
 security.

14 Implementation Challenges

14.1 Decision to Adopt (join or not join) an Unified e-GP System

Procurement function cuts across an organization and hence, full-fledged implementation of e-GP system denotes a major change in functioning for government departments (end users) and especially for procurement heavy departments. Since procurement is a decentralized function, each government department will prefer to independently take a decision on whether to adopt (i.e. join or not join) e-GP system. The orders mandating the adoption of e-GP in Government departments do not by default result in adoption of e-GP system in departments, instead they only trigger the decision making process within the departments. Decision makers will tend to evaluate the following before agreeing to start e-GP operations in their respective departments:

- Infrastructure readiness (i.e. IT infrastructure and connectivity)
- Fitment of e-GP software
- Readiness of supplier community
- Impact of e-GP adoption in their day to day activities
- Availability of training and handholding support
- Financial commitment required from department for implementing this system
- Potential benefits

The implementation approach envisaged should have the means built within to satisfactorily address the various concerns raised by government departments. For example, the IT infrastructure and network connectivity required by users to access e-GP platform from their respective offices have to be made available and e-GP software should have adequate flexibility built within to handle procurement activities as per department specific procedural and workflow requirements. There is bound to be resistance when government users are asked to travel outside their office (facilitation centers etc.) to use e-GP system. Also, government departments would not want to modify their internal procedures and workflows in order to fit their organization within the software. The decision makers will be more inclined to adopt an e-GP system when key concerns raised by decision makers are already addressed in the project implementation approach (i.e.)

- Assurance on e-GP software availability as per certain well defined Service Level Agreements (SLA)
- Availability of a mechanism to provide IT infrastructure on a gap filling approach
- Provision of network connectivity to government offices
- Provision of Hand-holding support to users until they are fully comfortable in using the system on their own
- Availability of facility(ies) to provide hands-on training and
- Availability of Telephonic help desk

Decision makers are more inclined to adopt an e-GP system when their peer entities have already started using the e-GP system. Hence, it is important to focus the initial implementation efforts to attract adoption of e-GP system by government departments engaged in varied procurement activities. For example, the adoption of e-GP system by Public Works Department (PWD) will act as a reference point to attract participation from other works procurement agencies and the adoption by Transport department will act as a benchmark for agencies engaged in goods procurement.
14.2 Change Management

The implementation of e-GP requires both government users and contractors to transact procurement activities online using software. The e-GP system users will have to get accustomed to the new way of functioning, get the required set-up (i.e. DSC, suitably configured desktop & connectivity), learn to use e-GP software (e.g. upload commercial quotes in the correct slot in e-GP software) and avoid common mistakes (e.g. attempting to submit bids few minutes before bid submission). Extensive hands-on training and hand-holding support are required to enable smooth transition to use of e-GP for handling of procurement activities. Hand-holding support to government users would have to be provided in their respective offices.

Nodal officers have played an important role in enabling implementation of e-GP system. The GoAP trained a few selected government officers as Chief Information Officers (CIO) in IIM, Ahmadabad and these CIO's facilitated implementation of e-GP in their respective departments.

Both Government users and contractors tend to have concerns on implementation of security in e-GP system (i.e.) especially about the handling of commercial quotes. This has to be addressed through training users about the implementation of PKI based cryptography for encryption of commercial quotes. e-GP system should be subjected to security audit at regular intervals and key highlights of the audit results can be made public. This will enhance trust and confidence amongst users of the e-GP system.

Workshops are organized to enable users to share their e-GP implementation experiences and to obtain feedback from users on their concerns in using e-GP system. The concerns raised during workshops have to be addressed in a timely manner

Hand-holding support to contractor community can be provided through development of e-GP facilitation centers spread across geography. Contractors could then submit their bids using facilities available in the facilitation centers. A telephonic help desk facility is a key infrastructure, required to provide guidance to contractors and government users in using e-GP system.

15 Key Benefits Reported from e-GP Implementations

Key benefits reported from the following selected e-GP implementations are summarized in the Table below:

- i. State Government of Andhra Pradesh (GoAP)
- ii. State Government of Karnataka (GoK)
- iii. State Government of Chhattisgarh (GoC)
- iv. DGS&D
- v. State Government of Orissa (GoO)

S no	Benefits reported from	e-GP Implementation				
5.110.	e-GP Implementations	GoAP	GoC	GoK	DGSND	GoO
1	Average bidder	Increased from 3 to		Increased from 1.58 to 7.01		Yes
	participation	4.5 bidders per tender		bidders per tender		
2	Tender premium	16% reduction in costs		Decreased from 21.02% to	Reduction	Reduction in costs
				5.46%	in costs	
3	Tender evaluation cycle	Reduced from 90 –		Reduced from 109.91 to 56.01	Yes	Yes
	time	135 days to 35 days		days		
4	Elimination of cartels	Yes		Yes	Yes	Yes
5	Better decision making &		Yes	Yes	Yes	Yes
	faster file movement					
6	Reduction in travel and	Reduction in	Voc	Yes Yes	Yes	Yes
	miscellaneous expenses	advertisement costs	163			
7	Anytime, anywhere	Yes	Yes	Yes	Yes	Yes
	access					
8	Standardization of	Yes	Yes	Yes	Yes	Yes
	procurement procedures					
9	Real-time access to	Yes		Yes	Yes	Yes
	status of tenders					
10	Enhanced transparency	Yes		Yes	Yes	Yes

Figure 15: Key benefits reported from e-GP implementations

16 Key Lessons

- a) <u>Implementation should be adequately large sized:</u> Setting up an full-fledged PKI enabled end to end e-GP system requires significant investments viz.:
 - Software development & software customization
 - Server side infrastructure deployed on high availability mode
 - Data Center set-up required for hosting the server infrastructure in a secured environment and Disaster Recovery set-up
 - Ensure availability of IT infrastructure and network connectivity to end users in their offices
 - Development of support infrastructure (i.e. system administration, help desk, training establishment and hand-holding set-up)
 - Project Management Unit (PMU)
 - Audit of e-GP system at regular intervals
 - Exit management plan

An installation should be adequately large sized and cater to at least tens of thousands of users. Only then, it will be worth-while to invest in the set-up required to sustain and professionally manage a full-fledged e-GP system. It will be too expensive to sustain small sized implementations and in the long run such installations run the risk of not being managed properly and getting abruptly discontinued. Such abrupt discontinuation would result in sunk costs, loss of data and cause problems in auditing the transactions.

- b) <u>Institutionalized decision making</u>: A number of key decisions will have to be taken in the course of implementing an e-GP system viz.:
 - Functional and geographical scope of e-GP
 - Business model
 - Vendor engagement strategy
 - Service Level Definitions
 - Go-live notifications and phased deployment
 - Standardization of procurement processes (on-going activity)
 - Process reengineering and procurement reforms
 - Review and approve security audit results
 - Crisis management
 - Provide administrative and technical sanction required to spend the funds allocated for implementation of e-GP system

Such decisions will have the desired effect when taken by an empowered committee of senior government officials. It is ideal when this committee gets its powers from legislation passed by Cabinet.

c) <u>Implementation to be taken up in project mode</u>: A project by definition has a start date, end date, specific goals, well defined roles and responsibilities and multiple parties involved. The implementation of e-GP taken up in a project mode makes the implementation a focused effort. Various stakeholders involved are required to complete activities as per certain well defined timelines. Any delays in implementation get monitored versus pre-set timelines and remedial actions are quickly taken to bring the project back on track. Implementation taken up in project mode provides clarity on the quantum of work yet to be completed. For example, an initiative to implement end to end e-GP platform is incomplete unless the post tendering components (i.e.

contract and catalogue management) of e-GP software are fully used by the government departments.

- d) <u>Phased deployment:</u> The shift towards e-GP system is sustainable when it is done in a gradual and phased manner. This phasing of e-GP deployment can be done across multiple dimensions:
 - Geography (induction of new departments)
 - Function (components of e-GP software)
 - Time (from a certain date)
 - Value (estimated value of tenders)

The various stakeholders get adequate time to adapt to the new way of functioning when the deployment is done in a phased manner.

- e) <u>Convince and buy-in users to adopt e-GP</u>: A Government department should get convinced about the benefits and agree to implement e-GP system. Any concerns raised by the department should be addressed upfront to their satisfaction. Subsequently, Government Order / Notification can be issued mandating the adoption of e-GP in the department. This procedure for on-boarding government departments would ensure sustained growth in adoption and usage of e-GP systems. The power to mandate adoption of e-GP in Government Order should be exercised with due care.
- f) <u>Change management:</u> Sustained efforts will have to be made to transition government users and contractors to use e-GP system. The following infrastructure should be well developed to enable implementation of change management activities:
 - Project Management Unit
 - Training establishment
 - Hand-holding support
 - Help desk

Workshops should be organized at regular intervals to get feedback from users to understand their concerns.

g) <u>Unified e-GP software</u>: One single instance of e-GP software should be evolved to address procurement requirements of multiple government departments. This software should be suitably modified and further parameterized to accommodate department specific requirements. All possible combinations in procurement workflows will gradually get built in as more and more government departments use this software as shared infrastructure.

17 The Way Forward

- a) <u>Implementation of Dhall Committee Recommendations</u>: The Dhall Committee has recommended implementation of sweeping reforms in the area of public procurement, listed in the chapter titled "e-GP Implementation Approach: A Historical View". The implementation of centralized e-Procurement platform recommended by the committee will provide a unified view of procurement opportunities in India and also enable generation of MIS on government procurement spend at the National level.
- b) <u>Functional Scope e-GP</u>: Few components included in an end-to-end e-GP system are getting implemented under different e-Governance initiatives. Certain Government departments have taken the initiative to implement integrated ERP system with some of the e-GP components in-built in the software: Indent Management and Contract Management. The recent Treasury related initiatives have sought to implement the pre and post tendering activities as an integral component of their solution. Some government departments have sought to implement systems to record status updates on their procurement activities for monitoring, evaluation and MIS generation⁵⁸. Policy level clarity is yet to emerge on the definition of e-GP system. In other words, functional scope covered in e-GP system has to be made clear. This definition should be effected such that other e-Governance initiatives are designed to integrate with e-GP systems in a standardized manner. Consistency in scope definition and system architecture has to be maintained across e-Governance implementations in order to integrate the many e-GP systems in a meaningful way. The "National database on supplier performance" detailed in the section "e-GP inter-operability requirements for National e-GP" will be difficult to develop when contractor performance information has to be retrieved from many different categories of e-Governance systems.
- c) <u>National e-GP Architecture</u>: The Department of Commerce has been assigned the responsibility to operationalize e-GP MMP and take measures to expedite adoption of e-GP across India. Certain deliberations have happened on the approach to be adopted to expedite implementation of e-GP across Government departments in India. The deployment of NIC's e-GP solution across Government departments on a SAAS (Software as a Service) model is being considered as one of the options. The existing e-GP systems implemented in PPP model would presumably continue to exist, etc. Such deliberations are focused on implementation modalities, wherein the concept clarity on National e-GP architecture is yet to emerge viz. :
 - What should be the unit of e-GP implementation (e.g.) can it be decided that there should be only one instance of e-GP software in a State Government / UT. In other words, how large is large enough
 - How many e-GP installations are required to address government procurement requirements of State Governments, Central Government Ministries and PSUs
 - How should the many e-GP systems inter-operate (refer to the section titled *"e-GP Inter-operability Requirements for National e-GP"* for details)?
 - National Repository for tenders
 - National Database of Registered Suppliers
 - National Database on Supplier's performance
 - What is the Vision for National e-GP MMP (i.e.) at what point can it be said that the objectives set forth for e-GP MMP has been achieved?

⁵⁸Refer: <u>http://www.teqip-pmss.com/Default.aspx</u>

d) <u>Unified Item Code Classification</u>: The need for unified item code classification is explained in detail in a section titled *"Implementation of Unified Item Code Classification"*. Refer to that section for details.

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19 Annexure A: List of Government Departments in the State Government of Tamil Nadu

- 1 Adi Dravidar and Tribal Welfare
- 2 Agriculture
- 3 Animal Husbandry, Dairying and Fisheries
- 4 BC, MBC a& Minorities Welfare
- 5 Co-operation, Food and Consumer Protection
- 6 Commercial Taxes and Registration
- 7 Energy
- 8 Environment and Forests
- 9 Finance
- 10 Handlooms, Handicrafts, Textiles and Khadi
- 11 Health and Family Welfare
- 12 Higher Education
- 13 Highways and Minor Ports
- 14 Home, Prohibition and Exercise
- 15 Housing and Urban Development
- 16 Industries
- 17 Information Technology
- 18 Labour and Employment
- 19 Law
- 20 Legislative Assembly
- 21 Municipal Administration and Water Supply
- 22 Personnel and Administrative Reforms
- 23 Planning, Development and Special Initiatives
- 24 Public
- 25 Public Works
- 26 Revenue
- 27 Rural Development and Panchayat Raj
- 28 School Education
- 29 Micro, Small and Medium Enterprises
- 30 Social Welfare and Nutritious Meal Programme
- 31 Tamil Development, Religious Endowments & Information
- 32 Tourism and Culture
- 33 Transport
- 34 Welfare of Differently Abled persons
- 35 Youth Welfare and Sports Department

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