SOFTWARE REQUIREMENTS SPECIFICATION

GEM PROJECT

VERSION 2.5

31-MAY-2018

Table of Contents

Record of Changes

Version No.	Change Reference No.	Author	Published Date	Description of changes	Approved By
1.0		Arvind Upadhyaya	11-Jan-2018	First Release	
2.0		Srinivasan & Sumit	22-02-2018	Section 4 changed	
2.3		Kaushal	13-03-2018	4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.1.7, 4.1.8, 4.1.9, 4.3, 4.4	
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2.5		Kaushal	04-04-2018	4.1.5, 4.3, 4.4.1 & 4.4.2, 4.4.1	
2.5		Srinivasan	04-04-2018	4.4.3	
2.5		Hemanta	06-04-2018	4.2.1,4.2.2 and 4.2.3	

1. Introduction

1. Purpose

The purpose of the document is to collect and analyze all requirements that have come up to define the system, its requirements with respect to consumers and all user journeys.

In short, the purpose of this SRS document is to provide a detailed overview of Gem software product, its parameters and goals. This document describes the project's target audience and its user interface, hardware and software requirements. It defines how Gem team and audience see the product and its functionality. Nonetheless, it helps any designer and developer to assist in understanding the GeM portal.

1.1 Intended Audience

Document is intended for developers, project managers, testers, documentation writers and of course for end users like HODs. This document will give complete requirement of the application. Rest of the document contains product scope, overall description of product, operational environment, constraints etc.

1.2 Product Scope

The software system being produced is called Government E-Market Place or GeM. It is being produced for a seller interested in selling product via the Internet. This system is designed to provide the products in all the Government departments with transparency. This system is largely cross-platform and is available to anyone from Government Department. The system will be run on a central server with each user having a remote user interface through a web browser to interact with it.

The Government E-Market Place will allow user to create an account to become Government buyer, Product Seller and Service Provider. The product should have following features included into it:

1. Registration of Buyer/Seller/HOD
2. Option to add Product and Services with specifications
3. Option to search the product or services as per requirement
4. Online Bidding and Reverse Auction
5. Price Comparison feature other than GeM portal (Pricedekho.com)
6. Option to Procure product less than 50,000 directly (Direct Purchase)
7. Access to different functions based on the Role and authorization
8. Option to include purchasing policy based on States and PSUs
9. Option to include services such as Child care, Digitization of records, Facility Management, Taxi Hiring
10. Gateways and Payment integration with States, Railways, Defense, Posts, and Different banks

1.3 References

1. RFP
2. Minutes of meetings
3. Existing SRS of GeM 2.0
4. Existing Gem Portal 2.0

2. An Overview

2.1 The Business Environment

GeM is an online Market Place portal which supports a number of functions for all he Government Departments, Public sector, Universities etc.

The Government E-Market Place will allow user to create an account to become a Government buyer, Product Seller and Service Provider.

GeM shall establish a one-stop online marketplace for Government buyers for their common use requirement of goods and services. Government e-Marketplace (GeM) is expected to bring greater transparency, efficiency and speed to such procurement. It will also provide ease of doing business and savings to Government through demand aggregation. Vendor and buyer registration is online through self-certification and 3rd party certification. Buyer can choose various means of purchasing ranging from direct purchase up to Rs 50,000/-, bidding or Reverse Auction.

2.2 The Business Objectives

The primary business objective of Gem is to make procurement hassle free and transparent across Govt organizations including following goals and benefits:

1. Provide all buyer-customers with a streamlined, seamless, highly generic buying process. By eliminating complicated/cumbersome/custom processes it minimizes the learning curve, cuts down transaction costs, and reduces the risks of disputes and litigation.

2. An E-Marketplace provides a complete 360° view of the entire buying process across all buyer-customers. This can help identify:

    a. Bottle necks in the overall buying process

    b. Identify potential fraud or corruption by tracking buyer/seller behavior.

    c. Knowledge gaps of buyers/sellers by monitoring their behavior on the platform and in turn provides necessary support to help overcome the difficulties.

    d. Solicit feedback from buyers and sellers on user experience and incorporate the same to improve overall site performance.

3. An E-Marketplace with a deep vendor rating system will be able to identify non performing sellers and educate, or if necessary, eliminate them from the system and hence improving buying efficiency.

Generic benefits include:

1. ***Scalability*** – Can dynamically adjust and meet demand easily, bypassing traditional sales channels and constantly expanding the supplier community.

2. ***Efficiency*** – By implementing an ‘integration layer’, eProcurement and other back-end business systems, E-Marketplace platforms drastically improve efficiency in Business-to-Government (“B2G”) commercial systems. Government buyers can order online at their convenience, GeM procurement teams can focus on quality control, enhancing the product base, enhancing the supplier base, and other value adding procurement functions. Double-entry of data in separate systems is eliminated, thereby reducing errors and improving shipping processes

and increasing order throughput, all the while maintaining the compliance and auditability framework of traditional procurement.

3. ***Transparency & Anti-corruption*** – Collusion, bid-rigging, bid-tampering are all present dangers in the procurement and sourcing world. Intelligent application of technologies, such as our partner Nextenders' patented Secure Bid Process, assist buyers in delivering confidence and driving transparency in government purchasing. By further integrating with existing authentication and validation databases and automating payments, the Government can provide its stakeholders (tax payers) with the confidence that it is achieving the Best Value Procurement. Implementing an integrated eMarketplace with automated ePayments, EMD refunds, bill passing payments, will further enhance the transparency, auditability and anti-corruption measures being taken by the Indian government, to the ultimate benefit of the Indian economy and society.

4. ***Choice & Competition*** – A with public sector catalogue pages provides powerful tools for government buyers to penetrate deeper into their supplier markets. As B2G suppliers move online to the GeM portal, GeM (or its replacement GeM SPV) can leverage the increased competition to find the best prices, quality, or the nearest distributors. For suppliers, it becomes far easier to leverage tools they already understand (such as indexing), Search Engine Optimisation ("SEO") etc. to develop internal markets within the portal, reducing their sales cycle lead times and improving their conversion rates.

5. **Socio-economic Benefits** – By reducing the cost of doing business with the supplier community, increasing its supplier base and stimulating competition between suppliers the government can expand its socio-economic activities. More suppliers, in more regions of India will benefit from doing business with government thereby achieving a key goal of government procurement / sourcing – redistribution of public funds from the centre to the periphery.

6. **Analytics** – B2G eCommerce is the perfect opportunity for GeM to launch a comprehensive analytics campaign. eCommerce will give GeM a detailed, strategic, understanding of government expenditure, materials usage, service needs, spend behaviour and inefficiencies. The scale of the proposed integrations will allow for a real-time picture to be established with intelligent reporting capabilities allowing buyers to understand where they, or the supplier community needs to improve.

7. **Buyer-focussed experience** – Global eCommerce platforms set the standard for providing an exceptional eCommerce experience and today's online shopper expect ease of use whether they are shopping for business or pleasure. To remain relevant, B2G organizations need to employ intuitive design, rich content, and interactive functionality in their websites – Government supplier communities should be no different.

2.3 Product Functions

The key users for Gem portal are Government buyers, suppliers, partners and third party agencies.

To enable these different organizations and users Gem provides following functions:

- Buyer registration / login / update – Govt buyers can register themselves and create their organization in GeM.
    - Market browsing by buyer – Market provides search for products, category based browsing that enables buyers and guest users to view the offerings in the market
    - Direct buy – Buyers can buy the desired products and services available in the market directly or can open the bid for the same
    - Bid buy – Buyers can open bid for procurement and sellers can participate in the bid process
    - RA buy – Reverse Auction can be opened by buyers and sellers can participate in the same

    - Receive products by consignee – Once the seller's ship the orders consignee can receive and inspect the quality of products.
- Seller registration / login / update – Sellers can come to Gem portal and register themselves. Optionally they can go for 3rd party vendor assessment. Sellers can also create their organization hierarchy
    - Bid response – Sellers can choose to respond to the bids created by buyer organizations
    - Order fulfillment, shipment – Once the bid is awarded to the sellers, they will need to ship the products and services
- Payment – GeM provides multiple payment options to facilitate buyers and sellers e.g. PFMS, SGPA, Net banking. It provides easy and transparent system for hassle free payments

- Contact support – Gem provides Inbound / outbound contact center for providing all kinds of support to the external and internal users of GeM System.

- CRM solution – Gem provides CRM solution for Contact Centre Operations

- BI & Analytics – Gem provides complete Business Intelligence tool using QLIK technology to audit the transactions

2.4 User Classes and Characteristics

Primarily users in Gem system can be bucketed in 5 classes i.e. Buyer, Seller, Partners, Third party and admin users.

Government buyers include:

- Buyer– this include users who will be purchasing through the GeM for their organizations
- Buyer HOD – this include users who create their individual departments and add buyers
- Consignee – this include users who receive the products once the order is placed
- Product administrators – this include set of users who manage the catalogue of standard products
- PAO – payment authority include set of users who manage budget and release the payment for orders

Sellers include:

- Product sellers – this include set of users who register themselves in GeM portal to offer the products
- Services suppliers - this include set of users who register themselves in GeM portal to offer their services
- Primary sellers – primary sellers are the owners who create their seller organizations and add secondary sellers
- Secondary sellers– these are added by primary sellers to perform various functions like shipment etc.

The Partners include:

- Banks– partner banks
- Payment gateways – online net banking
- PFMS – Payment system
- SGPA – State Gem Pool Account
- UIDAI – Aadhaar database
- NSDL – ASA to integrate to UIDAI
- MCA etc.

Third party agencies include:

- Credit rating agencies – Agency do credit ratings for vendors
- Inspection agencies – Quality and inspection can be done by consignees themselves or they can outsource the work to 3rd party inspection agency

2.5 Operating Environment

The GeM core platform follows Service Oriented (Micro-service) Architecture and exposes the internals of all of its services via an API Layer. For all service communication, both internal and external, the only gateway to the service is its API. The API Layer allows for a modular architecture of the services providing horizontal scalability as the service load demands. The API Layer centralizes and unifies functionality in one place so it is easy to add, remove and reconfigure services in a uniform way. The APIs will be Restful, JSON, and/or XML. Endpoints will be shielded from direct interaction with the internet. Full technology stack for Gem is provided in Table 1:

Table 1 : Technology stack in Gem

Purpose	**Technology**
Virtual machine	Ubuntu, RHEL, Windows
Web server	Apache, JBOSS
Database server	MySQL
Scripting language	PHP, Java, Ruby on Rails
PHP Framework	CodeIgniter
Application Sever	JBOSS
Application Development Framework	JSP, Spring & Hibernate
Business rules Engine	Drools
Single Sign On	ARX SSO
Email GW	NIC Email
SMS Gateway	NIC SMS Gateway
Payment Gateway	SBI Gateway, PFMS, SGPA
Search Engine	Apache SOLR
Reporting & BI	QLIK
Application Load balancer	Apache reverse proxy, HA proxy
Memcache	Session caching Server
Jenkins	Continuous Integration
Docker	Container based deployment
GWT	Google Web Toolkit
Market place scripting	Ruby on Rails
GIT	Source code management

2.6 Design and Implementation Constraints

Gem has following constraints:

- Use of Free and Open source software is encouraged. Any licensed software use is discouraged
- GCC cloud is to be used for deployment of software
- Use of openforge is recommended for SCM

2.7 User Documentation

Along with the working software documents like user manual, online tutorials, training videos are to be provided. Following list contains the list of documents which will be required[at the time of writing this document]:

- Technology & Architecture

- Cloud solution and provision
- Release management
- BRD
- FRS
- SRS
- HLD & LLD
- Process flow documents
- Test cases and Test plan

2.8 Hardware & Software Environment

Not Applicable.

2.9 Assumptions and Dependencies

We have assumed that the GeM Product is in proper working condition and that the user is capable of operating these system's basic functions including but not limited to being able to power on the system, login and open either Internet Explorer or Mozilla Firefox, and navigate the browser to the address of this GeM website.

We assumed that the GeM will be running on a properly working web server and database system with an Internet connection that allows this system to perform all communications with clients.

Full documentation for existing Gem system will be provided by Gem SPV.

3. External Interface Requirements

3.1 User Interfaces

A first-time user of the application can browse the market for products. When user wants to perform an action e.g. buy an item or registration, he is redirected to log-in page or registration page.

Overall user interfaces can be divided into:

a) Pre Login flow: In these interfaces user can browse the market, search the product, read the faq, check announcements etc.

b) Login flow: In these interfaces user can login into Gem portal and based upon his role he will be redirected to buyer section, seller section and admin section

c) Registration flow: A user in Gem can register as Buyer or Seller

d) Buying flow: Govt. buyer can initiate the buying flow and can make purchase for his / her respective department

e) Bid flow: There is a separate bid flow for buyer and seller

f) RA flow: There is a separate Reverse Auction flow for buyer and seller

Based on Role of user different privileges are assigned. There is common user interface for every user and based on his role he can perform different actions like adding product, participate in bidding, place order, accepts goods, payment processing etc.

3.2 Hardware Interfaces

End user with computer and / or smart device i.e. mobile, tablet with internet connection can access GeM. It is Web based portal.

3.3 Software Interfaces

There is multiple software layers involved in design of Gem portal. The full portal is made up of external software interfaces as well as internal software interfaces among sub-portals.
Please refer Figure 1 for full architecture of software interfaces.

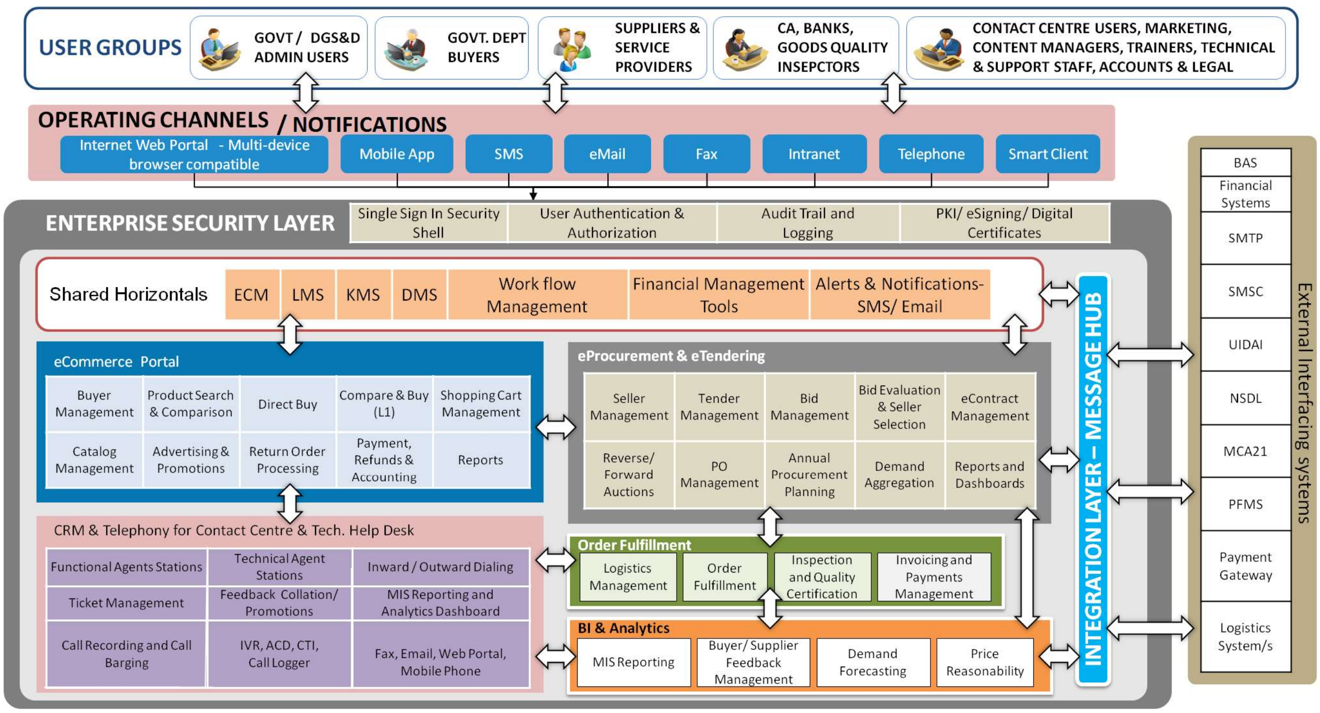


Figure 1: Software interfaces

Internal software interfaces:

a) Internal communication is designed to happen via micro services. Each sub-portal e.g. market and fulfillment pass important data by the mode of micro services. Each micro service is independent of each other.
b) Single sign on – ARX – User management at backend is maintained at central location and every sub-portal uses the same SSO to login in their respective application
c) Common services to send Email and SMS

External software interfaces:

External communication is designed to happen via central message hub integrator. All the 3rd party integrations go via a central hub to keep the interaction secure and uniform. Following list shows some of external interfaces:

a) E-sign
b) Aadhaar
c) PAN
d) MCA
e) SMS & Email
f) PFMS

g) SGPA
h) Price Dekho etc.

3.4 Communications Interfaces

In Gem primary communication is designed to be over http portal. Following methods are also designed wherever appropriate:

a) SMS – order creation, promotion, order notifications, Payment notification
b) Email - order creation, promotion, order notifications
c) http – Portal access, mobile web site
d) IVR – Contact center

4. System Features

In Gem, major system features are buyer registration, seller registration, SSO login, buying flow, order fulfillment, payment flow. Each system is described in detail below.

4.1 Buyer Registration

In Gem Buyer on boarding and buyer management should be decentralized. This enables to onboard & manages huge numbers of Buyers to GeM over time.

4.1.1Functional Requirements

Buyer registration should cover all the following requirements:

REQ 1: Hierarchal
Buyer registration and buyer management should be Hierarchal. It should reflect both real world hierarchies of Organizations as well as designations within an organization

REQ 2: Part of multiple organizations
Buyer registration and buyer management should allow user to be part of multiple organizations and also Playing multiple roles simultaneously

REQ 3: Different Roles
Buyer registration and buyer management should support the concept of Role and should be able to apply Business rules restrictions on Roles

REQ 4: Personnel Movement
Buyer registration and buyer management should support movement of personnel across departments / Organizations or outside GeM

4.1.2 Business Rules for buyer registration

Buyer registration in Gem requires certain business rules that are pre-requisite for registration process. Following List mentions the rules:

BR 1: Buyer should have Aadhaar number
BR 2: Aadhaar number should be verified with UIDAI DB via 3rd party API
BR 3: Upon successful validation of Aadhaar, BRBM will fetch the name, and mobile phone (ifavailable) from Aadhaar. These values will overwrite any values previously configured by the user.
BR 4: System supports configuration of periodically ask Primary user to verify his Aadhaar. This is to ensure that the user occupying the Primary user post. Currently number of days for configuration is not set.
Post is still the user configured in the system. This validation will avoid cases such as (a) HOD user left the system without making changes in the system for his exit. Some other user joins as HOD and is using the credentials of the previous HOD user. (b) HOD user's login is being used by a delegated user.

4.1.3 Basic Concept

User, Post, Role

'User' uniquely identifies a person in GeM system e.g. individual named Ram Sariram

Post identifies a designation within an organization e.g. Assistant Engineer

Role identifies different functions that users can do in GeM system e.g. Buyer, Consignee, and Approver etc.

1. At any point of time only one user id can occupy a Post. One User (AADHAR) can occupy multiple posts across multiple organizations using different user id and email id.

2. A Post can have one or more Roles associated with it. Allowed combination of Roles is subject to business rule restrictions defined for GeM e.g. Buyer and Approver cannot be the same user.
3. User gets to play a Role in GeM by virtue of user's association to a Post and Post's association to a set or Roles. For instance, Ram Sarin gets to be the Buyer in GeM because he occupies a post Assistant Engineer and this post has Buyer Role associated with it.

4.1.3 Buyer HOD registration

Following table provides steps for buyer HOD registration:

Use Case Name – Registration as HOD	
Description	Process for new Primary user registration as Government Buyer HOD
Actor	Government Servant/Secretary/Joint Secretary
Preconditions	User has email id ending with nic.in or gov.in
Basic Flow	1. Go to gem.gov.in 2. Click on Sign up 3. Select 'Buyer' 4. Enter your AADHAR Number & Mobile Number Linked with AADHAR ➢ Incorrect AADHAR / Mobile Number : System displays "We apologize, your Aadhar and / mobile number verification was unsuccessful, please try again ➢ Correct AADHAR / Mobile Number: User to enter OTP received on Aadhar linked mobile number and click on verify.YourAadhaar and mobile number verification was successful. Please check your name as provided under Aadhaar. In case you want to rectify any of the information, you are required to get the same done with Aadhaar. 5. Select Organization Type, Ministry/Department and Organization/Division, Enter Office Zone 6. Primary user has to enter his/her official mail id ending with gov.in or nic.in and Verify email id for verification purpose, OTP will be sent to his/her mail id, Post OTP verification system will allow to create user name and password. In case of non gov.in / nic.in email id, system will not allow user to proceed. Email id & User id needs to be unique. System does not allow the user to register using same email id if email id is already registered. 7. Verify email ID using OTP 8. Enter User ID 9. Enter password 10. Primary user has toreconfirm password and accept terms & condition of Government e-Marketplace (GeM) to create Account by clicking on Terms & Condition. 11. Accept Terms and Conditions and click on Create Account

Post Condition	A confirmation message will display and email will get triggered to Primary User(HOD) and user gets redirect to the Organization address screen

4.1.4 Primary User registration Process completion

Following table provides steps for Primary User registration process completion:

Use Case Name - *Primary User registration Process completion*	
Description:	Primary User(HOD - Profile Completion & Four Different Payment Methods
Actor	Government Servant/HOD
Preconditions	HOD registered and redirected to Organization address screen

Use Case Name - ***Primary User registration Process completion***	
Description:	Primary User(HOD - Profile Completion & Four Different Payment Methods

Basic Flow

1. User is on Organization Address screen
2. Enter Pin code, State and district gets populated
3. Enter Address, Contact Number and website URL
4. Click on Save
5. Primary user can select single Payment Method based on Organization Type

Payment Method/HoD Organization Type	**Central Ministries**	**State Govt.**	**Ministry of Defence**	**Ministry of Railways**	**ONGC**	**Organization - CRPF**	**Department of Posts**	**Others**
PFMS	Y							
Internet Banking		Y	Y	Y	Y	Y	Y	Y
Gem Pool Account (GPA)		Y						
CGDA			Y					
Railways				Y				
ONGC/ERP					Y			
CRPF						Y		
Post							Y	
State		Y						
Others	Y							Y

6. In case of Internet banking payment method, user needs to enter IFSC code and bank name, branch name and address get auto populated. User needs to add account number and re confirm the account number else user can select the other payment method.
7. Enter Personal information (GSTIN), First name, last name and designation gets auto populated
8. Enter Referral verification details. Verifying authority to get the email notification to reject the primary user account within 48 hours.
9. kPrimary user can change the password using AADHAAR Verification and OTP
10. Primary user change email id and mobile number using OTP verification
11. Primary user can deactivate his or her account and can invite new takeover primary user by entering email id of invited primary user
12. Taking over primary user can verify AADHAAR and can update the profile
13. Primary user can play a role of primary user in multiple organization with Unique email Ids

Use Case Name - *Primary User registration Process completion*	
Description:	Primary User(HOD - Profile Completion & Four Different Payment Methods
Post Condition	Message will be shown to the user after successful registration and now user is able to add secondary user (Buyer, Consignee, PAO/DDO)

4.1.5 Buyer / consignee / Payment Authority (DDO / PAO) Registration by Primary user (HOD)

Primary user (HOD) can add secondary user. Primary usercan create new division or add secondary user in existing division

1. Primary user to click on create new division
2. Primary user to enter division name, division address and division details
3. Primary user to click on “Save” and create division

Manage Division

Manage division functionality caters to modify / edit division details like name, change pin code and street address

1. Primary user to click on manage division
2. Primary user to get list of divisions created
3. Primary user to click on edit division for editing division name, change pin code and street address
4. Primary user can deactivate a division subject all posts of are vacant in that division. Primary user to delink user from post w.r.t to any division before deactivating a division.

Following table provides step by step registration

Use Case Name - Buyer / consignee / Buyer consignee both Registration by HOD	
Description:	Primary user adding secondary users into the organization
Actor	Government Servant- HoD
Precondition	Secondary User can use private email id also
	1. Go to gem.gov.in->Login as HoD 2. Go to My Account ->My Team 3. Primary user to go to manage post screen 4. Enter Designation name, select division and Select Roles Role matrix Multiple roles are allowed to one user within same office /zone as per following condition. **Role**

Use Case Name - Buyer / consignee / Buyer consignee both Registration by HOD

Matrix					
USER1 / ORG1	**HOD**	**Buyer**	**Consignee**	**DDO**	**COMMENTS / ASSUMPTIONS**
HOD	YES	NO	YES	NO	**HOD cannot be buyer or DDO / PAO in ORG1. HOD Can be consignee in ORG1**
Buyer	NO	YES	YES	NO	**Buyer can be consignee but cannot be DDO / PAO**
Consignee	NO	YES	YES	NO	**Consignee can be Buyer. Consignee cannot be DDO / PAO in ORG1**
Consignee	NO	NO	YES	NO	**HOD can be consignee. Consignee user is added by HOD.**
DDO / PAO	NO	NO	NO	YES	**DDO cannot be HOD, Buyer and Consignee**
USER1 / ORG2	**HOD**	**Buyer**	**Consignee**	**DDO**	**COMMENTS / ASSUMPTIONS**
HOD	YES	YES	YES	YES	**HOD ORG1 Can be Buyer OR HOD OR Consignee OR DDO/ PAO OR HOD + CONSIGNEE in ORG2 OR.**
Buyer	YES	YES	YES	YES	**BUYER ORG1 Can be Buyer OR HOD OR Consignee OR DDO/ PAO OR BUYER + CONSIGNEE in ORG2 OR.**
Consignee	YES	YES	YES	YES	**CONSIGNEE ORG1 Can be Buyer OR HOD OR Consignee OR DDO/ PAO OR BUYER + CONSIGNEE OR CONSIGNEE + HOD in ORG2.**
DDO	YES	YES	YES	YES	**DDO ORG1 Can be Buyer OR HOD OR Consignee OR DDO/ PAO in ORG2.**

5. Enter user id and official email id
6. Email id & User id needs to be unique for every post

Post is basically a designation occupied by the user. One user id is attached to single post. One AADHAR can have multiple posts. Eg. Mr. A consignee with Aadhaar number (123) can occupy consignee post1 (ORG1) with consignee1 as user id same way Mr. A can occupy consignee post2 in (ORG2) with consignee2 as user id.

7. Enter official email id (Mandatory) & invite email id (Optional) of secondary user:
8. Lot of secondary users do not have official email id ending with gembuyer.in, gov.in or nic.in. It was main blocker to invite secondary user. The concept of invite email id was introduced to send invites to private email id of secondary user. The secondary user in parallel applies for official email id.
9. Click on “Add user”
10. The activation email link will be sent to secondary user
11. Secondary user clicks on activation link
  a. Secondary user to verify AADHAAR using OTP
  b. Secondary user to set password
  c. Secondary user to update personal profile
12. Primary user can remove the post and assign the vacant post to any other secondary user in case of transfer of secondary user
13. Secondary user clicks on activation link

Use Case Name - Buyer / consignee / Buyer consignee both Registration by HOD	
Post Condition	Invitation e-mail will be sent to Secondary user account to occupy that post. On clicking the invitation link will be taken to GeM portal, Aadhaar verification page.

4.1.6 Transfer of Primary User

Primary user can transfer in following manner:

1. Primary user can click on deactivate account and provide email id of new taking over HOD.
2. Primary user shares user id and password with new taking over HoD. New HoD can login using user name and password and update AADHAR using "Not Me" functionality

Following table provides step by step registration

Use Case Name – Transfer of Primary User (HOD)	
Description:	Primary user Transfer
Actor	Government Servant- HoD
Preconditions	Login as HOD
Basic Flow	Primary user can click on deactivate account and provide email id of new taking over HOD 1. Go to gem.gov.in->Login as HoD 2. Go to My Account 3. Primary user to click on deactivation link 4. Enterthe email id of new taking over HoD 5. Taking over HoD receives an email notification 6. Taking over HoD to click on link and verify AADHAAR 7. Taking over HoD update the profile and start adding secondary user Primary user shares user id and password with new taking over HoD. New HoD can login using user name and password and update AADHAAR using "Not Me" functionality 1. Go to gem.gov.in->Login as Primary user using user name and password by old primary user 2. Go to My Account 3. Click on "Not Me" 4. Update AADHAAR number and verify AADHAAR gets successfully updated

4.1.7 Re-verify AADHAR of Primary User (Functionality disabled as per business decision)

This functionality is to ensure that primary user account is active and verified by primary user from time to time to avoid unauthorized access.

4.1.8 De-activation/Transfer of Secondary user

Primary user can deactivate secondary user.
Following table provides step by step registration

Use Case Name – Transfer of Secondary User	
Description:	Secondary user Transfer – Deactivation
Actor	Government Servant- HoD
Preconditions	Login as HOD
Basic Flow	Primary user can deactivate secondary user post and secondary user 1. Go to gem.gov.in->Login as HoD 2. Go to My Account-> My Team 3. Go to Post Management 4. Click on Deactivate / Transfer 5. Secondary user gets deactivated 6. Primary user can invite another secondary user on that post without changing post bases official email id. GeM is moving towards post base email ids.

4.1.9 Email matrix

Sr.No	Email Type	Recipient
1	Organization sign up - Primary user	Primary user (HoD)
2	Verify email Id with OTP	Primary user (HoD)
3	Primary user Profile complete successfully registration - Primary user	Primary user
5	Adding new secondary user by Primary user	Secondary user
6	Primary User deactivation and inviting new taking over Primary user	Old Primary user as well as New primary user

4.2 Seller Registration

Seller registration in Gem involves multiple verifications. All Sellers intending to do business with Government e-Marketplace have to register themselves with the portal either as a Product Seller or as a Service Provider. A Seller can register his/her Company/Firm/Business unit with GeM as per the defined business rules and requirements. Sellers can be either registered as Primary User or as a Secondary User. Primary user is the authorized person who registers the Company/Firm/Business unit and enjoys full Seller privilege to work on the GeM system. Once registered, the primary user can add the secondary users and assigned them specific roles. Realtime validation of Seller information with Government legacy systems will be done. Only those Sellers whose information is validated with the legacy systems will be allowed to complete the registration with GeM.

4.2.1 Seller Registration as Primary User

Primary user is the authorized person who registers the Company/Firm/Business unit and enjoys full Seller privilege to work on the GeM system.

Use case – Seller Registration	
Description	**New Seller Registration**
Pre-condition	**Seller should have Aadhaar linked with his mobile no.** **For Proprietorship, the owner of the business should do registration using his/her own Aadhar number and PAN** **For Companies. Firms and Trust/Societies, person registering the Company/Firm/Trust/Society in GeM should be a Key-Person of the organization according to the last ITR records. Aadhar of the Key-person should be used for registration.**
Steps	Step 1: Open Gem.gov.in in the browser. Step 2: Go to Sign up menu >> Click on Seller You will be redirected to the Seller Sign Up Page Step 3: Enter the Aadhaar Number of the Authorized User of organization who is creating User account on the System. Followed by the mobile number linked with the AADHAAR. Step 4: If Aadhaar Number details provided by the user are not in order, User will be redirected to same screen to enter Aadhaar Number, and if the user has entered proper details he will get the OTP in his AADHAAR linked mobile number. Step 5: Enter OTP sent by UIDAI system to get the AADHAAR number verified. If OTP sent to User is not verified, User will be redirected to same screen again to enter the Aadhaar Number. Upon successful verification, the user will get a message “Your Aadhaar and mobile number verification was successful. Please check your name as provided under Aadhaar. In case you want to rectify any of the information, you are required to get the same done with Aadhaar.” Then the user will be redirected to the subsequent step of User Creation process. If OTP sent to User is verified, following details of User will be sent to GeM First Name, Middle Name and Last Name whatever is available in aadhar. Step 6: In the next step of user creation process, a form will be there with some of the fields pre filled from the UIDAI system. Such as: Aadhaar Number, Mobile number linked with Aadhaar, First Name, Middle Name & Last name. The user need to fill the other details. Such as: the Email ID, Verify the Email ID, Enter the OTP sent to the email ID, Constitution type. Also the user need to set the User ID and Password here in this section. Step 7: In the constitution dropdown, Select the constitution of organization for which User

	initiates registration process and enter details as required Proprietorship As a proprietor user have to mandatorily give his name as per PAN and his/her related PAN and it will verify these details with PAN services. Company User has to mandatorily enter the CIN of the Company. System will verify the CIN with MCA21 and on successful verification of the CIN, the Date of Incorporation of the Company will get fetched. After CIN verification system will ask for Name of the Key Person as per ITR records and his/her Company PAN and it will verify these details with PAN services. As a company system will ask his/her ITR type, Acknowledgement number, assessment year, designation, Company Name and CIN. Firm As a Firm system will ask his/her ITR type, acknowledgement number, assessment year, designation, Name of Key Person as per ITR records and his/her Firm PAN and it will verify these details with PAN services. Trust or Society As a Trust/Society user have to mandatorily give his name as per PAN and his/her related PAN and it will verify these details with PAN services. Step 8: After successful verification from PAN, the system will match the name as per PAN/ITR records and aadhar holder entered in the first step. The 33% matching of name is mandatory. If information provided by User is not validated, User will be required to redirect to provide information. After verification on the entire services (MCA21 and PAN) user will be allowed to create his user id and password. Step 9: User will be expected to insert – User ID, password , Registered as (Product Seller / Service Provider / Both). Step 10: Before creating the account, user have to mandatorily read the terms and conditions and close the button. Step 11: After reading Terms & Conditions, user can click Create Account button to create user account. At this point registration system will pass entire information of the account to the ARX system. Basis successful population of information in the ARX system, user account will get created and user will be shown a success message on the screen. In case of failure in saving information in the ARX system, user will be shown error message. Step 12: User account gets created. After creation of the account the user can login and update the further details under the “View Profile” section. Step 1: Open Gem.gov.in in the browser. Step 2: Go to Sign up menu >> Click on Seller You will be redirected to the Seller Sign Up Page

	Step 3: Enter the Aadhaar Number of the Authorized User of organization who is creating User account on the System. Followed by the mobile number linked with the AADHAAR. Step 4: If Aadhaar Number details provided by the user are not in order, User will be redirected to same screen to enter Aadhaar Number, and if the user has entered proper details he will get the OTP in his AADHAAR linked mobile number. Step 5: Enter OTP sent by UIDAI system to get the AADHAAR number verified. If OTP sent to User is not verified, User will be redirected to same screen again to enter the Aadhaar Number. Upon successful verification, the user will get a message “Your Aadhaar and mobile number verification was successful. Please check your name as provided under Aadhaar. In case you want to rectify any of the information, you are required to get the same done with Aadhaar.” Then the user will be redirected to the subsequent step of User Creation process. If OTP sent to User is verified, following details of User will be sent to GeM First Name, Middle Name, Last Name whatever is available in aadhar. Step 6: In the next step of user creation process, a form will be there with some of the fields pre filled from the UIDAI system. Such as: Aadhaar Number, Mobile number linked with Aadhaar, First Name, Middle Name & Last name. The user need to fill the other details. Such as: the Email ID, Verify the Email ID, Enter the OTP sent to the email ID, Constitution type. Also the user need to set the User ID and Password here in this section. Step 7: In the constitution dropdown, Select the constitution of organization for which User initiates registration process and enter details as required **Proprietorship** **As a proprietor user have to mandatorily give his name as per PAN and his/her related PAN and it will verify these details with PAN services.** **Company** **User has to mandatorily enter the CIN of the Company. System will verify the CIN with MCA21 and on successful verification of the CIN, the Date of Incorporation of the Company will get fetched.** **After CIN verification system will ask for Name of the Key Person as per ITR records and his/her Company PAN and it will verify these details with PAN services.** **As a company system will ask his/her ITR type, Acknowledgement number, assessment year, designation, Company Name and CIN.** **Firm** **As a Firm system will ask his/her ITR type, acknowledgement number, assessment year, designation, Name of Key Person as per ITR records and his/her Firm PAN and it will verify these details with PAN services.** **Trust or Society**

As a Trust/Society user have to mandatorily give his name as per PAN and his/her related PAN and it will verify these details with PAN services.

Step 8: After successful verification from PAN, the system will match the name as per PAN/ITR records and aadhar holder entered in the first step. The 33% matching of name is mandatory.
If information provided by User is not validated, User will be required to redirect to provide information.

After verification on the entire services (MCA21 and PAN) user will be allowed to create his user id and password.

Step 9: User will be expected to insert – User ID, password (twice for confirmation), , Registered as (Product Seller / Service Provider / Both).

Step 10: Before creating the account, user have to mandatorily read the terms and conditions and close the button.

Step 11: After reading Terms & Conditions, user can click Create Account button to create user account. At this point registration system will pass entire information of the account to the ARX system. Basis successful population of information in the ARX system, user account will get created and user will be shown a success message on the screen. In case of failure in saving information in the ARX system, user will be shown error message.

Step 12: User account gets created.

After creation of the account the user can login and update the further details under the "View Profile" section.

Updating profile : Proprietorship User - Registration

There will be separate tabs displayed for different constitution type. When a proprietorship user login to the system the following tabs will be populated. Such as: Seller Profile, Registered As, Company Details, PAN Validation, Office Location, Startup, MSME?, Experience, Bank Accounts, My Team.

Seller Profile:
There will be some fields in this section such as First Name, Last Name, Mobile Number & email ID. All of these fields will be displayed pre filled by fetching the data from UIDAI system.

Registered As:
There will be a list of options in this section which can be selected by the user as per the requirement. The options are OEM, Reseller, OEM Service Provider, Non OEM Service Provider, Service Provider. By clicking on the desired checkbox, the user can click on the save button.

	Company Details: In the Company details tab, the user will have to mention the Company/ Firm/ Business Unit Name & the Date of Incorporation as it is mentioned in the "Certification of Incorporation". **PAN validation:** In the PAN validation section, the user will have to enter the PAN number and the name as mentioned in the PAN. In case of "Proprietorship" type of business, the user will have to enter his personal PAN number. After filling the desired details, the user will have to click on the "Verify PAN" button. **Office Locations:** In the Office Location section, the address details can be updated by filling up the desired details. All the entered address details will be displayed in a gridview. There seller can enter multiple address under this section. The following details will be required to be entered for updating the address. • Office name • Type of Office - This can be selected from the dropdown. And the type of office can be selected as Registered/ Billing/ Manufacturing/ Service Center/ Godown. • PIN Code • State • Town/City/District • Flat/Door/Block No. • Name of Premises/ Building/ Village • Road/ Street/ Post Office • Area/ Locality • Mobile Number • Email ID • GSTIN By filling the details in this form the user can click on the Save button. Upon clicking on the Save button, the details will be saved in the database and will be displayed in a grid view in the same page. **Startup:** Under this tab, the user can select yes by clicking on the check box, if it is registered with Startup India. When the user will click on the checkbox, two more fields will be displayed to enter the "DIPP number" & the "DIPP linked Mobile number" **MSME:** Under this tab, the user can select yes by clicking on the check box, if it is registered with MSME. When the user will click on the checkbox, two more fields will be displayed to enter the "UAM number" & the "UAM Aadhaar/Mobile number" **Experience:** Under this Experience tab the user will have to enter the details such as Total Experience (in years), Total Experience with Govt (in years), Total number of Orders & view of Total number of Orders. **Bank Accounts:** Bank Account Details is one of the important section for the seller to receive the payment. In the section, the details, such as : IFSC Code, Bank name, Bank Address, Bank account Number(2 times for confirmation) & Account Holder name can be updated by the user. Multiple accounts can be entered in this section. The user can select the primary account by

checking on the check box in the same page. By clicking on the save button, the details will be saved in the database and it will be displayed in grid view in the same page.

Once a account is selected as a primary cannot be changed. To change the primary account, the user will have to contact to the service desk.

My Team:

Under this section, the total number of registered user details will be displayed. Also a user can add a secondary user by sending him/her a invitation in this section. There is a button "Add Secondary user." By clicking on the "Add Secondary user", the email id of the user can be entered. Also the role can be assigned to the invited user. Multiple roles can also be assigned to the user by clicking on the Select Roles tab. The roles are "Can Create Bid", "Can Create Catalog", "Can manage order Fulfillment".

By entering the desired details, "Add User" button can be clicked. Upon clicking on the "Add User" an invitation link will be delivered to the invitees email id.

And in the email id, there will be a link "Verify me now". By clicking on the "Verify me Now" button, the user can follow the same registration process to get registered in the Gem website as explained above.

Also there will be two separate tab "Key Person" & "Tax assessment" which will be displayed only to the old & existing users who are paying tax. For new users, the tab will be in disable mode and will not be displayed.

Updating profile : Company User - Registration

There will be separate tabs displayed for different constitution type. When a company user login to the system the following tabs will be populated. Such as: Seller Profile, Registered As, CIN Validation, PAN Validation, Office Location, Startup, MSME?, Experience, Bank Accounts, My Team.

Seller Profile:

There will be some fields in this section such as First Name, Last Name, Mobile Number & email ID. All of these fields will be displayed pre filled by fetching the data from UIDAI system.

Registered As:

There will be a list of options in this section which can be selected by the user as per the requirement. The options are OEM, Reseller, OEM Service Provider, Non OEM Service Provider and Service Provider. By clicking on the desired checkbox, the user can click on the save button.

CIN Validation:

In the CIN Validation tab, the user will have to mention the CIN as mentioned in the certification of incorporation. Company/ Firm/ Business Unit Name & the Date of Incorporation will be prefilled from other tab.

After entering the CIN number, the user can click on the "Verify CIN" button to get the details verified.

PAN validation:

In the PAN validation section, the user will have to enter the PAN number and the name as mentioned in the PAN. In case of "Company" type of business, the user will have to enter the company PAN number. After filling the desired details, the user will have to click on the "Verify PAN" button.

Office Locations:

In the Office Location section, the address details can be updated by filling up the desired details. All the entered address details will be displayed in a gridview. There seller can enter multiple address under this section.

The following details will be required to be entered for updating the address.

- Office name
- Type of Office - This can be selected from the dropdown. And the type of office can be selected as Registered/ Billing/ Manufacturing/ Service Center/ Godown.
- PIN Code
- State
- Town/City/District
- Flat/Door/Block No.
- Name of Premises/ Building/ Village
- Road/ Street/ Post Office
- Area/ Locality
- Mobile Number
- Email ID
- GSTIN

By filling the details in this form the user can click on the Save button. Upon clicking on the Save button, the details will be saved in the database and will be displayed in a grid view in the same page.

Startup:

Under this tab, the user can select yes by clicking on the check box, if it is registered with Startup India. When the user will click on the checkbox, two more fields will be displayed to enter the "DIPP number" & the "DIPP linked Mobile number"

MSME:

Under this tab, the user can select yes by clicking on the check box, if it is registered with MSME. When the user will click on the checkbox, two more fields will be displayed to enter the "UAM number" & the "UAM Aadhaar/Mobile number"

Experience:

Under this Experience tab the user will have to enter the details such as Total Experience (in years), Total Experience with Govt (in years), Total number of Orders & view of Total number of Orders.

Bank Accounts:

Bank Account Details is one of the important sections for the seller to receive the payment. In the section, the details, such as : IFSC Code, Bank name, Bank Address, Bank account Number(2 times for confirmation) & Account Holder name can be updated by the user. Multiple accounts can be entered in this section. The user can select the primary account by checking on the check box in the same page. By clicking on the save button, the details will be saved in the database and it will be displayed in grid view in the same page.

Once a account is selected as a primary cannot be changed. To change the primary account, the user will have to contact to the service desk.

My Team:

Under this section, the total number of registered user details will be displayed. Also a user can add a secondary user by sending him/her a invitation in this section. There is a button "Add Secondary user." By clicking on the "Add Secondary user", the email id of the user can be entered. Also the role can be assigned to the invited user. Multiple roles can also be assigned to the user by clicking on the Select Roles tab. The roles are "Can Create Bid", "Can Create Catalog", "Can manage order Fulfillment".

By entering the desired details, "Add User" button can be clicked. Upon clicking on the "Add User" an invitation link will be delivered to the invitees email id.

And in the email id, there will be a link "Verify me now". By clicking on the "Verify me Now" button, the user can follow the same registration process to get registered in the Gem website.

Updating profile : Firm User - Registration

There will be separate tabs displayed for different constitution type. When a Firm user login to the system the following tabs will be populated. Such as: Seller Profile, Registered As, Company Details, PAN Validation, Office Location, Startup, MSME, Experience, Bank Accounts, My Team.

Seller Profile:
There will be some fields in this section such as First Name, Last Name, Mobile Number & email ID. All of these fields will be displayed pre filled by fetching the data from UIDAI system.

Registered As:
There will be a list of options in this section which can be selected by the user as per the requirement. The options are OEM, Reseller, OEM Service Provider, Non OEM Service Provider, Service Provider. By clicking on the desired checkbox, the user can click on the save button.

Company Details:
In the Company details tab, the user will have to mention the Company/ Firm/ Business Unit Name & the Date of Incorporation as it is mentioned in the "Certification of Incorporation".

PAN validation:
In the PAN validation section, the user will have to enter the PAN number and the name as mentioned in the PAN. In case of "Company" type of business, the user will have to enter the company PAN number. After filling the desired details, the user will have to click on the

"Verify PAN" button.

- Office Locations:
  In the Office Location section, the address details can be updated by filling up the desired details. All the entered address details will be displayed in a gridview. There seller can enter multiple address under this section.

The following details will be required to be entered for updating the address.

- Office name
- Type of Office - This can be selected from the dropdown. And the type of office can be selected as Registered/ Billing/ Manufacturing/ Service Center/ Godown.
- PIN Code
- State
- Town/City/District
- Flat/Door/Block No.
- Name of Premises/ Building/ Village
- Road/ Street/ Post Office
- Area/ Locality
- Mobile Number
- Email ID
- GSTIN
  By filling the details in this form the user can click on the Save button. Upon clicking on the Save button, the details will be saved in the database and will be displayed in a grid view in the same page.

Startup:
Under this tab, the user can select yes by clicking on the check box, if it is registered with Startup India. When the user will click on the checkbox, two more fields will be displayed to enter the "DIPP number" & the "DIPP linked Mobile number"

MSME? :
Under this tab, the user can select yes by clicking on the check box, if it is registered with MSME. When the user will click on the checkbox, two more fields will be displayed to enter the "UAM number" & the "UAM Aadhaar/Mobile number"

Experience:
Under this Experience tab the user will have to enter the details such as Total Experience (in years), Total Experience with Govt (in years), Total number of Orders & view of Total number of Orders.

Bank Accounts:
Bank Account Details is one of the important section for the seller to receive the payment. In the section, the details, such as : IFSC Code, Bank name, Bank Address, Bank account Number(2 times for confirmation) & Account Holder name can be updated by the user. Multiple accounts can be entered in this section. The user can select the primary account by checking on the check box in the same page. By clicking on the save button, the details will be saved in the database and it will be displayed in grid view in the same page.

Once a account is selected as a primary cannot be changed. To change the primary account, the user will have to contact to the service desk.

My Team:

Under this section, the total number of registered user details will be displayed. Also a user can add a secondary user by sending him/her a invitation in this section. There is a button "Add Secondary user." By clicking on the "Add Secondary user", the email id of the user can be entered. Also the role can be assigned to the invited user. Multiple roles can also beassigned to the user by clicking on the Select Roles tab. The roles are "Can Create Bid", "Can Create Catalog", "Can manage order Fulfillment".

By entering the desired details, "Add User" button can be clicked. Upon clicking on the "Add User" an invitation link will be delivered to the invitees email id.

And in the email id, there will be a link "Verify me now". By clicking on the "Verify me Now" button, the user can follow the same registration process to get registered in the Gem website.

Updating profile : Trust_Society – Registration

There will be separate tabs displayed for different constitution type. When a Trust_Society user login to the system the following tabs will be populated. Such as: Seller Profile, Registered As, Company Details, PAN Validation, Authorized Person, Office Location, Startup, MSME?, Experience, Bank Accounts, My Team.

Seller Profile:
There will be some fields in this section such as First Name, Last Name, Mobile Number & email ID. All of these fields will be displayed pre filled by fetching the data from UIDAI system.

Registered As:
There will be a list of options in this section which can be selected by the user as per the requirement. The options are OEM, Reseller, OEM Service Provider, Non OEM Service Provider, Service Provider. By clicking on the desired checkbox, the user can click on the save button.

Company Details:
In the Company details tab, the user will have to mention the Company/ Firm/ Business Unit Name & the Date of Incorporation as it is mentioned in the "Certification of Incorporation".

PAN validation:
In the PAN validation section, the user will have to enter the PAN number and the name as mentioned in the PAN. In case of "Trust_Society" type of business, the user will have to enter the Trust_Society PAN number. After filling the desired details, the user will have to click on the "Verify PAN" button.

Authorized Person:
In this section, the authorized person name need to be entered by the user. The name should match to the name mentioned in the PAN details.

Office Locations:
In the Office Location section, the address details can be updated by filling up the desired details. All the entered address details will be displayed in a grid view. There seller can enter multiple address under this section.
The following details will be required to be entered for updating the address.

- Office name
- Type of Office - This can be selected from the dropdown. And the type of office can be selected as Registered/ Billing/ Manufacturing/ Service Center/ Godown.
- PIN Code
- State
- Town/City/District
- Flat/Door/Block No.
- Name of Premises/ Building/ Village
- Road/ Street/ Post Office
- Area/ Locality
- Mobile Number
- Email ID
- GSTIN

By filling the details in this form the user can click on the Save button. Upon clicking on the Save button, the details will be saved in the database and will be displayed in a grid view in the same page.

Startup:

Under this tab, the user can select yes by clicking on the check box, if it is registered with Startup India. When the user will click on the checkbox, two more fields will be displayed to enter the “DIPP number” & the “DIPP linked Mobile number”

MSME:

Under this tab, the user can select yes by clicking on the check box, if it is registered with MSME. When the user will click on the checkbox, two more fields will be displayed to enter the “UAM number” & the “UAM Aadhaar/Mobile number”

Experience:

Under this Experience tab the user will have to enter the details such as Total Experience (in years), Total Experience with Govt (in years), Total number of Orders & view of Total number of Orders.

Bank Accounts:

Bank Account Details is one of the important sections for the seller to receive the payment. In the section, the details, such as : IFSC Code, Bank name, Bank Address, Bank account Number(2 times for confirmation) & Account Holder name can be updated by the user. Multiple accounts can be entered in this section. The user can select the primary account by checking on the check box in the same page. By clicking on the save button, the details will be saved in the database and it will be displayed in grid view in the same page.

Once a account is selected as a primary cannot be changed. To change the primary account, the user will have to contact to the service desk.

My Team:

Under this section, the total number of registered user details will be displayed. Also a user can add a secondary user by sending him/her a invitation in this section. There is a button “Add Secondary user.” By clicking on the “Add Secondary user”, the email id of the user can be entered. Also the role can be assigned to the invited user. Multiple roles can also be assigned to the user by clicking on the Select Roles tab. The roles are “Can Create Bid”, “Can Create Catalog”, “Can manage order Fulfillment”.

	By entering the desired details, “Add User” button can be clicked. Upon clicking on the “Add User” an invitation link will be delivered to the invitees email id. And in the email id, there will be a link “Verify me now”. By clicking on the “Verify me Now” button, the user can follow the same registration process to get registered in the Gem website.

4.2.2 Seller registration as Secondary User

In GeM, Sellers and Service providers can register their Business organizations through a primary user using the steps mentioned in 4.2.1. There can be only one primary user for each organization. However, depending on their organization structure, Sellers/Service providers can create multiple secondary users for their organization who can work on GeM. Primary user can add the secondary users and assigned them specific roles. Following table illustrates step by step requirement to create the secondary user:

Use case – Secondary Seller Registration	
Description	**Secondary Seller Registration**
Pre-condition	**Primary User registration must be completed.** **Primary Seller should have details of secondary seller to be created**
Steps	Login as Primary seller Go To -> My Team (on View Profile) -> Add Secondary User • Step 1: Provide Secondary Seller Email ID. Step 2: The primary seller can assign following roles for secondary seller: i) Can Create Bid, ii) Can Create Catalogue, iii) Can Manage Order Fulfilment. Step 3: Email notification sent to email address of Secondary Seller. Step 4: By clicking on the “verify my now” link in the secondary users mail, the user will redirect to the “User Account Activation form”. Step 5: The user can fill the Aadhaar number and the mobile number linked with the Aadhaar number to verify the Aadhaar details with Gem portal. In this page the email id will be auto displayed by fetching the same from the data base. Step 6: If Aadhaar Number details provided by the user are not in order, User will be redirected to same screen to enter Aadhaar Number, and if the user has entered proper details he will get the OTP in his AADHAAR linked mobile number. Step 7: Enter OTP sent by UIDAI system to get the AADHAAR number verified.If OTP sent to User is not verified, User will be redirected to same screen again to enter the Aadhaar Number. Step 8: Upon successful verification, the user will get a message “Your Aadhaar and mobile number verification was successful. Please check your name as provided under Aadhaar. In case you want to rectify any of the information, you are required to get the same done with Aadhaar.”

	Step 9: Then the user will be redirected to the subsequent step of User Creation process. If OTP sent to User is verified, following details of User will be sent to GeM First Name, Last Name whatever is available in aadhar. Step 10: In the next step of user creation process, a form will be there with some of the fields pre filled from the UIDAI system. Such as: Aadhaar Number, Mobile number linked with Aadhaar, First Name& Last name. Step 11: User will be expected to insert – User ID, password (twice for confirmation), , Registered as Step 12: User account gets created. After creation of the account the user can login and update the further details under the "View Profile" section as mentioned above in the "Primary Seller Registration".

4.2.3 Links available on Seller update profile screens

Links	Purpose
Dashboard	Using this link, users can go back to their Dashboard.
Products	Using this link, users can navigate to their catalogue.
Create	Using this link, users can initiate a Vendor Assessment request.
Edit	Using this link, users can edit their registration profile and Assessment submissions.
Manage	Using this link, Primary users can create secondary users.

4.3 Add product to Market Place by Seller

Registered seller can offer the product to market. Once logged in seller can manage the products and create new products. Following table illustrates step by step requirement to offer the product to market.

Use case name–Add Product	
Description	*Add Product is the ability to add a Product in Gem Portal*
Basic flow	Login as Seller Product Upload and approval. For a product to get visible on Gem site the seller has to upload the product from his seller panel and the respective category manager (DCEO) has approved the same. Following five steps to upload catalogue: 1. General Information: It's the page where the seller provides the brand and golden parameters of the product.

Brand: existing brand can be selected or new brand request can be done.

Golden parameters: These are price deciding parameters for the added products. These parameters/specifications will be showing us as facets on the search page.

A person can pair/map his item with the existing identical item on the site. Through the pop-up window. He can select choose this item on the window to pair or he can click on proceed new to create a new catalog.

2. Catalog Information: The sellers have to provide the product related information on this page.

3. Offering Quantity and price: The seller has to provide the stock and price related details along with the delivery locations where he can deliver the product. He also has to confirm if he is selling the product as OEM or reseller. If the seller has selected as reseller he has to provide the Authorization Agency, Authorization number, Authorization date and Authorization validity date if these fields are made mandatory for that category. If not he can continue without specifying.

4. Product Specifications: On this page he has to provide the rest of the specifications relates to the product. These specifications differ from golden parameters. These are not price deciding factors like golden parameters.

5. Upload Images: The seller has to upload the images on this page. Three images are mandatory they can be same or different images.

6. After reading the terms and conditions he can publish the product. Once clicked on Publish it would be sent to the respective DCEO for approval.

Catalog Approval by (DCEO) covers following steps:

1. Pending: The DCEO checks the product and clicks on create new catalog. This then moves to image section.
2. Images: checks for the images and clicks on new catalog again. This then moves to features and specs section.
3. Features and specs: Checking the features he can create the new catalog.
4. The DCEO can also reject the catalog and also make some changes to the catalog.
5. Once it is approved by the DCEO the product will be visible on the site.

- Authorize Login as Seller
- Click on Catalog
- Click on Catalog and Product
- Click on “Add New Product”

Page	Description.	Behavior
GENERAL INFORMATION	Click on Catalog >Add New Catalog	Should navigate to the widow to select the respective category
GENERAL INFORMATION	Search the category through search box	Should display the list of categories matching the search text entered
GENERAL INFORMATION	Select the categories from the categories dropdown	Second, third and fourth level categories should display only the subset of the previous category selection
GENERAL INFORMATION	Brand Selection	Only the Brands specific to the category should be visible in the dropdown, Brands associated with other Category should not be displayed.

	GENERAL INFORMATION	Brand Selection	Select the Brand from the dropdown if available, else select unbranded
	GENERAL INFORMATION	New Brand creation If the required brand is not available in the dropdown, create a new brand	Click on “CLICK HERE” to add a new brand
	GENERAL INFORMATION	New Brand creation If the required brand is not available in the dropdown, create a new brand	Once the New Brand is created the same should not come in the brands dropdown untill the same is approved by respective DCEO in the CMS panel
	GENERAL INFORMATION	New Brand creation If the required brand is not available in the dropdown, create a new brand	Once the New Brand is approved the same should be visible in the dropdown
	GENERAL INFORMATION	If the product is not branded	Should be able to select Unbranded in the brand dropdown
	GENERAL INFORMATION	Enter EAN	EAN is not mandatory, so leaving it blank should not impact the catalog creation process
	GENERAL INFORMATION	EAN Validation	EAN if entered should be 13 Alphanumeric values digits and should accept Alphabets and special characters.
	GENERAL INFORMATION	EAN Validation	No two products of same seller can have same EAN
	GENERAL INFORMATION	EAN Validation	If existing EAN is entered then a popup will appear to pair this item with the existing item which has the same EAN
	GENERAL INFORMATION	Golden Parameters (Boolean)	Seller should be allowed to select either Yes or No
	GENERAL INFORMATION	Golden Parameters (Measurable Range)	- This should allow only valid numbers. - No alphabets should be allowed. - Only + - and. Are the only allowed special characters - Range should accept the value only within the range - Should allow to change the unit
	GENERAL INFORMATION	Golden Parameters (Measurable Value)	- Seller must be allowed to select only the predefined values in the dropdown. - Should not allow to change the unit
	GENERAL INFORMATION	Golden Parameters (Measurable Any Value)	- This should allow only valid numbers. - No alphabets should be allowed. - Only + - and . Are the only allowed special characters - Should allow to change the unit
	GENERAL INFORMATION	Golden Parameters (Numeric Range)	- This should allow only valid numbers. - No alphabets should be allowed. - Only + - and . Are the only allowed special characters - Range should accept the value only within the

			range
	GENERAL INFORMATION	Golden Parameters (Numeric Value)	Seller must be allowed to select only the predefined values in the dropdown.
	GENERAL INFORMATION	Golden Parameters (Numeric Any Value)	- This should allow only valid numbers. - No alphabets should be allowed. - Only + - and . Are the only allowed special characters
	GENERAL INFORMATION	Golden Parameters (Text)	Text should allow all characters (Numeric, text and special characters)
	GENERAL INFORMATION	Golden Parameters (Enumerable)	Should allow the sellers to select the values from the dropdown
	GENERAL INFORMATION	Golden Parameters (Date)	If a date range is set, seller should be allowed to select a date within that range any date outside the range is considered invalid.
	GENERAL INFORMATION	Golden Parameters (Date)	If a date range is not set seller can select any date.
	GENERAL INFORMATION	Golden Parameters (Ordinal)	To allow sellers to select the value from dropdown.
	GENERAL INFORMATION	Clicking on Proceed Under General Information	This should allow the seller to proceed to next stage only when the data entered under General Information are correct and as per the validation set, else it should throw an error.
	GENERAL INFORMATION	Product Pairing Iframe	- Once the seller clicks on Proceed under General Information a "Choose An Item" Popup will appear - This popup will be empty if there are no other sellers selling any item with same Golden Parameters. - This popup with have items if there is already a seller who has a product with same Golden parameters uploaded.
	GENERAL INFORMATION	Product Pairing Iframe	- If there are no products listed in the popup, click on "Proceed with New Item".
	GENERAL INFORMATION	Make and Model	- Enter Make and Model. - It accepts Alpha numeric and Special Characters. - Should not allow you to proceed if this field is left blank
	GENERAL INFORMATION	Product Name	- Enter Product Name - It accepts Alpha numeric and Special Characters. - Should not allow you to proceed if this field is left blank
	GENERAL INFORMATION	Product Description	- Seller can enter the custom description provided there is no description defined at the category level. - If description is defined at the category level, this field should not be editable
	GENERAL INFORMATION	Video URL	- Enter video URL. - There is no validation
	GENERAL INFORMATION	Is it certified by Agency?	- Clicking on Yes will give you the below fields - Certification Number -- Allows alphanumeric and Special characters

			- Certification Name – Will be a text box if there are no certification names defined at category Level, If defined at category level sellers will a dropdown to select from. - Certified Date – Choose any date from the calendar - Certification From Date – Choose any date from the calendar - Certification To Date.– Choose any date from the calendar - Action – Clicking on + will allow seller to add a new certificate. - Clicking on X will delete the entry.
	GENERAL INFORMATION	Clicking on SAVE / Proceed	-Clicking on Save / Proceed should save the page with contents already filled. - The catalog should move to Draft status. - Editing the catalog should allow you proceed from the last saved item.
	GENERAL INFORMATION	Clicking on SAVE / PROCEED	- Clicking on Save / Proceed should move to next step.
	OFFERING QUANTITY & PRICE	Selling Product As* - OEM	- In the dropdown we have OEM and Resellers. - OEM – There is no additional information required on selecting OEM.
	OFFERING QUANTITY & PRICE	Selling Product As* - RESELERS	- In the dropdown we have OEM and Resellers. - RESELLERS – On selecting Resellers few new additions fields will be display. - Authorization Agency* -- Enter the Agency name (Accepts alphanumeric and special characters) - Authorization No.* -- Enter Authorization No (Accepts alphanumeric and special characters) - Authorization Date* -- Select the date from the calendar - Authorization Validity* -- Select the form and to date from the calendar. (Should not allow proceeding if to date is below from date.
	OFFERING QUANTITY & PRICE	Harmonized System of Nomenclature (HSN) Number	- This field is not mandatory field - Should accept only numbers.
	OFFERING QUANTITY & PRICE	SKU	- This field is not mandatory and there is not validation set. - Accepts alphanumeric and special characters.
	OFFERING QUANTITY & PRICE	MRP In INR*	- Should allow entering any number if there is no price bound set at Category Level. - If the price bound is set at category level then the price entered here must be within the range. - If any value is entered outside the range system will not allow you to proceed. - Should not accept 0.
	OFFERING QUANTITY &PRICE	Offer Price including Taxes and Duties as INR*	- This is the Final price of the product after the discount. - Theirs should be a minimum of 10% discount on the MRP.

			- Should not allow any value less than 10% discount. - If there is any other discount slab set at the category level, the validation should work in line with the discount set in the category.
	OFFERING QUANTITY & PRICE	Discount	- This discount will be calculated on the Offer Price. - Multiple quantity slabs can be entered with the additional discount to be applied on the slab. - If there are multiple slabs the discount value should be incremental, it cannot be lesser than the discount of the previous slab
	OFFERING QUANTITY & PRICE	Delivery locations* - ALL INDIA	Select all India if the product can be delivered across India
	OFFERING QUANTITY & PRICE	Delivery locations* - STATE LEVEL	- Select State level if the delivery can be made only to selective states - A dropdown with list of states will appear and this is multiselect. - Select the states where this product can be delivered.
	OFFERING QUANTITY & PRICE	Terms Of Delivery*	- Free Delivery At Consignee premises - This option is prepopulated and this cannot be edited.
	OFFERING QUANTITY & PRICE	Current stock / Maximum quantity (to be delivered in 15 days. Delivery including lead time)*	- Should accept only numeric value.
	OFFERING QUANTITY & PRICE	Minimum quantity per consignee*	- Should accept only numeric value.
	OFFERING QUANTITY & PRICE	Lead time for direct purchase*	- Should accept only numeric value. - It is w.r.t to category
	OFFERING QUANTITY & PRICE	Clicking on SAVE / Proceed	- Clicking on Save / Proceedshould save the page with contents already filled. - The catalog should move to Draft status. - Editing the catalog should allow you proceed from the last saved item.
	OFFERING QUANTITY & PRICE	Clicking on Save / Proceed	- Clicking on proceed should move to next step.
	PRODUCT SPECIFICATION	Any addition Parameters	- This section will display the list of parameters other than the Golden parameters. - Validations on the respective set is same as Golden parameters.
	PRODUCT SPECIFICATION	Any addition Parameters	- If there are no Parameters, seller can proceed to next step.
	UPLOAD IMAGES	Images upload	- Uploading 3 images in mandatory - Should allow only .jpg or.png format.

			- Max resolution suggested is 5000*5000 System accepts image above threshold value but it will impact resolution.
	UPLOAD IMAGES	Save / Proceed	- Proceed should Only work when the I have read and agreed to terms and conditions of Government E-Market Place(GEM) box is checked and the seller has clicked on "Please click on this link to read terms and conditions". - Missing either of these steps should not allow the seller to click on Proceed.

4.4 Buying flows

In Gem buyer can decide to purchase the product by direct purchase, Bid or Reverse auction. Each or the software requirement is explained here subsequently.

4.4.1 Buying flow for Direct Purchase

Based on cost of the item Buyer can decide to go for direct purchase, Bid or Reverse auction.

Following table illustrates the steps for the buying flow decision:

Use case - Buying flow Direct Purchase	
Description	**Based on cost of items buyer can decide to go for direct purchase, bid or reverse auction**
Pre-condition	**Buyer is logged in Gem**
Steps	Login as Buyer **Go to Home->Market** **Select a product to buy** 1. Enter Quantity, select Delivery location, Year of Experience with Govt.etc. 2. If the Item cost is less than 50,000 buyers have the option to add the product directly to cart. 3. If the Item cost is 50,000 or more, then at least select minimum 3 items, in this case compare button will appear. System always compare L1 items with three items selected for comparison. 4. If cart value is less than 50,000 options for direct purchase will be provided. 5. In case of L1, if cart value is more than 50,000 and less than 30,00,000 then Direct Purchase option will appear. 6. In some automobile categories, direct purchase option will be available. 7. Once customer selects Direct Purchase, user needs to enter delivery days and Review the order and click continue to generate Demand 8. Post Demand generation financial Approval file has to be uploaded and relevant

	details has to be filled like designation of administrative and financial approval providing authority 9. User needs to select "Others" payment method and proceed to next page after upload of financial approval file. 10. On click of continue, contract order is generated which needs to be eSigned. On successful esign, order is placed to seller. 11. Once order is processed and delivered by seller, Consignee has to login with his account and go to dashboard select product orders>All orders to view all orders assigned to them. 12. Consignee will process order to confirm item delivery and the quantity and date of delivery 13. Once items are marked as received, Consignee has to generate CRAC (Consignee Receipt and acceptance certificate) 14. Consignee has to inspect the goods/product by them or Professional 15. If rejected enter the reason for rejection 16. Consignee has to enter the quantity accepted 17. After verifying consignee needs to click save and continue and eSign CRAC 18. Buyer has to go to the Dashboard and select bills 19. On the bill page Buyer has to select the payment method "Others" and then select the corresponding order number for which bill needs to be processed. 20. On the bills page buyer needs to review the order details and can download all the documents generated so far which include CRAC, invoice, financial approval and sanction order. 21. Buyer enters the mode and details of the mode by which payment was made offline. Details like transaction number and date and amount are mandatory. 22. Once details are entered and saved, the same information is sent to PAO for approval if PAO was selected during checkout, else buyer can approve it himself. 23. Once PAO or buyer approves, the payment details are sent to seller for intimation on his panel. 24. Order is marked as paid at this stage and completed.

4.4.2 PFMS Payment Method

Following table illustrates the steps for the buying flow decision PFMS Payment Method:

Use case - Buying flow direct purchase

Description	**Based on cost of items buyer can decide to go for direct purchase, bid or reverse auction**
Pre-condition	**Buyer is logged in Gem**
Steps	Login as Buyer **Go to Home->Market** **Select a product to buy** 1. Enter Quantity, select Delivery location, Year of Experience with Govt etc. 2. If the Item cost is less than 50,000 buyers have the option to add the product directly to cart. 3. If the Item cost is 50,000 or more, then at least select minimum 3 items, in this case compare button will appear. 4. If cart value is less than 50,000 options for direct purchase will be provided. 5. In case of L1, if cart value is more than 50,000 and less than 30,00,000 then Direct Purchase option will appear. 6. In some automobile categories, direct purchase option will be available even for non L1 items and comparison will not be mandatory. For e.g. cars and utility vehicles categories. 7. Once customer selects Direct Purchase, user needs to enter delivery days and Review the order and click continue to generate Demand 8. Post Demand generation financial Approval file has to be uploaded and relevant details has to be filled like designation of administrative and financial approval providing authority 9. User needs to select “PFMS” payment method, enter the required information and block the required budget before proceeding to next page after upload of financial approval file. 10. On click of continue, contract order is generated which needs to be eSigned. On successful esign, order is placed to seller. 11. Once order is processed and delivered by seller, Consignee has to login with his account and go to dashboard select product orders>All orders to view all orders assigned to them. 12. Consignee will process order to confirm item delivery and the quantity and date of delivery 13. Once items are marked as received, Consignee has to generate CRAC (Consignee Receipt and acceptance certificate) 14. Consignee has to inspect the goods/product by them or Professional 15. If rejected enter the reason for rejection 16. Consignee has to enter the quantity accepted 17. After verifying consignee needs to click save and continue and eSign CRAC

	18. Buyer has to go to the Dashboard and select bills 19. On the bill page Buyer has to select the payment method "PFMS" and then select the corresponding order number for which bill needs to be processed. 20. On the bills page buyer needs to review the order details and can download all the documents generated so far which include CRAC, invoice, financial approval and sanction order. 21. Buyer reviews and saves the bill 22. Once details are saved, the same information is sent to DDO for approval. 23. Once DDO approves and finalizes the bill, he needs to eSign the bill. 24. After eSign, DDO gets the button to trigger the payment, clicking on which payment information is sent to PFMS. 25. DDO also has a button to check the status of the payment request

4.4.3 Bunching Buying flow for direct purchase

Description of Bunching	Bunching is a process of buying multiple products in a single order. Significant portion of buying on GeM constitutes purchasing multiple products together. New functionality will enable Buyers to select multiple products from Market Place; restricted to single seller; and place a single order. This will ensure consistency in buyer experience irrespective of number of products s/he is looking to purchase.
Pre-condition	**Buyer is logged in Gem**
Steps	Login as Buyer Go to Home->Market Select multiple products to Buy Bunching cart value is less than 50000 for Direct Purchase and Buyer can select multiple products from market place restricted to single seller. Comparison is applicable in case of multiple Basically Pairing means to define the products combinability e.g. Paper is combinable with Scissors. Pairing of the product has to be approved by DCEOs & done by our internal admin tool. 1. Enter Quantity, select Delivery location, Year of Experience with Govt. etc. 2. If the total cost of cart is less than 50,000 buyers have the option to go for direct purchase 3. If the cart cost is 50,000 or more, and all products of cart provided by multiple

	sellers. System forces users to compare. 4. In case of L1, if cart value is more than 50,000 and less than 30,00,000 then Direct Purchase option will appear. 5. Once customer selects Direct Purchase, user needs to enter delivery days and Review the order and click continue to generate Demand 6. Post Demand generation financial Approval file has to be uploaded and relevant details has to be filled like designation of administrative and financial approval providing authority 7. User needs to select “Others” payment method and proceed to next page after upload of financial approval file. 8. On click of continue, contract order is generated which needs to be eSigned. On successful esign, order is placed to seller. 9. On seller logging in to the portal will have option to list the entire list of orders, and can filter product related orders and service related orders. 10. Once order is processed and delivered by seller, Consignee has to login with his account and go to dashboard select product orders>All orders to view all orders assigned to them. 11. To confirm the delivery of shipment, seller has to generate invoice by filling up the details of Gem Invoice no, seller invoice no, invoice date, billing address, date of dispatch, mode of dispatch, supplied quantity, GST components.Post that will click on generate button to generate the invoice copy in pdf format. 12. The seller also has option to sort the order data in shipment wise, consignee wise and product wise to have fair details about the contract. In case of shipment wise will have further option to drill down to shipment specific details to understand the status of CRAC, or payment statuses. 13. Consignee will process order to confirm item delivery and the quantity and date of delivery 14. Once items are marked as received, Consignee has to generate CRAC (Consignee Receipt and acceptance certificate) 15. Consignee has to inspect the goods/product by them or Professional 16. If rejected enter the reason for rejection 17. Consignee has to enter the quantity accepted 18. After verifying consignee needs to click save and continue and eSign CRAC 19. Buyer has to go to the Dashboard and select bills 20. On the bill page Buyer has to select the payment method “Others” and then select the corresponding order number for which bill needs to be processed.

	21. On the bills page buyer needs to review the order details and can download all the documents generated so far which include CRAC, invoice, financial approval and sanction order. 22. Buyer enters the mode and details of the mode by which payment was made offline. Details like transaction number and date and amount are mandatory. There are two approval flows: Approver as Buyer: 23. Once details are entered and saved, the same information is sent for approval to Buyer if PAO is not selected during check out. 24. Buyer can re-verify payment related details related to offline transactions and approve. Approver as PAO: 25. Once details are entered and saved, the same information is sent for approval to PAO if PAO was selected during checkout. 26. PAO can re-verify payment related details and approve. The payment details are sent to seller for intimation on his panel. 27. Order is marked as paid at this stage and completed.

4.4.2 Buying flow for Bid

The Bid creation process on GeM starts after Buyer finalizes the product (s) to be procured on the marketplace. When the estimated cost of the procurement is above certain amount [at the time of writing this document, it is Rs. 50,000/-] then Buyers may choose to go for L1 Compare & Buy or Bid/ process. However, if the estimated cost of procurement is more than certain amount [at the time of writing this document, it is Rs. 30,000,00/-] then it has to mandatorily go for either Bid or RA process to complete the procurement.

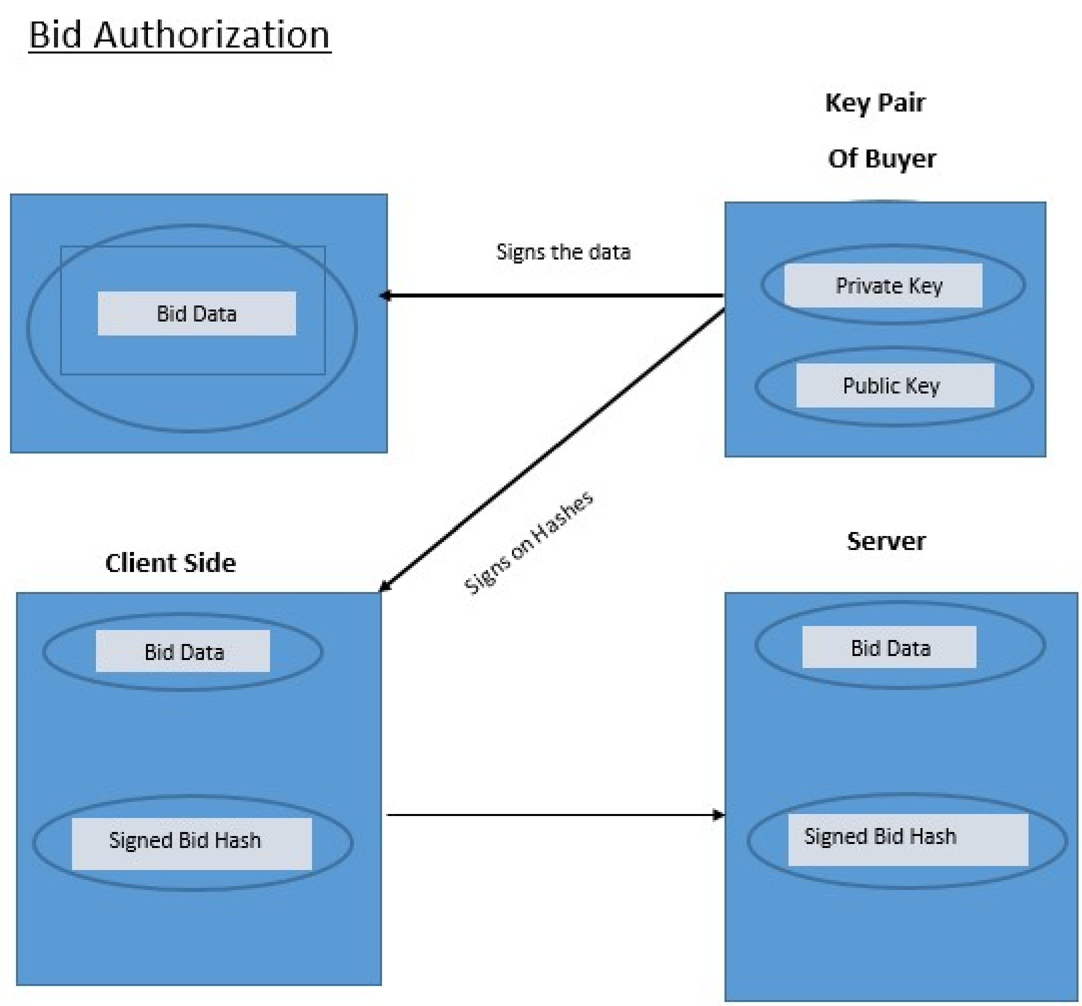
Steps for floating the bid:

Use case - Buying Flow–Bid creation	
Description	**Based on cost of items buyer can decide to go for bid or reverse auction**
Pre-condition	**Buyer is Login on GeM**
Steps	Login as Buyer **Go to Home-> Markets** **Select a product to buy** 1. Click on Select Consignee,Enter Quantity, select Delivery location, Year of Experience with Govt.,etc. If the Item cost is less than 50,000 buyers have the option to add the product directly to cart.

	2. If the Item cost is 50,000 or more, at least select minimum 3 OEM to compare, in this case compare button will appear. 3. If Total Product value is less than 50,000 options for direct purchase and BID/ will be provided. 4. If Total Product value is more than 50,000 then options for RA/BID is provided. 5. In case of L1, if Total product value is more than 50,000 and less than 30,00,000 then Bidding and Reverse Auction, Direct Purchase option will appear. 6. If Total product value is more than 30,00,000, only Bidding and Reverse Auction option will appear. 7. To create Bid, user needs to click on Bid button.General attributes for Bid like, bid for, Division, e Market Place Order Reference No., Bid Validity etc. will be auto-fetched from marketplace. Also item (s) and their specifications, Consignee details with quantity per consignee and delivery days per consignee will be auto-fetched. 8. Buyer can view details specification of the item (s) to be procured which is fetched from the marketplace. **Where there are multiple values associated with any specific specification of the item, Buyer can choose the appropriate value from the list as per requirement**. After confirming the item specification Buyer can go to the next step. 9. Buyer can view the consignee details fetched from the marketplace. If needed buyer can modify the quantity and delivery days for each consignee and also import additional consignees using an excel file. The format for importing consignee is pre-defined which can be downloaded by Buyer. After completing the consignee details, Buyer can continue to the next step. 10. Buyer has to mandatorily set the end date for Bid submission activity and define the Bid validity period in days. Here, Buyer can also set bidders eligibility parameters for participating in bid. After completing this task, Buyer can continue to the next step. 11. Buyer can set whether EMD and ePBG are applicable to the bid or not. If either EMD or ePBG or both of them are applicable then Buyer has to enter certain mandatory information like, advisory bank name, EMD/ePBG percentage, duration of ePBG, Buyer Bank details etc. After entering all the required information for EMD/ePBG, buyer can continue to the next step. 12. On this step, buyer can define the bid award criteria such as whether the bid will be awarded to a single bidder or the bid can be splitted between multiple bidders. If Bid is to be splitted between multiple bidders, then Buyer need to define the percentage of splitting amongst the bidders. After completing this step buyer can continue to the next step. 13. On this step, buyer can import bid specific terms & conditions from library and attach to the bid. Buyer can choose the applicable terms & conditions and after importing them into the bid, buyer can edit the values according to the bid requirement. However, editing the values of the terms & conditions are restricted within the list of pre-defined values of the library. In this step, buyer can also specify the list of documents required from bidders as part of their bid response. After completing this step buyer can continue to the next step. 14. After completing all the above steps, buyer can generate the bid document in PDF format and do

	eSign. System will invoke the third party eSign service, doOTP authentication and complete the process. 15. After completing the eSigning process, bid gets published successfully and all eligible sellers are notified by email and SMS service.

Hashing Mechanism



4.4.3Bid response by Seller- use case

This requirement is set of steps bidders have to perform on the GeM portal in order to submit their BID response. When a bid order is placed in market, GeM system notifies the sellers of the ordered product OR service. Following table illustrates the bid response requirement by buyer:

Steps for offers submission:

Use case –Seller offer submission	
Description	**Based on category bidders will submit their bid response**
Pre-condition	**Seller is login on GeM**
Steps	1. Enter user id, password and Captcha to login into GeM portal. 2. On the Seller Desk, click on Bid link to access all the published and eligible bids. 3. To participate on a Bid, bidders are need to click on Participate button. 4. Preparing technical bid response - Bidder can view the product speciation (as defined by buyer) by clicking on the product name. 5. Bidders can offer products/services on the bid response only when there is anapproved product/services are available in his/her catalogue. Click on Participate link to access his/her catalogue and choose the product/services to offer. After adding offered product specification bidder can continue to the next step. 6. Bidders can enter the unit price of the product. System will auto calculate the total offer amount. After entering the unit price, bidders are required to encrypt the price before continuing to the next step. 7. Bidders can upload supporting documents to their bid response if otherwise specified by buyer in the bid. 8. After completing all the above steps, bidders are required to do eSign on their bid response. System will invoke the third party eSign service, do OTP authentication and complete the process. 9. After submission of bid response, bidders are allowed to withdraw their submission before the end of bid submission activity. In the event of withdrawal of bids, bidders are mandatorily required to enter the reason for withdrawal.

4.4.4Bid Opening and evaluation by Buyer - use case

After the end of bid submission date & time, bid opening process is initiated. Bids are open in two stages – First Technical bids are opened and evaluated. Basis of Technical bid short listing, Commercial bids of the technically responsive bidders are opened in the next stage.

Following table illustrates the bid creation requirement by buyer:

Steps for Bid opening:

Use case –Buyer bid opening	
Description	**Technical Bid Opening and Evaluation**
Pre-condition	**Buyer is login on GeM** **Minimum three bid response should be received**
Steps	1. Enter user id, password and Captcha to login into GeM portal. 2. Click on Bid no. to be opened. 3. Click on Technical Evaluation button. 4. System will show the list of sellers who has participated in that bid with all the technical specs. 5. User has to click on Reject / Select button for rejecting or short listing the seller. After clicking on the button, system will ask for comment of rejection/Selection.

4.4.6 Commercial Bid open by Buyer - use case

Once sellers have submitted the response, bid opening process is initiated. Following figure illustrates the bid creation requirement by buyer:

Steps for commercial Bid opening:

Use case –Buyer technical bid opening	
Description	**Commercial Bid Opening**
Pre-condition	**Buyer is logged in Gem**
Steps	1. Enter user id, password and Captcha to login into GeM portal. 2. Click on bid to be opened. 3. Click on Financial Evaluation button. 4. System will show the sellers list who got shortlisted in the technical evaluation. 5. System will show the L1,L2… Ln sellers. 6. In cases of no or less participation(For split bids) , bid will be cancelled by the buyer or Admin 7. In Case of a tie (2 or more sellers with the same price) bid will be awarded to the seller first-come-first-serve basis.

Following figure illustrates the Bid opening by buyer:

4.4.7 BID to RA Functional Flow-

Buyer can convert Bid to RA post technical qualification of sellers& viewing L1 price. After technical evaluation

Sr. No.	Requirement	Responsibility
1.	Buyer shall be given two options. **Open & Award** and **Proceed to RA**. L1 name will be masked on this screen.	Buyer
2.	If buyer select Open and Award then buyer can view seller names and their prices. Buyer cannot go back and create an RA if he/she proceeds with this option.	Buyer
3.	If buyer select Proceed to RA, then only once the RA has ended buyer can proceed with financial evaluation.	Buyer
4.	If buyer selects Forced RA then if there are more than one L1, buyer has to mandatorily proceed to RA Minimum two bids/participations are required, in order to proceed to RA.	Buyer

Sr. No.	Requirement	Responsibility
5.	RA creation Steps:- Buyer can convert the Bid into a RA. RA will be published, on buyer's eKYC verification only. Name of L1 seller is masked	Buyer
6.	RA seller screen Sellers has to complete an eKYC verification before participating in the bid.	Seller
7.	RA Participation rules 1) Reference price for RA will be the L1 Price. 2) Duration of RA and number of auto extensions will be selected by Buyer at the time of creating RA 3) RA Auto Extension Rules -- If RA Bid is entered within x minutes before end time, RA will be auto extended by y minutes (In default configuration x=15 min and y=15 min) -- RA Bid will be auto extended based on number selected by the buyer. 4) RA Manual Extension -- Buyer can manually extend the bid 3-10 times if needed.(Configurable) 5) RA Decrement Rules Up to 10% of RA reference price, Seller will be able to reduce price in multiples of 0.1% (This can change in the future). For more than 10% of RA reference price, Seller will be able to reduce price in steps of .01% at a time (This rule can change in the future). 6) Seller will have to verify eKYC every session once to participate in RA. 7) Once RA is complete, the award process will be same as for the Bid. 8) RA in case of split bid and service is not available. These features will be taken up in phase 2.	seller
8.	Open Financial Evaluation If there is a ePBG, 'waiting for ePBG' appears at the bottom. (a)OFFLINE PROCESS - On clicking 'request for ePBG' on bid finalization page, seller gets a notification via email. 'Download & Submit ePBG document' appears in seller's bid participation page. Sellers can uplaod their BG copy, buyers can download/view and proceed with order creation accordingly. (b) ONLINE PROCESS -On clicking 'request for ePBG' on bid finalization page, seller gets a notification via email. 'Download & Submit ePBG document' appears in seller's bid participation page., seller gets a notification. When GeM gets a ePBG completion confirmation (through an API) from the bank, after which buyer proceeds with order creation.	Buyer

Sr. No.	Requirement	Responsibility
9.	1.3.5 Order creation Same as order flow	Buyer

4.5Encryption / Decryption functionality

Introduction

This document briefs about the methodology used by Bid system for encryption, decryption using Hardware Secure Module (HSM).

8. Encryption and Decryption using Java Script and HSM.

a. Introduction of HSM and Java Script:

Hardware Secure Module (HSM)

A hardware security module (HSM) is a physical computing device that safeguards and manages digital keys for strong authentication and provides crypto processing. These modules traditionally come in the form of a plug-in card or an external device that attaches directly to a computer or network server.

Deployment of HSM

- The HSM box will be hosted in the data center
- The HSM box will be deployed in High Availability (HA) mode so that
- Backup policy of all keys is available.

Protocols/Standards used in HSM

- HSM – FIPS 140-Level 2
- Cryptographic algorithm: RSA -2048 (currently it is RSA 256)

b. Encryption:

The encryption algorithm is RSA and the strength is 2048 bits (256 bytes). The encryption methodology is asymmetric using the key pair comprising of Public and Private Key. Public Key is used for encryption and corresponding Private Key for decryption.

The detailed process is mentioned below:

1. User enters data in the form/page and clicks on save.
2. The plain data travels to Base 64 encoded data is submitted at the back-end bidplus application over TSL communication channel. The back end application consumes HSM box agent soap service for encryption of the data.
3.
4. After encryption, data stores at the application database.

c. Decryption:

5. The user clicks on the decrypt button. The system sends encrypted data to HSM box though API call in SSL connection. The HSM calls the private key of the user and decrypts the data. The HSM then returns the decrypted data to the form through SSL connection.
6. The system now sends the decrypted data to the server
7. Decryption is done using the buyer's private key.

4.6. Contract Generation and Order Fullfilment

Contract management is to enforce the central repository maintenance of General Terms and conditions, Special Terms and conditions, SLA related Terms and conditions. Also to maintain the version history of clauses in encrypted format, under the supervision of the GeM legal admin. The proposed system in fulfilling the order have been made robust and user friendly for buyer and seller. An order placed through direct purchase or e BID/~~RA~~, seller is entitled to deliver the goods as per agreed terms and conditions while registering with GeM.

The contract is generated for both Products and services when an order is placed and accepted by seller

Use case – Order Acceptance and Contract generation – Direct Purchase	
Description	**Order Acceptance and contract generation – Direct purchase**
Pre-condition	**The Buyer has placed the order using Direct Purchase option**
Steps	Step1 – Login to GeM Step2 – Go to the Orders on Dashboard Step3 – View the List of Orders

	The List will display all the orders – pending acceptance, accepted, in progress,, etc For Orders Pending acceptance, an Accept Button would be getting displayed. Step 4 – Click on the Accept Button Step 5 – Verify the Acceptance by authenticating using eKYC Step6 –The Contract is Generated after successful eKYC Step 7 – View/Download the Contract

Use case – Invoice Generation and Order Fulfillment	
Description	**Invoice Generation and Order Fulfillment**
Pre-condition	**The Seller has received orders from Buyers**
Steps	Step1 – Login to GeM Step2 – Go to the Orders on Dashboard Step3 – View the List of Orders The List will display all the orders – pending acceptance, accepted, in progress,, etc Step 4 – Select an Accepted Order The Details of the Order will be displayed. The Order Details will include the details of the product, consignees, seller, Buyer, Order status and quantity and price information. The Orders can be viewed in three modes – Shipment wise, consignee wise and product wise. Step6 – Select the Product wise View The Order details will be displayed product wise. This will be the Default View. This view shows the Order details with reference to products in the Contract. The New invoice for the Pending quantity can also be generated from here. Step7 – Select the Consignee wise view The order details will be shown with respect to each consignee in the Contract. Step8 – Select the Shipment wise view This view will show the details of the shipments that have been made. This will also display the Invoices generated for each shipment. Step9 – Select the "Download" button to Download the existing Invoices Step10 – Click on the View Button to view the Invoice Details Step11 – In case, new Invoice is to be generated, click on Generate Button in Product wise View Step 12 –On click of generate option, the Invoice generation screen will open up Step13 – Specify the Invoice details - Seller Invoice Number, Invoice Date, Billing Address, Date of dispatch, Mode of Dispatch, bank account Number Step 14 – Specify the Product Details – Supplied Quantity, CGST, SGST, Cess System automatically will calculate the Value for GST and Total Invoice price Step 15 – Specify the Freight details – Freight Cost, Freight CGST, Freight SGST, Freight Cess. System Automatically will calculate the value for Freight GST and Total Freight Cost Step 16 – The system generates the Total Invoice Value Including Product and Freight inclusive of all taxes. Step 17 – Accept Terms and conditions by clicking on the Acceptance Checkbox. Step18 – Click on the Create Button to generate the Invoice. Step 19 – Click on the Back Button to go back to the Order Details.

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5. Non Functional Requirements

In addition to functional requirements Gem will support nonfunctional requirements as given in following table:

Table: Nonfunctional requirements

RFP Volume	RFP Section	Deliverable	Clauses from RFP (ASK)
1	10.2.4	Portal - ARX	UI layer should not have its data
			The portal should not allow concurrent sessions for same user. The system should automatically log out a customer in case of session breakdowns (e.g., communication failure, high inactivity period - these should be parameterized
			The portal should support workflows
		ARX	The portal should implement security features, such as password complexity, automatic blocking (temporary/permanent) of user logins after given number of unsuccessful login attempts (should be parameterized), controlled access to content stored on the portal and logging of security incidents. It should by its own or through an integrated Identity Management solution and should be capable of managing security rights and privileges by individual, group and role.
		SSL	Portal should support HTTPS protocol on Secure Socket Layer (SSL)
			The portal should support the leading browsers such as Internet Explorer, Firefox, and Chrome etc.
			The portal should be able to expose /publish functional applications seamlessly
		SOLR	The portal should provide search engine with advanced full-text search capabilities. The search engine should be able to search for requests within the portal.
			i. Should provide support for comprehensive audit trail features such as:
			ii. Daily activities log should be merged into the history log files
			iii. Date, time and user-stamped transaction checklist should be on-line generated for different transactions
			iv. All transaction screens should display system information
			v. Daily activity reports should be provided to highlight all the transactions being processed during the day
			vi. Unsuccessful attempts to log-in to the system should be recorded
			Portal should be compatible to popular mobile devices Operating

RFP Volume	RFP Section	Deliverable	Clauses from RFP (ASK)
			systems
			Portal should be interoperable with industry standard databases
			In addition the portal should provide the following capabilities
			i. Should have multilingual capabilities with regional, localization and Unicode support.
			ii. Should be able to integrate with common office application
			iii. Should authenticate users from Active Directory/LDAP, claim based authentication
			iv. Should support virtualization
			v. Should support customization of look and feel of the portal
			vi. Should support a broad range of standards, preferably open standards. Some examples are DOM 1.0, HTML 5, HTTP, HTTPS, MathML, ODBC , ODF (IS26300) , Open XML (IS29500),OpenSearch, OpenType, PDF 1.7, PDF/A, RTF, RSS, ATOM, SOAP, SVG, REST, UDDI, Unicode, URI/URN, W3C XML Schema, WCAG 2.0, WebDAV, WSDL, WSRP, XHTML, XML, XML Web Services, XMLDsig, XPATH, XPS, XSLT
			Should integrate with standard email services
			Should integrate with instant messaging services
			Should integrate with any other portal products through open standards such as HTML, XML, RSS, web services, and WSRP.
			Should support encryption and compression features
			Should support multiple roles with associated access controls.
			Should support upload, store, organize and share documents
			Should provide multi-channel output capabilities
			Users should be able to upload documents in multiple formats
			Users should be able to upload multiple files at the same time
			Should support version control, change tracking and comments in these documents
			i. Should support document linking capabilities (static, dynamic, and/or other)

RFP Volume	RFP Section	Deliverable	Clauses from RFP (ASK)
			ii. Should support the import of content into the repository
			iii. Should support document and text indexing capabilities
			iv. Should support image indexing capabilities
			v. Should be able to support to store and manage documents in the same repository
			vi. Should Support Managed Metadata
			vii. Should support content archiving capabilities
			viii. Should provide offline support for forms
			ix. Should support creation of ad hoc query by users
			x. Upload document will be in XML, CSV and excel. Scanned document will be in PDF and images in JPEG, PNG.
			xi. While uploading bulk data it should also tell for errors if it encounters any.
1	10.2.4	Mobility Services - CT	The MSP shall create the GeM Mobile App (both for Android and iOS) in the Phase-2 in compliance to the requirements specified in Annexure-B. The indicative services that need to be accessible through Mobile app should include Plain Buy, Plain L1 Buy, Reverse Auction, Forward Auction, Demand Aggregation, etc. However, for e-Tendering module, the MIS reports need to be made accessible on Mobile App and not full e-Tendering functionality. The detailed requirements of Mobile App shall be finalized at FRS/ SRS stage.
			i. The Mobile Application should provide an intuitive and user friendly GUI that enables users to navigate and apply actions with ease. The GUI should be responsive with very little or no delays or time lag at launch or whilst navigating through screens.
			ii. It should enable ease of configuration and changes to existing GUIs, and support the introduction of new screens.
			iii. It should provide on screen tips and online help to aid users while interacting with it.
			iv. Should make use of data available in the existing database and reduce duplicate data entry
			v. Incorporate analytics into mobile app, to track and identify users experience and actions.
			vi. Apps should be easily customizable and easy to Administer data in the GEM database

RFP Volume	RFP Section	Deliverable	Clauses from RFP (ASK)
			vii. Network level security, traffic should be encrypted using secured connectivity
			viii. Should structure overall content with proper tagging to make them screen reader friendly.
			ix. Application should ensure Compatibility with all platforms such as Android & iOS. x. Solution should develop resolution independent design structure i.e. Mobile Application should adjust itself automatically as per the screen resolution of the Mobile
			xi. Mobile Apps should work flawlessly across different platforms
			xii. There should be minimum use flash contents so that home page should be loaded quickly
			xiii. It should not occupy excess client's Mobile RAM.
			xiv. Should provide Role Based Access control
			xv. Should come with mobile threat prevention and recovery system
			xvi. Should support authentication using Digital Signature/ e-Sign
			xvii. Should have facility to download and upload files, including eForms
1	10.2.4		Support easy workflow configuration, its maintenance, and need based modification, addition alteration of the steps.
			Support process modeling based on BPMN2 notation standard
			Facility to simulate a process before launching it so that appropriate changes can be made based on findings.
			Provide business rule engine and a management platform. Users shall be able to modify the business rules online without any need of deployment. System shall also have business rule connector so that it can talk to any 3rd party business rule engine
			Allow saving custom BPM templates so that end user can tailor a business process based on any of the custom template.
			Offer performance monitoring features for the business processes. The system shall be capable of identifying, reporting inefficient processes and operations and/or those with high level of error and omission

RFP Volume	RFP Section	Deliverable	Clauses from RFP (ASK)
			Expose W3C standard web services and REST based web services so that it can communicate to any other technology layer seamlessly.
			Have capabilities which will enable business activity monitoring and capture audit trail of all transactions as well. Web based dashboard shall be made available for accessing all reports.
			Provide dashboard view for showing multiple reports. Dashboard view and content can be customized for individuals.
1	10.2.4	Notifications & Messaging Service	i. The gateway must be as per prevailing TRAI/DoT norms
			ii. Should contain required details /information and targeted to the applicant or designated officers of tax departments and other stakeholders
			iii. Support automated alerts that allows to set up triggers that will automatically send out reminders
			iv. Provide provision for International SMS
			v. Resend the SMS in case of failure of the message
			vi. Should be instantaneous with almost no waiting time.
			vii. Must have common features like non-acceptance of landline nos., unacceptable mobile nos. etc.
			viii. Should Support for Long text messages
			ix. The message shall be sent though command line interface/API, Web Interface provided by the Service Provider.
			x. The vendor shall maintain DND controls.
			xi. Should provide standard reports like success/failure report on current as well as historical/cumulative basis.
			The Notification Services will let the GeM application users perform simple email functions, such as view, create and delete messages, automatically create messages as part of the business flow with attachments and reply to or forward an existing mail. It simply enables users to use mail, manually or automatically, in a single collaborative environment. The Notification Services expose data from an existing mail server based on IMAP4 and SMTP protocol.
			Notification Services also include services which will send emails & SMS alerts and notifications to the interested candidates (supplier or GeM application end users) based on specific business process

RFP Volume	RFP Section	Deliverable	Clauses from RFP (ASK)
			event that occurs during the service request life cycle. The flexible architecture of Notification Services will eliminate the pains of implementing features such as polling events, scheduling, formatting and delivery of notifications.
			The trigger for sending the SMS can be event-driven as well as time-driven. There are two typical scenarios for SMS communication (i.e. sending and receiving SMS) that will cater to the GeM functional requirements of (i) alerting users (officials, citizens) through SMS notification and (ii) receiving SMS request from citizens to get service request update information. The SMS application will expose java API to initiate the SMS broadcasting or alert notification.
1	10.2.9	Quality Assurance	A thorough quality check is proposed for the GeM system and its modules, as per standard Software Development Life Cycle (SDLC) . MSP is expected to lay down a robust Quality Assurance program for testing of the developed application for its functionality, performance and security before putting in production environment. The program must include an overall plan for testing and acceptance of system, in which specific methods and steps should be clearly indicated and approved by GeM. MSP is required to incorporate all suggestions /feedback provided after the elaborate testing of the GeM, within a pre-defined, mutually agreed timeline.
			a. Outline the methodology that will be used for testing the system.
			b. Define the various levels or types of testing that will be performed for system.
			c. Provide necessary checklist/documentation that will be required for testing the system.
			d. Describe any technique that will be used for testing the system.
			e. Describe how the testing methodology will conform to the requirements of each of the functionalities and expected outcome.
			f. Indicate /demonstrate to GeM that all applications installed in the system have been tested.
1	10.2.9.1	Automated Testing	a. Should support multi-layer test scenarios with a single solution.
			b. Should support and execute testing on GUI and UI-Less (standard Web Services, non-SOAP Web Services, such as REST, etc.) Components
			c. Should allow version control of tests and test assets providing ability to compare versions and identify changes.

RFP Volume	RFP Section	Deliverable	Clauses from RFP (ASK)
			d. Should allow centralized storage and management of tests and test assets including external resources used by tests.
			e. Should have an IDE environment for QA engineers which should be configurable.
			f. Should provide local system monitoring to test and validate performance issues including memory leakage, CPU overload and network overload to determine if specific business scenarios exceed desired performance thresholds.
			g. Should provide Auto-documentation while creating of automated tests.
			h. Should generate reports that can diagnose defects and can be exported to (PDF, XML, Html) (mandatory) and doc (optional) formats.
			i. Report with summary data, pie charts and statistics for both the current and previous runs needs to be provided.
			j. Should enable thorough validation of applications through a full complement of checkpoints such as GUI object, database, XML, XPath, etc.
			k. Should provide Unicode support for multilingual application testing.
			l. Should be able to record the test Execution into a video file for viewing later.
			m. Should provide facility to parameterize tests to generate/assign test case output values automatically during runtime.
1	10.2.9.2	Performance and Load Testing	a. Testing workload profiles and test scenarios based on the various functional requirements should be defined. Application as well as system resource utilization parameters that need to be monitored and captured for each run also needs to be defined.
			b. Should support application testing and API testing including HTTP(s), web services, mobile applications and different web 2.0 frameworks such as Ajax/Flex/HTML5.
			c. MSP should perform the load testing of GEM application for multiple workload profiles, multiple scenarios, and user loads to handle the envisaged users of the system.
			d. Different activities before load testing i.e. identification of work load profiles, scenarios, information capturing report formats, creation of testing scripts, infrastructure detailing and workload profile should be prepared before the start of actual load testing

RFP Volume	RFP Section	Deliverable	Clauses from RFP (ASK)
			exercise.
			e. Solution parameters needs to be tuned based on the analysis of the load testing reports. The tuning process could be iterative until the issues are closed. Multiple loadsrun needs to be executed for users to simulate different scenarios, such as peak load (year end, quarter end, etc.), load generation within the LAN, Load generation across WAN or mobile network simulator while introducing configurable latency/jitter/packet loss etc. f. Should eliminate manual data manipulation and enable ease of creating data-driven tests.
			g. Should provide capability to emulate true concurrent transactions.
			h. Should identify root cause of performance issues at application or code level. Include code performance analysis to quickly pinpoint component-level bottlenecks: Slowest classes and methods, most frequently called methods, most costly (aggregate time spent for each method), response time variance etc.
			i. Should allow selection of different network bandwidth such as analog modems, ISDN, DSL, or custom bandwidth.
			j. Should be able to monitor various system components e.g. Server (OS, Web, Application & Database) Monitoring, Network (between Client & Server) Delay Monitoring, Network Devices (Firewall, Switch & Router) Monitoring during the load test without having to install any data capturing agents on the monitored servers/components
			k. Should correlate response times and system performance metrics to provide quick insights in to root cause of performance issues.
			l. Reports on following parameters (but not limited to) such as transaction response time, transaction per second (Passed), user interface rendering time, transaction per second (Failed), web transaction breakdown graphs, hits per second, throughput, HTTP responses per Second, pages downloaded per second, system infrastructure performance metrics etc.
			m. Should provide End-to-End system performance analysis based on defined SLAs. Should monitor resource utilization including memory leakage, CPU overload and network overload. Should have the ability to split end-to-end response time for Network & Server(s) and provide drill-down capability to identify and isolate bottlenecks.

5.1 *Customer Experience*

GUI interface for end user should fulfill the following requirements:

- Mobile responsive – should work on mobile devices like tablet, smart phones
- Should be secure
- Should be intuitive – user should type less e.g. provide LOVs wherever applicable
- Presentation layer should not store any data
- Should support multiple languages
- Should be accessible to differently abled people
- Should Expose W3C standard web services and REST based web services so that it can Communicate to any other technology layer seamlessly

5.2. Performance

Portal should Offer performance monitoring features for the business processes. The system shall be capable of identifying, reporting inefficient processes and operations and/or those with high level of error and omission.

Portal should be scalable and should support following mix of concurrent users:

Item	% of concurrent users
Registration, profile management, & product upload	3
Browsing	30
Catalogue update	7
Adding to cart	35
Order finalization with payment	25

5.3. Analytics

For reporting and data ware house solution Qlik tool has been identified.
This section of the document details data flow of *"to be"* interactions for the program.
All the systems will be combined under single enterprise Qlik based data warehouse and all the reports will be hosted on GeM portal.

5.3.1 High Level data flow

ETL layer is responsible for extracting the data from source system (i.e. ERP and Excel) and insert into respective applications UI.

The purpose of the ETL is to directly address the requirement to extract/import the data from source systems, transform the data as per the Business Logics and act as derived data source for UI.

The architecture consists of three layers:

• **Extract/Staging Layer:** The purpose of this layer is to extract data from source systems as soon as possible so as to put minimal load on source systems

• **Transformed/DWH Layer:** The purpose of this layer is to hold transformed data and provide data to reporting layer

• **Final/Reporting Layer:** The purpose of this layer is to provide output in form of reports and dashboards to end user for analysis

5.3.2 Qlik Rest connector Architecture

The Qlik REST Connector enables Qlik Sense to efficiently load data into a Qlik Sense app from a REST data source. Many web-based data sources expose data through a REST API. The Qlik REST Connector is a generic connector, that is, it is not tailored to a specific REST data source.
There are variations in the way the REST API is implemented by different data sources that use it. Users must learn the requirements of each data source. The Qlik REST Connector provides connection options to accommodate those varied requirements.
To access data, the user must have authorization with current access credentials to the data source. Once a connection to a REST data source has been created, data can be selected from tables available to the user's account and then loaded into an app where it can be used in visualizations.
The REST Connector supports the following data types:

• JSON data
• XML data
• CSV files

The REST Connector supports the following authentication methods:

• Windows authentication
• Basic and Digest authentication schema
• X509 certificates

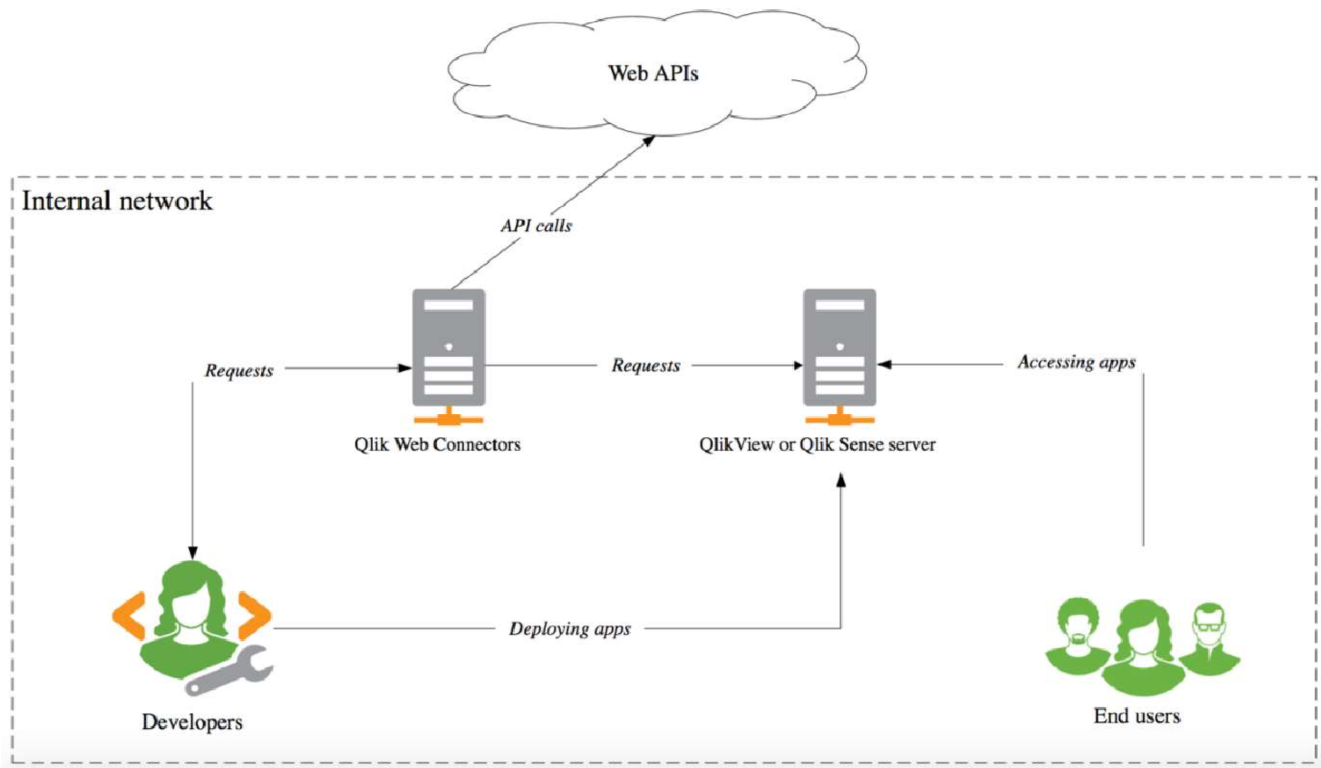

Figure – Qlik Rest connector

5.4. Risk

As GeM portal supports high value transactions so all payments should have audit trail capability.
Audit trail should be enabled for each and every transaction with banks, PFMS, other payment gateways and3rd party integrations.

As average transactions in GeM portal are very high valued, proper logging and monitoring tools should be in place.

5.5. Integration

GeM is envisaged to be faceless API architecture. It promotes ecosystem approach allowing to integrate among various 3rd party applications outside of GeM. Following integrations are required in Phase 1:

- AadhaareKYC – Verify Aadhaar
- GSTN - Verification of GST number
- PAN - Verification of PAN number
- MSME - Verification of UdyogAadhaar number
- MCA21 - Verification of CIN number
- CPP - List down the tenders floated on CPP
- NICSI - Loading of services available on NICSI portal
- PFMS - For payments process for PFMS users
- ePBG - Facilitate vendor to provide online BG
- EMD - Facilitate vendor to provide online EMD
- Payment Gateway - Facilitate buyer to make payment using internet banking
- SGPA - Facilitate buyer to make payment pool account
- CGDA (To facilitate Defence buyer to make payment CDA office)
- Railways/CRIS (To facilitate Railway's buyer to make payment)
- CRPF (To facilitate CRPF buyer to make payment)
- eSign - To perform e-signature on the document generated
- Digilocker - To facilitate the users to share documents from their Digilocker account
- NIC email and SMS gateway to intimate the users

5.6. Security

Security requirements are
- SSO is required
- Top 10 OWASP vulnerabilities need to be covered in application development
- All bid data should be encrypted using Asymmetric algorithms
- Should be STQC compliant

5.7. Hardware Requirements

None

6.Data Migration Requirements

GeM 2.0 users and catalog data needs to be migrated to Gem 3.0.

As part of GeM3.0 implementation, the data from the source system (GeM2.0) will be moved to GeM3.0 for smooth business continuity.

Since the existing GeM2.0 data may not be as exactly fit into the GeM3.0 system, the data migration strategy has to be formulated and finalized.

This document provides an approach for migrating the

- Master data [Parameters like District, Zone, City, Measurement units, Bank, App settings – Refer annexure for the full lists] - Day0 set up as one time
- Static data for the existing User IDs along with their profiles – Supplier, Buyer and GeM Admin, Users and User roles
- Suppliers Organization – Supplier Type, Sellers, Service providers etc
- Buyers Organization – Organization types, Ministries, Departments, Organizations, Divisions, State Departments, Payment Authorities, Bank account details etc
- Products and Catalog – Product specification(TPs), Product images, Product details, Products, Category specifications, Service types, Product categories, Service SLA, Service specification, Service attributes, Service master etc

As a result, the data migration encompasses the following parties to play a critical role:

- GeM SPV / HOST
- GeM MSP & Partners (Intellect Design Arena, Infibeam and NexTenders)

The data migration process is needed for smooth transition of data from the existing GeM2.0 e-market place portal system to the target system GeM3.0. This process will facilitate transfer of data without any loss when it is migrated to the new system and at the same time will ensure the integrity of the data migrated.

The existing data may not exactly fit into the GEM3.0 system, it may need to be transformed, integrated and migrated to the GEM3.0 system. The data migration strategy has to be formulated and finalized.

7. Testing Requirements

There is requirement to provide the testing strategy including the traceability matrix and relevant test cases and conduct the testing of various components of the software developed/customized along with the solution as a whole. The testing should be comprehensive and should be carried out at each stage of development as well as implementation. The MSP shall demonstrate the testing criteria outlined in the table below prior to Go-Live as well as during project operations phase. In case required, parameters might be revised by the client in mutual agreement with the MSP and the revised parameters shall be considered as the acceptance criteria. A comprehensive system should be set up that would have the capability to log & track the testing results, upload & maintain the test cases and log & track issues/bugs identified.

The table below depicts the details for the various kinds of testing activities required for each phase of the project:

Type of testing	Responsibility	Scope of work
System Testing	MSP	1. The MSP shall prepare a test plan as well as test cases and maintain it. The Purchaser may request the MSP to share the test cases and results when required. 2. The testing should be performed through manual as well as automated methods 3. Automation testing tools will need to be provided by the MSP 4. Comprehensive System testing would be performed for each phase of the application development.
Integration Testing	MSP	1. The MSP shall prepare and share with the Purchaser the Integration test plans and test cases 2. The MSP shall perform Integration testing as per the approved plan 3. Integration testing will need to be performed through manual as well as automated methods 4. Automation testing tools will have to be provided by the MSP 5. Integration testing would include all data exchanged between various stakeholders 6. Integration testing would be performed for each phase of the application development.
Performance and load Testing	MSP The Purchaser/ Third Party Auditor (to	1. MSP to do performance and load testing in production setup for Phase-1. After Phase-1, the testing to be performed in a simulated environment arranged by MSP at its own cost. 2. Various performance parameters such as transaction

Type of testing	Responsibility	Scope of work
	monitor the performance testing)	response time, throughput, hits per second and transactions per second etc. should be taken into account. 3. Load and stress testing of the GeM system to be performed on business transaction volume 4. Test cases and test results to be shared with purchaser. 5. Performance testing to be carried out in the exact same architecture that would be set up for production. 6. MSP need to use performance and load testing tool for testing. Purchaser doesn't intend to own these tools. 7. GeM if required, could involve third party auditors to monitor/validate the performance testing. Cost for such audits to be paid by purchaser.
Security Testing (including Penetration and Vulnerability testing)	The MSP The Purchaser/Third Party Auditor (to monitor the security testing)	1. The solution should demonstrate compliance with security requirements as mentioned in the RFP including but not limited to security controls in the application, network layer, cloud, and security monitoring systems deployed by the MSP. 2. The solution shall pass vulnerability and penetration testing for rollout of each phase. The solution should pass web application security testing for the portal and security configuration review of the baseline infrastructure. 3. The MSP should carry out security and vulnerability testing on the developed solution. 4. Security testing will need to be carried out in the exact same environment/architecture as the one set up for production. 5. Security test reports and test cases should be shared with Purchaser 6. Testing tools if required, will have to be provided by the MSP. 7. During the O&M phase, vulnerability assessment and

Type of testing	Responsibility	Scope of work
		penetration testing will need to be conducted on a yearly basis. 8. The Purchaser may also involve third party auditors to perform the audit/review/monitoring of the security testing carried out by the MSP.
User Acceptance Testing of Purchaser System	The Purchaser or Purchaser appointed third party auditor	1. The Purchaser/Purchaser appointed third party auditor will perform User Acceptance Testing after each phase of application development and implementation. 2. The MSP will need to prepare the User Acceptance Testing test cases 3. UAT will have to be carried out in the exact same environment/architecture as the one set up for Production 4. The MSP should fix bugs and issues raised during UAT and seek approval on the fixes from the Purchaser/Purchaser appointed third party auditors before production deployment 5. Changes in the application as an outcome of UAT shall not be considered as a Change Request. The MSP will need to rectify the observations raised. UAT Acceptance Criteria (tentative): Verify all tests planned have been run. Business process works satisfactorily All defects classified with critical and high severity (Sev 1 &Sev 2) have been resolved or technical or procedural workaround has been identified for each individual case with acceptable remaining risk Less than 5% of essential test cases (Sev 3) have not been totally fulfilled, but acceptable technical or procedural workaround has been identified for each individual case with acceptable remaining risks

Type of testing	Responsibility	Scope of work
		▯ Less than 10% of necessary test cases (Sev 4) have not been totally fulfilled, but acceptable technical or procedural workaround has been identified for each individual case with acceptable remaining risks Application SLAs has been meet through manual observation ▯ An implementation of all agreed corrections have been either met or postponed to a mutually agreed date. ▯ The Testing Management Team holds the UAT Exit Meeting and agrees that the UAT has been completed.

Note:

1. The MSP needs to provide the details of the testing strategy and approach including details of intended tools/environment to be used by the MSP for testing in its technical proposal.

2. The MSP must ensure deployment of necessary resources and tools during the testing phases. The MSP shall perform the testing of the solution based on the approved test plan, document the results and shall fix the bugs found during the testing. It is the responsibility of the MSP to ensure that the end product delivered by the MSP meets all the requirements specified in the RFP. The MSP shall take remedial action based on outcome of the tests.

3. All the Third Party Auditors (TPA) will be appointed and paid by the Purchaser directly. The MSP needs to prepare and provide all requisite information/documents to third party auditor and ensure that there is no delay in overall schedule.

4. Post Go-Live, the Production environment should not be used for testing and training purpose. If any Production data is used for testing, it should be masked and it should be protected. Detailed process in this regard including security requirement should be provided by the MSP in its technical proposal. The process will be finalized with the MSP and the Purchaser.

5. The cost of rectification of non-compliances shall be borne by the MSP.

8. System Recovery & Fallback Requirements

Disaster Recovery and Business Continuity: The MSP shall establish policies and procedures to be used for Call Centre systems the event of a disaster to protect and ensure continuation of Call Centre services. An alternate facility has to be provided by the MSP that has the equipment and/or resources to recover the Call Centre business functions affected by the occurrence of a disaster as per the following:

a) At least 25% of the Normal operational status has to be restored within first 24 hours of the disaster.
b) Within 2 days from the day of disaster, the GeM call centre should be operational with 50% operational status.

9. Other Requirements

Mobility services:
The mobility layer encapsulates the mobile enablement framework, which deals with both rendering the web pages in mobile devices through necessary UI components as well as making available native mobile apps of individual services, developed using native mobile components and data security considerations in latest Android and Apple iOS platforms. The mobile apps will be capable of offline data capture and can be installed and used by all the citizens as well as government officials

.Some of the key requirements related to Mobile application, but not limited to, are mentioned below:
i. The Mobile Application should provide an intuitive and user friendly GUI that enables users to navigate and apply actions with ease. The GUI should be responsive with very little or no delays or time lag at launch or whilst navigating through screens.
ii. It should enable ease of configuration and changes to existing GUIs, and support the introduction of new screens.
iii. It should provide on screen tips and online help to aid users while interacting with it.
iv. Should make use of data available in the existing database and reduce duplicate data entry
v. Incorporate analytics into mobile app, to track and identify users experience and actions.
vi. Apps should be easily customizable and easy to Administer data in the GEM database
vii. Network level security, traffic should be encrypted using secured connectivity
viii. Should structure overall content with proper tagging to make them screen reader friendly.
ix. Application should ensure Compatibility with all platforms such as Android & iOS.
x. Solution should develop resolution independent design structure i.e. Mobile Application
should adjust itself automatically as per the screen resolution of the Mobile
xi. Mobile Apps should work flawlessly across different platforms
xii. There should be minimum use flash contents so that home page should be loaded quickly
xiii. It should not occupy excess client's Mobile RAM.
xiv. Should provide Role Based Access control
xv. Should come with mobile threat prevention and recovery system
xvi. Should support authentication using Digital Signature/ e-Sign
xvii. Should have facility to download and upload files, including eForms

10. Acceptance Criteria

Acceptance criteria are defined as per the UAT. Tentative UAT criteria are explained below:

- Verify all tests planned have been run.
- Business process works satisfactorily
- All defects classified with critical and high severity (Sev 1 &Sev 2) have been resolved or technical or procedural workaround has been identified for each individual case with
- acceptable remaining risk
- Less than 5% of essential test cases (Sev 3) have not been totally fulfilled, but acceptable technical or procedural workaround has been identified for each individual case with acceptable remaining risks
- Less than 10% of necessary test cases (Sev 4) have not been totally fulfilled, but acceptable technical or procedural workaround has been identified for each individual case with acceptable remaining risks

Application SLAs has been meet through manual observation

- An implementation of all agreed corrections have been either met or postponed to a mutually agreed date.
- The Testing Management Team holds the UAT Exit Meeting and agrees that the UAT has been completed.

11. Acronyms & Abbreviations

Acronyms & Abbreviations are given in Table 2 below.

Abbreviation	Description
ARX	Authentication and Role based Entitlement Exchange
B2G	Business to Government
BI	Business Intelligence
BRD	Business Requirements Document
CPP	Central Procurement Portal
DDO	Drawing and Disbursement Officer
EMD	Earnest Money Deposit
FRS	Functional Requirements Specification
GCC	Government Community Cloud
GeM	Government e-Marketplace
GFR	General Financial Rules
GSTN	Goods and Service Tax Number
HLD	High Level Design
HoD	Head Of Department
IFSC	Indian Financial System Code
Inote	Inspection Note
IVR	Interactive Voice Response
LLD	Low Level Design
MCA	Ministry of Corporate Affairs
MIS	Management Information System
NIC	National Informatics Centre
NSDL	National Securities Depository Limited
NSIC	National Small Industries Corporation
OEM	Original Equipment Manufacturer
OTP	One Time Password
PAN	Permanent Account Number
PAO	Pay and Accounts Officer
PFMS	Public Financial Management System
PMA	Preferential Market Access
PSU	Public Sector Undertaking
RA	Reverse Auction
RC	Rate Contract
RFP	Request For Proposal
SCM	Source Code Management
SEO	Search Engine Optimization
SGPA	State Gem Pool Account
SLA	Service Level Agreement
SRS	Software Requirements Specification
TP	Technical Particulars
TPA	Third Party Agency
UAN	Universal Account Number
UIDAI	Unique Identification Authority of India
UNSPC	United Nations Standard Products and Services Code
VA	Vendor Assessment