



Dedicated Freight Corridor Corporation of India Limited
(A Government of India Enterprise)

Attachments to Bid Document

IFB No: DFCCIL/IT/SI/2011

Project: Eastern Dedicated Freight Corridor

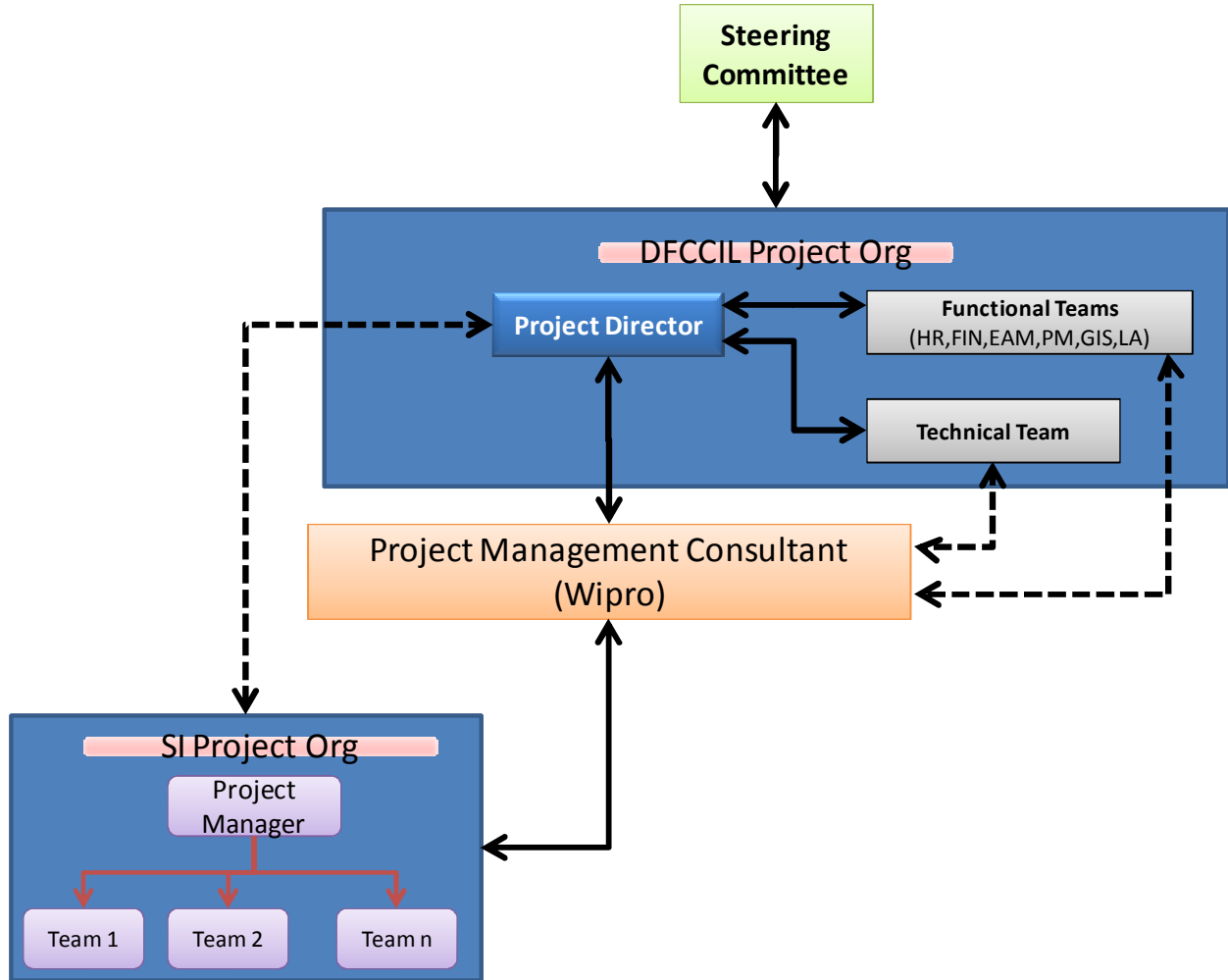
Loan No.: 8066 – IN

**Purchaser: Dedicated Freight Corridor Corporation of
India Limited, India**

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Attachment 1: Project Governance Structure



#	Role	Reporting To	Responsibility
1	Steering Committee	MD – DFCCIL	Setting Strategic Directions Validate Alignment with Business Relationship Health Check Commercial & Contract Review
2	Project Director	Steering Committee	Resource & Capacity Planning Delivery Performance Risk Management Policy Inputs DFCC Team Management
3	DFCC Functional	Project	Providing details of As-Is processes

#	Role	Reporting To	Responsibility
	Teams	Director	Explain functioning of their specific business areas Organize collection of all necessary data Help in finalization of the processes Involvement in UAT Sign off on deliverables and templates and standards Attending training workshops Validate business rules Explain legacy data definition Business validation of data upload during migration
4	DFCC Technical Team	Project Director	Acquire knowledge of system administration & technical issues Facilitate IT related components of the assignment Assist in providing data extracts from the legacy systems Issue Resolution
5	Project Management Consultant	Project Director	Primary interface between SI & DFCC Initiate engagement between DFCC & SI Teams Coordinate the meetings Participate in Steering Committee Meetings Monitor Project progress Quality Monitoring Issue Escalation
6	SI - Project Manager	PMC	Overall responsibility for the project Consortium Management Participating in Steering Committee Meetings Staff allocation and performance Ensuring that project schedules are met Managing the flow of work Coordinating with DFCC for delivery, testing, acceptance schedules Ensuring quality standards, procedures and guidelines for the project Ensuring the quality of deliverables Monitoring manpower and infrastructure resources Planning for and responding to any contingencies Monitoring/reviewing progress of the project Monitoring quality of program/system test
7	SI - Teams	SI - Project Manager	Provide expert advice Identification of deficiencies with respect to Best Practices Development of business process descriptions Suggest solutions to customer based on best business practices Gather customer requirements on Business processes and parameters Determine reporting requirements

#	Role	Reporting To	Responsibility
			Determine forms requirements
			Assist in data transfer mapping
			Develop the required configuration and customization
			Configure the system as per customer requirement
			Conduct tests based on customer defined scenarios
			Conduct implementation and training workshops for process owners and key users
			End user documentation
			Test plan
			Implement the system on the production server

Attachment 2: Technical/Quality evaluation parameters

S. No.	Evaluation Parameter	Focus	Sub section Marks	Reference Forms
Bidder's Understanding and Proposed Approach & Methodology (Maximum Marks: 30)				
1	Bidder's Understanding	<p>Bidder MUST demonstrate:</p> <ol style="list-style-type: none"> its understanding of Purchaser's business context and objectives its understanding of purchaser's Business and Functional processes its understanding of Purchaser's requirement of Integrated IT system to achieve its objectives 	10	
2	Approach & Methodology	<p>Bidder MUST propose: (10 Marks)</p> <ol style="list-style-type: none"> Its approach for Requirement Gathering, Design, Development /Customization and Pre-commissioning Testing of integrated IT solution Highlights and reasons for choosing the Software Package and Hardware Platform Integration methodology including integration with bespoke software packages Industry templates Its approach, Tools & Templates to ensure quality of Deliverables, quick resolution of issues and service quality during Warranty period of the Contract Its approach on utilizing the existing assets of DFCCIL. <p>Bidder MUST submit a REALISTIC Project Plan. (10 Marks)</p> <ol style="list-style-type: none"> The Project Plan MUST state the assumptions made while preparing the Project Plan. The Project Plan MUST be supported with a Staffing Schedule for the Implementation Phase. Bidder MUST propose Change Management Plan, Communication Plan and Training Plan Bidder MUST propose manpower deployment plan for Technical Support and Warranty obligations. 	20	

S. No.	Evaluation Parameter	Focus	Sub section Marks	Reference Forms
		<p>Bidder MUST propose a governance structure clearly describing the reporting and escalation mechanism.</p> <p>Bidder MUST submit a Risk Management Plan</p>		
Proposed Solution (Maximum Marks: 40)				
3	Compliance to Functional Requirement	<p>Bidder MUST demonstrate that the proposed solution stack complies with the functional requirements of the Purchaser.</p> <p>Bidder MUST ATLEAST demonstrate compliance to Functional Requirement Specifications (FRS) described in this Bid Document. The Bidder MUST clearly show fitment of the proposed solution stack to the FRS (line-by-line) under the following heads:</p> <ol style="list-style-type: none"> 1. Directly Met 2. Met with Customization 3. Not met (require custom development) <p>The proposed solution MUST at least meet 70% of the Functionalities (except those of Land Acquisition Information System) Directly or with Minor Customization. Otherwise the Bid would be rendered INELIGIBLE for evaluation. Out of the 20 Marks assigned for this requirement, 0 marks will be given to proposals meeting 70% of the functionality and 20marks will be granted to the best solution among the bids received.</p>	20	Section VII: Forms → 3.5 FRS Compliance Form
4	Non-functional requirement	<p><u>Bidder MUST demonstrate the suitability of the proposed solution for following evaluation point:</u></p> <p><u>Availability: (1 Mark)</u> Bidder MUST demonstrate how it proposes to ensure availability of the applications at the End User level even under peak load conditions.</p> <p><u>Scalability: (1 Mark)</u> Bidder MUST demonstrate how it proposes to cater to the future growth in the number of users.</p> <p><u>Security: (1 Mark)</u> Bidder MUST demonstrate how it proposes to ensure security of the solution on the following fronts:</p>	10	

S. No.	Evaluation Parameter	Focus	Sub section Marks	Reference Forms
		1. Perimeter Security 2. Host Security 3. Application & Database Security <u>Interoperability: (2 Marks)</u> Bidder MUST demonstrate the readiness of the proposed solution for interoperability with future/ external systems. <u>Maintainability: (2 Marks)</u> Bidder MUST demonstrate how it proposes to maintain the solutions. Bidder MUST demonstrate the functionality of the management tools proposed, if any. <u>Low Cost of Ownership: (2 Marks)</u> Bidder MUST demonstrate how the solution and its phasing would result in optimization of investments and Low Cost of Ownership for the Purchaser even after Warranty period of the Contract. <u>Reliability: (1 Mark)</u> Bidder MUST demonstrate the reliability of the proposed solution.		
5	Compliance to Technical Specifications	Bidder MUST ATLEAST demonstrate compliance to various specifications included in this Bid Document	10	Section VII: Forms → 3.6 Specification Compliance Form
Project Team (Maximum Marks: 30)				
6	Project Team	Bidder MUST propose the team which shall be working for the project. Bidder MUST demonstrate the skill set and the experience of the proposed team is apt for the responsibility assigned. Bidder MUST especially focus on the team members who would be responsible for requirement gathering. These members should have sufficient domain knowledge. The CVs of the following would be evaluated for suitability on the basis of relevant experience. <ol style="list-style-type: none"> 1. Project Manager (8 Marks) 2. Team Leaders (One for each Business Application namely GIS, Document & Workflow Management System, 	30	Section VII: Form 3.7.8 Personnel Capability & 3.7.9 Candidate Summary

S. No.	Evaluation Parameter	Focus	Sub section Marks	Reference Forms
		<p>Enterprise Asset Management, Financial Management System, Human Resource Management System, Land Management System, Land Acquisition System) (<u>14 Marks</u>)</p> <p>3. Domain Experts (One each for Construction Project Management, Land Acquisition, Financial Management, Asset Management) (<u>8 Marks</u>)</p>		

Attachment 3: Service Performance Levels

Automated Tool Based Monitoring: Supplier would provide automated tool based monitoring of all performance indices (like application availability, server/SAN availability, application response time etc.) and online reporting system thereof. The tools should have the capability for the client to log in anytime to see the status. Additionally, Supplier will submit regular performance level reports through those automated tools. Supplier has to put in place a complaint logging system (Portal, Voice and E-Mail) for the Help Desk. Reports from the complaint logging system will be used for monitoring SLAs related to Help Desk.

Credit of points: means quarterly payment of that component to be paid after adding all the component’s SLA marks (taken as 100 for Managed IT services)

The classification of complaints for Managed IT Services is as below:

Standard	Users
Crisis	Any user department of the DFCCIL IT system is affected due to non-availability of services
Non-Crisis	Individual Level Complaint (those which have not been marked as Crisis)

Measurement Parameter	Performance Requirement						Basis of Measurement
	Benchmark		Lower		Breach		
	Metric	Credit	Metric	Credit	Metric	Credit	
Service: Managed Service							
Weightage: 30							
Service Window: 0800 hrs to 2000 hrs							
Performance Measurement Window: 0800 hrs to 2000 hrs							
Performance Report Submission Frequency: Monthly							

Measurement Parameter	Performance Requirement						Basis of Measurement
	Benchmark		Lower		Breach		
	Metric	Credit	Metric	Credit	Metric	Credit	
Response Time: Crisis Calls (within 10 minutes)	>= 90% of calls	2	<90% and >=80% of the calls	1	> 80% of calls	-1	Call log details
Resolution Time: Crisis Calls (within 2 hours)	>= 90% of calls	7	<90% and >=80% of the calls	6	> 80% of calls	-2	Call log details
Response Time: Non-crisis Calls (within 10 minutes)	>= 90% of calls	2	<90% and >=80% of the calls	1	> 80% of calls	-1	Call log details
Resolution Time: Non-crisis Calls (within 3 hours)	>= 90% of calls	5	<90% and >=80% of the calls	4	> 80% of calls	-2	Call log details
Backup (99% of scheduled backup)	Up to 2 violations	4	2> & <=4 violations	3	>4 violations	-2	Server logs/EMS
Security Incident Management - Normal Event (not affecting critical components) – within 48 hrs	Up to 3 violations	2	3> & <=5 violations	1	>5 violations	-1	EMS/Server Logs/Call Logs
Security Incident Management - Escalation (Critical production systems affected)- within 24 hrs	Up to 2 violations	2	2> & <=4 violations	1	>4 violations	-1	EMS/Server Logs/Call Logs

Measurement Parameter	Performance Requirement						Basis of Measurement
	Benchmark		Lower		Breach		
	Metric	Credit	Metric	Credit	Metric	Credit	
Security Incident Management - Emergency (Impact health of human being, breach primary controls, total denial of service, unauthorized data access) – within 6 hrs	Up to 1 violation	2	1 > & <=2 violations	1	>2 violations	-1	EMS/Server Logs/Call Logs
Patch Management (within 10 days of patch release)	Up to 2 violations	4	2 > & <=4 violations	3	>4 violations	-2	EMS/Server Logs
Service: Hosting							
Weightage: 40							
Service Window: 24 X 7							
Performance Measurement Window: 0800 hrs to 2000 hrs							
Performance Report Submission Frequency: Monthly							
Business Application Availability	>=95%	20	<95% and >=93%	17	<93%	-3	EMS/Server Logs/Call Logs
Email Availability	>=99%	10	<99% and >=98%	9	<98%	-2	EMS/Server Logs/Call Logs
Enterprise Application Availability	>=99%	10	<99% and >=98%	9	<98%	-2	EMS/Server Logs/Call Logs
Service: Network Performance							
Weightage: 30							

Measurement Parameter	Performance Requirement						Basis of Measurement
	Benchmark		Lower		Breach		
	Metric	Credit	Metric	Credit	Metric	Credit	
Service Window: 24 X 7							
Performance Measurement Window: 0800 hrs to 2000 hrs							
Performance Report Submission Frequency: Monthly							
Network Uptime	>=98.5%	20	<98.5% and >=97%	17	<97%	-3	EMS/Server Logs
Latency (roundtrip CPM and DC)	<80ms (average)	10	<=100ms and >80ms (average)	9	>100ms (average)	-2	EMS/Server Logs

Payments in Warranty Services Phase are to be made on a quarterly basis in an equal 12 installments for a period of 3 years.

Each payment would be linked to the SLAs as described in the illustration below:

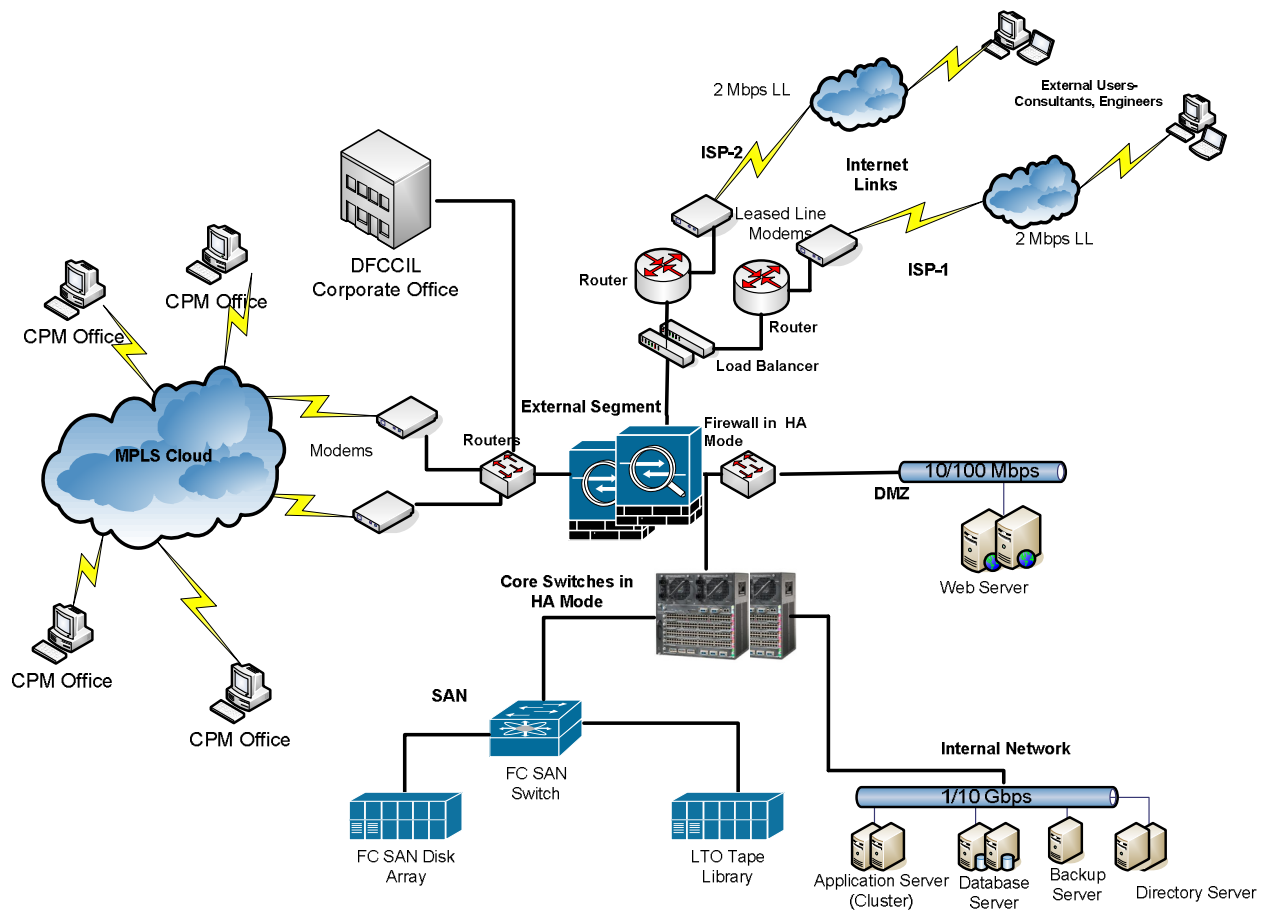
Monthly SLA Performance		
Crisis Type	Condition	Calculated Weight
Managed Service		
Response Time: Crisis Calls (within 10 minutes)	95 % calls were responded within 10 minutes	2
Resolution Time: Crisis Calls (within 2 hours)	92 % calls were resolved within 2 hours	7
Response Time: Non-crisis Calls (within 10 minutes)	99% calls were responded in 10 minutes	2
Resolution Time: Non-crisis Calls (within 3 hours)	85 % calls were resolved within 3 hours	4
Backup (99% of scheduled backup)	No violations reported	4

Security Incident Management - Normal Event (not affecting critical components) – within 48 hrs	Two violations reported [<i>Note: the specific incidents will be described</i>]	2
Security Incident Management - Escalation (Critical production systems affected)- within 24 hrs	No violations reported	2
Security Incident Management - Emergency (Impact health of human being, breach primary controls, total denial of service, unauthorized data access) – within 6 hrs	No violations reported	2
Patch Management (within 10 days of patch release)	3 violations reported [<i>Note: the specific incidents will be described</i>]	3
Total Credits for Managed Services		28
Hosting		
Business Applications Availability	88.9 % of the time the Business Applications were available [<i>Note: the specific incidents will be described</i>]	-3
Email Availability	90% of the time email services were available [<i>Note: the specific incidents will be described</i>]	-2
Enterprise Application Availability	98% of the time Enterprise Applications were available [<i>Note: the specific incidents will be described</i>]	9
Total Credits for Managed Services		4
Network Performance		
Network Uptime	98% of the time network was available [<i>Note: the specific incidents will be described</i>]	17
Latency (roundtrip CPM and DC)	Average reported was 10 ms	10
Total Credits for Managed Services		27

Grand Total (out of 100)	59
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Attachment 4: Envisaged Network Architecture

The technical architecture envisaged for DFCCIL is centralized. The data processing shall be carried out at a single location with a set of servers to support the processing needs of the DFCCIL. The architecture should be designed so as to avoid the single point failure to the extent possible. Central location needs to be connected to the various offices through different network components. A specialized cell shall manage the centralized computing environment. Following is the logical representation of the architecture however; the bidder may propose a better architecture to meet the DFCCIL requirements.



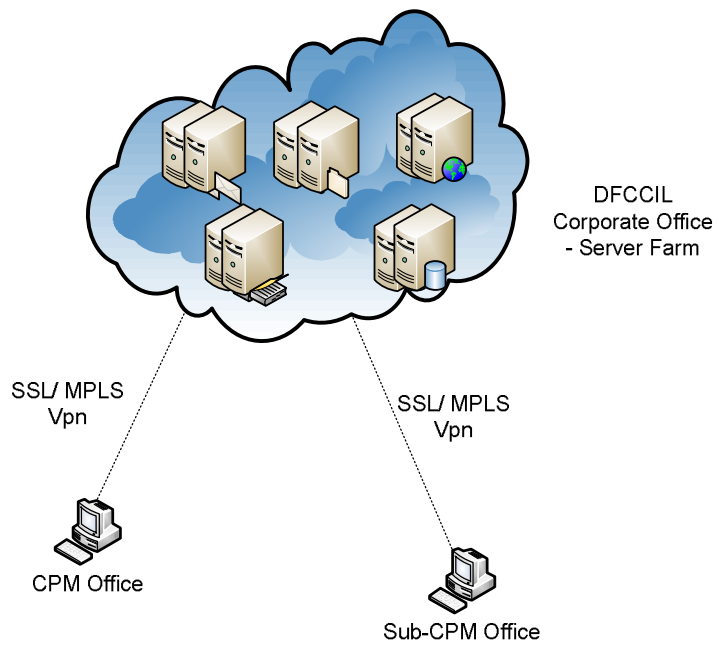
Users of the envisaged system can be categorized as below:

Users	Usage	Description
DFCCIL employees at Corporate Office / Remote CPM / Sub-CPM offices/ Field Units	DFCCIL employees	Role-Based-Access to DFCCIL applications
DFCCIL IT administration zone	DFCCIL IT department staff	Additional access to servers to perform routine tasks on servers or diagnose/ intervene in case of failure of a system.
External personnel	Contractors, consultants or any external bodies such as Railway Board, World Bank etc.; which form part of the DFCCIL ecosystem.	Limited access, to mitigate data leaks and virus propagation as well. Credentials must be granted on an individual case basis via portal only.
Remote Internet users	DFCCIL employees with a temporary need to access the portal from the construction sites	Access similar to DFCCIL HQ users, but data has to be encrypted via VPN technology. An additional login has to be required at the firewall level and usage logged to detect suspicious activity in the network area

The recommended network design must be a star architecture, with the headquarters in the centre and no direct connectivity within CPM sites is envisaged.

The definition and logical delimitation of the user groups is crucial to allow support and deployment of security rules and policies.

The network break-down takes into consideration both functional activities and geography of the areas. For these reasons, the network areas has to be segregated in different VLAN (level 2) and IP Subnets (level 3) to ensure sound support and fast deployment of security rules as being shown in the following diagram:



Attachment 5: Application wise User breakup

Application →	Financial Management System				Human Resource Management System				HRMIS (Self Service)				Project Management System				Land Acquisition Information System				GIS				Enterprise Asset Management			
Year → User Type ↓	Y1	Y2	Y3	Y4	Y1	Y2	Y3	Y4	Y1	Y2	Y3	Y4	Y1	Y2	Y3	Y4	Y1	Y2	Y3	Y4	Y1	Y2	Y3	Y4	Y1	Y2	Y3	Y4
U1	10	10	10	10	10	10	10	10	80	90	100	110	20	20	20	20	10	10	10	10	20	20	20	20	0	5	5	5
U2	14	14	14	14	0	0	0	0	84	84	98	112	28	42	56	56	28	28	28	28	28	42	56	56	0	14	14	14
U3	0	0	0	0	0	0	0	0	0	0	0	0	14	28	56	70	0	0	0	0	0	0	0	0	0	0	0	0
U4	0	0	0	0	0	0	0	0	0	0	0	0	14	28	56	70	0	0	0	0	0	0	0	0	0	0	0	0
Total	24	24	24	24	10	10	10	10	164	172	198	222	76	118	188	216	38	38	38	38	48	62	76	76	0	19	19	19

#	User Type	Description
1	U1	HQ
2	U2	CPM
3	U3	External (Independent Engineer)
4	U4	External (Contractor)

Y1	Y2	Y3	Y4
2012	2013	2014	2015

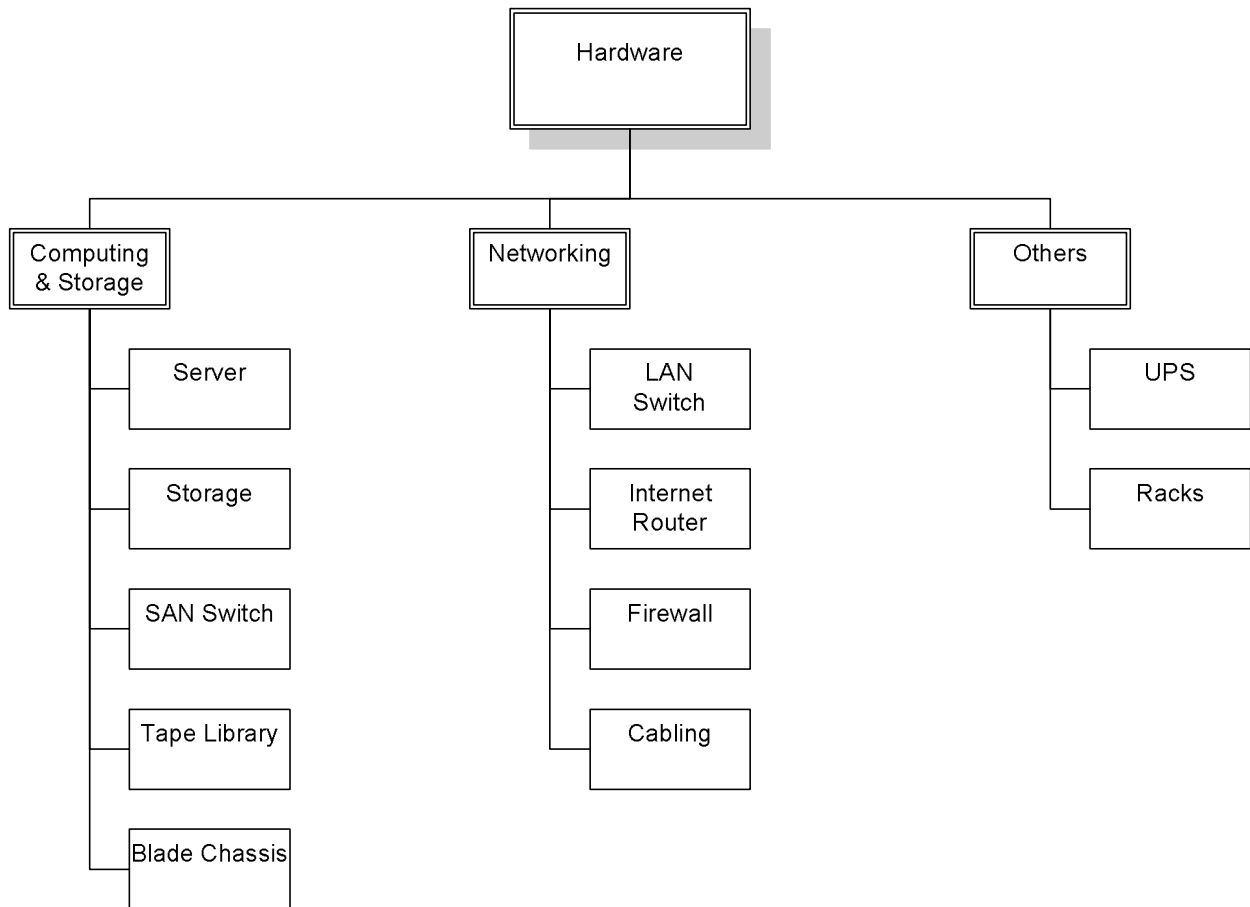
Attachment 6: Usage of Digital Signature

#	Type of Documents	Signing Authority	Number of required Digital Signatures
1	Tender WO	GGM/ GM	27
2	Tender PO	GGM/ GM	
3	Design Document	GGM/ GM	
4	Measurement book	GGM/ GM	
5	Tax Return	DF and MD	2
6	Company Accounts	DF and MD	
7	---	Company Secretary	1

Attachment 7: CPM Office Locations

Sl.No.	Unit	Address
1	Mumbai	7th Floor, New Administration Building, DN Road, Mumbai-400001
2	Vadodara	No.13-14, 3rd Floor, Panorama Complex, R.C. Dutt Road Alkapuri, Vadodra
3	Surat	Arun's-1, 4th Floor, Piplod Dummas Road Near ISCON Mall Surat – 395007
4	Ahmedabad	1st Floor, Old DRM Office Building, Kalupur Ahmedabad
5	Jaipur	B-12, Hanuman Nagar Opp Metro Hospital, Sirsi Road Jaipur 302021
6	Ajmer	42 A/3 Civil Lines Ajmer 305001
7	Rewari	A – 102, Star House Sector 4, Noida
8	Meerut	4/54, Raksha Puram, Mawana Road, Meerut, Uttar Pradesh
9	Allahabad/East	18-B, Nyaya Marg, Ashok Nagar, Civil Lines Allahabad 211001
10	Allahabad/West	328/115, Ashok Nagar Allahabad 211001
11	Kanpur	117/455, Block H, Pandu Nagar, Near JK Temple, Kanpur - 208005
12	Ludhiana	61A, 1st Floor, Sarvodaya Colony, Pakholwal Road, Ludhiana
13	Mughal Sarai	213, MP Ravi Nagar Mughalsarai 232101
14	Dankuni	18/L, Ground Floor, New Alipore, Kolkata - 700053

Attachment 8: Minimum Envisaged Hardware Components



Attachment 9: Minimum Bill of Quantity

For “4.2 System Inventory Table (Supply and Installation Cost Items)”

Sl. No.	Item	Number
1.	Server (RISC/ EPIC) Architecture	2
2.	SAN Switch	2
3.	SAN Storage	1
4.	Tape Library (with Media for project period)	1
5.	Internal Firewall	2
6.	External Firewall	2
7.	Internet Router	2
8.	Access Switch	2
9.	Distribution Switch	2
10.	DMZ Switch	2
11.	Rack	4
12.	KVM Switch	2
13.	UPS 60 KVA	2

For “4.3 System Inventory Table (Recurrent Cost Items)”

Component No.	Component	Year1 ^{1,2}	Year2	Year3
1.	Hardware Maintenance	Incl. in Warranty	Incl. in Warranty	Incl. in Warranty
2.	Software Licenses and Updates:			
2.1	System and General-Purpose Software	Incl. in Warranty	all items, all sites	all items, all sites
2.2	Application, Standard, and Custom Software	Incl. in Warranty	all items, all sites	all items, all sites
3.	Managed Services			
3.1	Network Admin	All working days	All working days	All working days

¹ The Year consists of 12 months starting from the date of issuance of Operational Acceptance Certificate.

² Subsequent years begin after completion of previous year

Component No.	Component	Year1^{1,2}	Year2	Year3
3.2	System Admin	All working days	All working days	All working days
3.3	Database Admin	All working days	All working days	All working days
4.	Bandwidth
5.	Digital Signatures

Attachment 10: Indicative Specification: Computing Hardware

There shall be two types of servers:

1. RISC/ EPIC architecture based server
2. X86/ Equivalent architecture based server

Critical functions such as those mentioned in the following table shall be hosted on RISC/ EPIC architecture based server.

S. No	Server Functions	No. of Cores
1	Database Server	6
2	Portal Server	2
3	Application Server	6
4	LDAP/AD Server	1
5	Enterprise Content Management Servers	2
6	Testing Server	2
7	GIS Server	2
8	Backup Server	1
Total		22

The Supplier needs to provision 1:1 redundancy in the number of physical servers for the above mentioned requirement. Indicative specifications for the above mentioned server requirement is detailed in the table below.

Indicative Server Specification: RISC/ EPIC Architecture based Server

Specification	
Product Type	Mid-Range Server, Enterprise Class
Form Factor	Rack/Blade
Platform	UNIX/Windows
Architecture	RISC/EPIC
Processor	Should be latest at the time of bidding
Processor Cores	22 scalable to 32
Cache	As per OEM Architecture
Memory	8 GB per core scalable upto 16GB per core
Memory Type	DDR3 SDRAM
Others	This Machine should be scalable through inbox or modular upgrade; Capable of dynamic movement of resources (CPU/ memory/adapters) across partitions

The Supplier needs to size separately for EMS, Mail and Antivirus servers etc. These servers shall be hosted on x86/ equivalent platform. The Supplier needs to decide the appropriate level of physical server redundancy.

1. Storage

Description	Specification
Make And Model	To be specified by the vendor
Architecture	End to End 4Gb/s
Controller cache	Total 4 GB cache with 72 Hr battery backup
Host Ports	8 x 4Gb/s Host Ports
RAS Features	Dual redundant RAID controllers
	Dual redundant Power Supplies
	Dual redundant Fans
	Hot Swappable Bays and Disks
Max Drives Supported	Up to 112 drives supported
RAID Level required	RAID 5
Required Storage	4TB Usable using FC Disks
	4TB Usable using SAS Disks
OS Support	Windows, Linux, AIX, HP-UX, Solaris
Licenses	Licenses for Snapshot/ Volume Copy
Compliance	RoHS and NEBS
RAID Levels Supported	0, 1, 0+1, 5, ,6
Features	Supports 4/2/1 Gb/s Host Interface Link speed
	Switched Drive Module Type
	Solid RAS cabling
	Single Common Array Manager

2. SAN Switches – 2 Qty

4 GBPS Switches, 36 ports or more & relevant S/w with Licenses for integration of Servers with Storage

3. Tape Library

Description	Specification
Make And Model	To be specified by the vendor
Drive Type	LTO Generation 4 Full Height
Drives	2
Drive throughput	120 MB/s
Native capacity	19.2 TB
Interface	4 Gb/s Native FC
RAS Features	Hot-swappable drives; Ethernet and serial ports for diagnostics and reporting; redundant hot-swappable power supplies with redundant fans
Supported Host Platform	HP-UX, AIX, Linux, Solaris, Windows
Bar-coded 50 LTO4 Media Cartridges with one set of cleaning Cartridges (to be supplied with Library)	

4. Blade Chassis

Description	Specification
Chassis	The Blade Chassis should be configured with minimum 10 Nos. of Blades. Accordingly the No. of Chassis to be quote with interoperability
	Support for Quad CPU and Dual CPU blades in the same enclosure
	Same enclosure should support Intel Xeon/AMD Opteron/RISC/EPIC based blades
	Should support simultaneous housing of Ethernet, FC, iSCSI, offering Hot Pluggable & Redundancy as a feature for the mentioned I/O devices
Management Module	System Management Port to allow simultaneous management access of multiple Blade Servers in the Chassis. GUI, console-based deployment server to set up multiple OS and application configurations

Description	Specification
Power Modules	The enclosure should be populated fully with power supplies of the highest capacity available with the vendor. Power supplies should support N+N or N+1 redundancy configuration
	Should offer choice of a single phase or 3 phase power subsystem for flexibility in connecting to datacenter power enabled with technologies for lower power consumption
	Guaranteeing complete availability even on failure of any 2 power units across the enclosure.
Cooling	Each blade enclosure should have a cooling subsystem consisting of redundant hot pluggable fans or blowers enabled with technologies for improved power consumption and acoustics
Management Software	Should be able to perform comprehensive system data collection and enable users to quickly produce detailed inventory reports for managed devices. Software should save the Reports for further analysis.
	Should provision for a single console to monitor multiple enclosures
	Should support simultaneous remote access for different servers in the enclosure
	Management Software Licenses for a fully populated Blade Enclosure should be given
	The software should provide Role-based (admin, user, operator, etc) security which allows effective delegation of management responsibilities by giving systems administrator's granular control.
	The management software should provide proactive notification of actual or impending component failure alerts. Should support automatic event handling that allows notification of failures via e-mail.
	Should be able to perform comprehensive system data collection and enable users to quickly produce detailed inventory reports for managed devices. Software should save the Reports in some format for further analysis.
	Should help to proactively identify out-of-date BIOS, drivers, and Server Management agents and enable the remote update of system software/firmware components.

Description	Specification
	The server performance monitoring software should be able to detect, analyzes, and explain hardware bottlenecks. Also it should be able to log the data over time and allow it to replay the same in a short time frame for performance analysis.
	The Deployment software should provide for User friendly GUI/ console-based deployment to set up and install multiple OS and application configurations in individual blade server.
	The blade system should have the capability of managing all the blades in the Enclosures simultaneously capable of monitoring both physical and virtualized environments with single signon capability for all devices in the enclosure

Attachment 11: Indicative Specifications: UPS & Rack

5. UPS for Data centre (Min. 30KVA)

S. No.	Specifications
1	UPS system is required to feed clean and uninterrupted Power Supply to the critical and sensitive load. Power supply system should be designed and engineered such that it enhances the life of the equipment / instruments / computer systems / network devices, etc. installed in the Data Center Facility. It should not under any condition harm the quality of operation of these devices / systems.
2	UPS system shall ensure safe shutdown of the systems / equipments / instruments / controls in case of no-mains condition.
3	The System shall be designed and integrated with the other Facility systems such that it provides fail safe operations of the systems under no-mains / no-power conditions and /or the abnormal operating conditions such as fire, theft, intrusion, etc.
4	Vendor to check and confirm the space available for installation, operation and maintenance of the UPS system including panels, transformers, Distribution Panels / Boards, Batteries, etc. offered.
5	The UPS System shall be true on-line, PWM IGBT based, fully double conversion type and of suitable power capacity.
6	UPS System shall be with three phase input and three phase output, with proper overload capacity, voltage regulation, transient response, indications, meters, protections, cooling, bypass static switch and remote indication facility.
7	The UPS shall have separate battery set having battery back up to support full load of UPS for 180 minutes. The battery set shall be Sealed Maintenance Free (SMF) either Lead Acid category or VRLA type.
8	UPS System shall provide regulated and uninterrupted three phase A.C. power, within specified tolerances for deriving power for servers, computers, firewall devices, network equipments and other critical loads during normal and emergency operation.

S. No.	Specifications
9	The system shall be installed indoor in a clean atmosphere. However, design must consider UPS operation without any deterioration under abnormal atmospheric condition or abnormal condition of A/C system operation.
10	UPS system shall be designed for satisfactory and well-coordinated operation with other related equipment as well as input and output systems.
11	Energizing or de-energizing any portion of the system serviced by the UPS shall not cause output changes that can affect the operation or integrity of the remaining portions of the system in any way.
12	The equipment shall have self-protecting design against all A.C. and D.C. transients, voltage surges, and steady state abnormal voltages and currents.
13	The circuit protection shall be coordinated with UPS short circuit capacity and protective device characteristics so that a fault on any circuit shall result in minimum loss of function.
14	All non-interrupting components of UPS system shall be capable of withstanding the resultant short circuit current without damage.
15	All circuit interrupting components shall be capable of withstanding and interrupting the resultant short circuit currents without damage.
16	The charger shall be designed to get maximum life and health (as guaranteed by the battery manufacturer) of the batteries connected to it.
17	For continuous operation at specified ratings, temperature rise of the various components of UPS system shall be limited to the permissible values stipulated in the relevant standards and/or this specification.

6. Server Racks

The racks should be from the same OEM as that of servers / storage

7. Network Racks

S. No.	Specifications
1	Should be EIA compliant
2	Should have proper cable management
3	Provision for tool-less installation of cable spool
4	Floor Mounted Free Standing rack along with Cable Manager
5	AC Distribution Box
6	Accessories & Screws
7	Cooling Fans

Attachment 12: Indicative Specifications: LAN Equipment & Cabling

1. LAN Switch for CPM Offices

Particulars	Specifications
Make And Model	To be specified by the vendor
Interface /Slots	1 x 8/24 ports 10x100 FE (depending on the location and layout of CPM Office)
VLAN features	IEEE 802.1Q VLAN encapsulation
	Dynamic Trunking Protocol (DTP) or equivalent
	Minimum 255 VLAN
Management	
	RS-232 Console port
	Accessibility using Telnet, SSH, Console access.
	SNMPv1, snmpv2/v3
Standards	
	IEEE 802.1x support
	IEEE 802.3x full duplex on 10BASE-T and 100BASE-TX ports
	IEEE 802.1d Spanning-Tree Protocol
Power Supply	
	Internal power supply 230 Volt 50Hz input
Miscellaneous	
	All necessary power cords, adapters, data cables, connectors, CDs, manuals, brackets accessories, wire managers, etc. should be provided

2. Cat 6 UTP Cable

- 23/24 AWG Annealed bare solid copper, 350 MHz CAT-6 UTP Cable
- Meets EIA/TIA 568-B.2-1 Category 6 specifications, Passed UL 444 test and meets CM and CMR ratings
- Worst Case Cable Skew: 45 nsec/100 meters
- Characteristic Impedance: 100(+/- 3) Ohms 250MHz, Tested till 600 MHz
- Conductor Annealed copper wire Diameter 0.52 mm (nominal)
- Insulation High Density polyethylene, Diameter 0.94 mm (nominal)
- Support for Fast Ethernet and Gigabit Ethernet IEEE 802.3/5/12, Voice, ISDN, ATM 155 & 622 Mbps, Broadband
- DC Resistance Max: 6.6 Ohms/100m
- UL, ETL and 3P verified to "ANSI/TIA/ EIA-568-B-2.1" specifications
- Standard length: 305 Meters (1000 ft.)
- Product must be UL Listed and ETL verified.
- Component Level "Zero-bit error test" verified and tested by ETL.

3. Cat 6 UTP Jack Panel

- Modular, Keystone type Unshielded Twisted pair, category 6, EIA/TIA 568-B.2-1
- The cross connect modules are fire-retardant, molded plastic modules UL94 VO rated, consisting of horizontal index strips for ease of re-termination.
- 110 IDC Termination, allowing wires between 22 – 26 AWG sizes.
- Meets or Exceeds EIA/TIA – 568 – b.2-1 Category 6 connecting hardware specification
- RJ45 (8P8C) T568A/T568B colour coding termination.
- Cable Guide way to guide the cable on the rear side
- 1U size for 24 Ports
- Product must be UL Listed and ETL verified.

4. Cat6 UTP Patch Cord

- With matching colored snag-less, elastomer polyolefin boot
- Terminals with gold contacts, 50 micron" gold over nickel
- Patchcord has a characteristic impedance of 100 +/- 3 Ohms
- Patchcord has extra long boot to maintain the bend radius.
- Assembled with short body RJ45 50u gold plate to minimize untwist pair length.
- Designed for high speed
- Full-duplex parallel transmission
- Improved PS -NEXT, ELFEXT and Return Loss performance

- Back-ward-compatibility with all current Cat.5 products and applications
- Guaranteed full duplex Crosstalk values
- Product must be UL Listed and ETL verified.

Attachment 13: Indicative Specifications: WAN Equipment

1. Internet Router

Particulars	Specifications
Make And Model	To be specified by the vendor
Hardware Architecture	<ul style="list-style-type: none"> • 19" Rack mountable • Should support IP, MPLS etc. • All the modules, power supply should have support for hot swappable functionality. • Should have redundant CPUs and separate data/ forwarding and control/routing planes • On-line insertion and removal for cards • Modular Chassis • Router performance should be minimum of 400 Kpps • Power supply for 230 V AC 50 Hz with Redundant power supply
Interface / Slots	<ul style="list-style-type: none"> • Ethernet Port 2 - 10/100/1000 Mbps • Channelized E-1 Ports - 4 • Should support minimum 8 service slots • Shall support variety of interfaces like E3, Ch-E1, E1 G703, Metro Ethernet Interfaces as per ITU-T Standard. • Serial V.35 Interfaces: 4 ports • 4 empty slots • Console port : 1 numbers
Security	<ul style="list-style-type: none"> • GRE and IP Sec 3DES/AES VPN for configuration of VPN tunnels. • Support for IPSEC Site-to-Site and Remote Access VPNs. Should provide a hardware assisted IPsec 3DES encryption performance up to 150Mbps. • NAT, PAT • Access control - Multilevel • Support ACL's to provide supervision and control. • Multiple Privilege Levels for managing & monitoring

Particulars	Specifications
	<ul style="list-style-type: none"> • Support for Remote Authentication User Service (RADIUS) and AAA • Support for Standard Access Lists to provide supervision and control. • Controlled SNMP Access using ACL on router to ensure SNMP access only to identified NMS/EMS • PPP CHAP support. PAP (optional) • DoS prevention through TCP Intercept & DDoS protection
Routing Protocols	<ul style="list-style-type: none"> • Static Routes • RIPv1, RIPv2, RIPv3 • OSPFv2 and v3. • BGP, IS-IS • Route redistribution between any of the above protocols <p>Protocols</p> <ul style="list-style-type: none"> • PPP, Multi-link PPP • Load Balancing Protocol • Support for URL Filtering • IPv4, IPv6 • MPLS L2 & L3 • VRRP / HSRP • Shall support IPv6 features: DHCPv6, IPv6 QoS, IPv6 Multicast support, • Bidirectional PIM, Multicast VPN, PIM SSM (Source Specific Multicast), IPv6 • PIMv2 Sparse Mode, IPv6 PIMv2 Source-Specific Multicast • MPLS Features: MPLS VPN, MPLS (mVPN (Multicast VPN), VRF-Aware • Services (NAT, FW, IPsec, Syslog), Carrier Supporting Carrier (CsC), • DiffServ Tunnel Modes, MPLS TE, DiffServ-Aware TE, Inter-AS VPNs
Congestion	<ul style="list-style-type: none"> • Random Early Detection • Weighted Fair Queuing • Priority Queuing
IP Multicasting	<ul style="list-style-type: none"> • IGMPv1&v2, PIM-SM, PIM-DM or MOSPF

Particulars	Specifications
Management	<ul style="list-style-type: none"> • Accessibility using Telnet, SSH, Console access. • Software upgrades using FTP, TFTP, etc. • SNMP Support for v1, v2 , v3
Debug & Diagnostics	<ul style="list-style-type: none"> • Display of input and output error status on all interfaces • Display of Dynamic ARP table • Display of physical layer line status signals like DCD, DSR, DTR, RTS, CTS on all interfaces. • Should have support for SLA monitoring for metrics like delay, latency, jitter, packet loss, and MOS • Trace-route, Ping, extended PING

2. External Firewall

#	Specification
Make And Model	To be specified by the vendor
a.	<ul style="list-style-type: none"> • Firewall throughput: 1 Gbps
b.	<ul style="list-style-type: none"> • Max connections: 600,000 • New connections: 10,000 per second
c.	<ul style="list-style-type: none"> • Interfaces: 4 Giga Ethernet in the appliance, scalable to 8 GE
d.	<ul style="list-style-type: none"> • High Availability: Active-standby, Stateful failover
e.	<ul style="list-style-type: none"> • Firewall features: • Routing Protocols • Static Routes • RIPv1, RIPv2 • OSPF • Protocols • TCP/IP, PPTP • RTP, L2TP • IPSec, GRE, DES/3DES/AES • PPPoE, EAP-TLS, RTP • FTP, HTTP, HTTPS • SNMP, SMTP • DHCP, DNS • Support for IPv4 , IPv6 • Real-time, secure, embedded OS • Application inspection for DNS, FTP, HTTP, ICMP, MGCP, SMTP, SIP etc. • VLAN support: 100 • Routing: Static route, RIPv2, OSPF etc. • Translation: NAT and PAT • BOTNET filter support • Standard and extended ACL's on all ports • AAA and RADIUS authentication / TACACS
f	<ul style="list-style-type: none"> • Standard • IEEE 802.1s • IEEE 802.1w

#	Specification
	<ul style="list-style-type: none"> • IEEE 802.1x • IEEE 802.3ad • IEEE 802.3af • IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports • IEEE 802.1D Spanning Tree Protocol • IEEE 802.1p CoS Prioritization • IEEE 802.1Q VLAN • IEEE 802.3 10BASE-T specification • IEEE 802.3u 100BASE-TX specification

3. Internal Firewall

#	Specification
Make And Model	To be specified by the vendor
a.	<ul style="list-style-type: none"> • Firewall throughput: 700 Mbps
b.	<ul style="list-style-type: none"> • Max connections : 200,000 • New connections: 10000 per second
c.	<ul style="list-style-type: none"> • Interfaces: 4 Giga Ethernet
d.	<ul style="list-style-type: none"> • High Availability: Active-standby, stateful failover
e.	<ul style="list-style-type: none"> • Firewall features: <ul style="list-style-type: none"> • Real-time, secure, embedded OS • Application inspection for DNS, FTP, HTTP, ICMP, MGCP, SMTP, SIP etc. • VLAN support: 100 • Routing: Static route, RIPv2, OSPF etc. • BOTNET filter support • Translation: NAT and PAT • Authentication and accounting: AAA RADIUS / TACACS

4. MPLS Router – Data Center

#	Specification
1	Router Architecture requirements
	Modular hardware architecture of the chassis
	Support at least 6 interface card slots
	Support for multiple interface types within each slot (mix and match of LAN, WAN interfaces)
2	Security Features:
	The router should support hardware-based encryption techniques.
	The router should support encryption acceleration capabilities using encryption methods such as DES, 3DES and AES
	The router should support security features such as advanced firewall, L2TP, MPLS and IPsec VPNs. SSHv2 and SNMPv3 protect router management sessions
	The router should support the following tunnels:-
	· IPv6 to IPv4 Tunnel Manual(Point to Point)
	· IPv6 to IPv4 Tunnel Auto(Point to multi Point)
	· ISATAP(Point to Point)
	· IPv6-over-IPv4 GRE
	· IPv4-over-IPv4 GRE
	· GRE
3	High Availability Requirements
	The router should support redundant PSU
	Hot swapping of interface module, power supply.
	Support for standards based VRRP to ensure standby operation of routers
	Graceful Restart of following Routing protocols: OSPF/BGP/IS-IS/ LDP/RSV
4	Performance Requirements
	The chassis should support min 1.2 Mpps of throughput
5	Multicast Support
	Multicast support using Multicast routing protocols like PIM-SM,DM,IGMP V2/V3
	Should support Multicast VPN capabilities over MPLS backbone
6	Routing Protocol support
	The router should support the following L3 protocols:- Static Route / RIP / OSPFv2 / IS-ISv2 / BGPv4 / RIPng / OSPFv3 / IS-IS for IPv6 / BGPv4+
7	Interface support requirement specifications
	The router should support Analog and digital Voice modules with CODECs types namely G.711A law, G.711U law, G.723R53, G.723R63, G.729a, G.729R8
	Support for interfaces Channelised E1, Channelised STM-1, Channelised E3, FE and GE
	Support for transport of IP over ATM, Frame Relay, HDLC and PPP encapsulations

#	Specification
8	MPLS Capabilities
	<ul style="list-style-type: none"> • L2VPN: Martini, Kompella • MPLS TE and RSVP TE • Multicast VPN
9	Management & Maintenance
	<ul style="list-style-type: none"> • Configuration through command line or console port • Configuration and remote maintenance via Telnet (Ethernet port) and Modem dial-up (AUX port) • Manage through SNMP (v1, v2c and v3) • RMON (1, 2, 3 and 9 groups of MIB) • System log • Layered alarms • PING and Tracert
10	Interface requirement
	3 Gig Ethernet port
11	All necessary cables, software, manuals should be provided along with the router.

5. DMZ Switch

#	Specification
1	Port density in each switch
	24 x 10/100/1000 Base T ports with 4 Gigabit SFP ports (Combo)
	Should have atleast 4 ports of 10 Gbps Uplinking port
2	Switching capacity
	Atleast 128 Gbps Switching Capacity
	Forwarding Rate based on 64 byte packets - Atleast 95 Mpps
3	MAC Address Support
	32,000 MAC address
4	VLAN support
	IEEE 802.1Q VLAN - 4000 VLANs
	Layer 3 features like RIP v1/V2 , OSPF, BGP, OSPF v3, BGP4+, RIPng
5	Management
	Web View, Telnet, SNMP, Console, RMON
6	Availability & Scalability
	IEEE 802.1w Rapid Spanning Tree Protocol
	Support 12 or more STP instances
	Support closed loop stacking with min aggregate 40Gbps stack bandwidth
7	Support LLDP
	Internet Group Management Protocol (IGMP) snooping
	Support redundant power supply
8	QOS
	802.1p prioritization

#	Specification
	L2, L3, L4 (TCP/UDP) traffic classification
	Strict priority queuing, round-robin Queuing and Rate Limiting
	Broadcast, multicast traffic control
9	Technology support
	IEEE 802.1s, IEEE 802.1w, IEEE 802.1x, IEEE 802.3ad
	IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX and 1000BASE-T ports
	IEEE 802.1D Spanning Tree Protocol
	IEEE 802.1p prioritization, IEEE 802.1Q VLAN
	IEEE 802.3 10 BASE-T specification
	IEEE 802.3u 100 BASE-TX specification
	IEEE 802.3ab 1000BASE-T specification
	IEEE 802.3z 1000BASE-X specification
	IGMP v1 & v2; IPv4
10	Security
	802.1x-EAP
	Shall be TACACS+ /RADIUS enabled
	ACLs/Filters based on source and destination MAC addresses, IP addresses or TCP/User Datagram Protocol (UDP) ports, Time based ACL.
	Multilevel security on console access
	SSHv2, SNMP v3

6. CPM MPLS Router

#	Specification
1	Router Architecture requirements
	Must have at least 5 interface slots
	Should have at least 2 Gigabit Ethernet interfaces.
	Should have a throughput minimum of 300Kpps.
2	Following WAN Protocols must be supported: -
	PPP and Multilink PPP (MP),
	PPPoE client and server,
	PPP/MP over Frame Relay,
	Frame Relay and Multilink Frame Relay (MFR),
	HDLC,
	Lan Protocol
	IEEE 802.3x VLAN
	IEEE 802.1P
	IEEE 802.1Q
	IEEE 802.3ad LACP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
3	Security:
	Port-based: PPPoE client and server, portal, IEEE 802.1X;

#	Specification
	AAA: local authentication, RADIUS, TACACS;
	Application Specific Packet Filtering
	Data security: IKE, IPSec, encryption (DES, AES, 3DES), portal;
4	Should support following VPN functionalities:-
	Generic Route Encapsulation (GRE)
	Layer 2 Tunneling Protocol (L2TP)
	Dialup Virtual Private Network (DVPN)
	IPSEC
5	Should support following QoS functionalities:
	Traffic classification
	Traffic policing
	Traffic Shaping
	Congestion Management
	Congestion Avoidance
	Frame Relay Qos
	MPLS QoS
	MP QoS,
	ATM QoS
	Subinterface Qos
	cRTP/IPHC
6	Memory support:
	At least 256 Mb SDRAM and should be scalable to 1 GB
	256 Mb Flash Memory
7	Management:
	SNMP v1, 2c, 3
	Standard and Enterprise MIBs
	Telnet
	SSH
	Syslog
	RMON

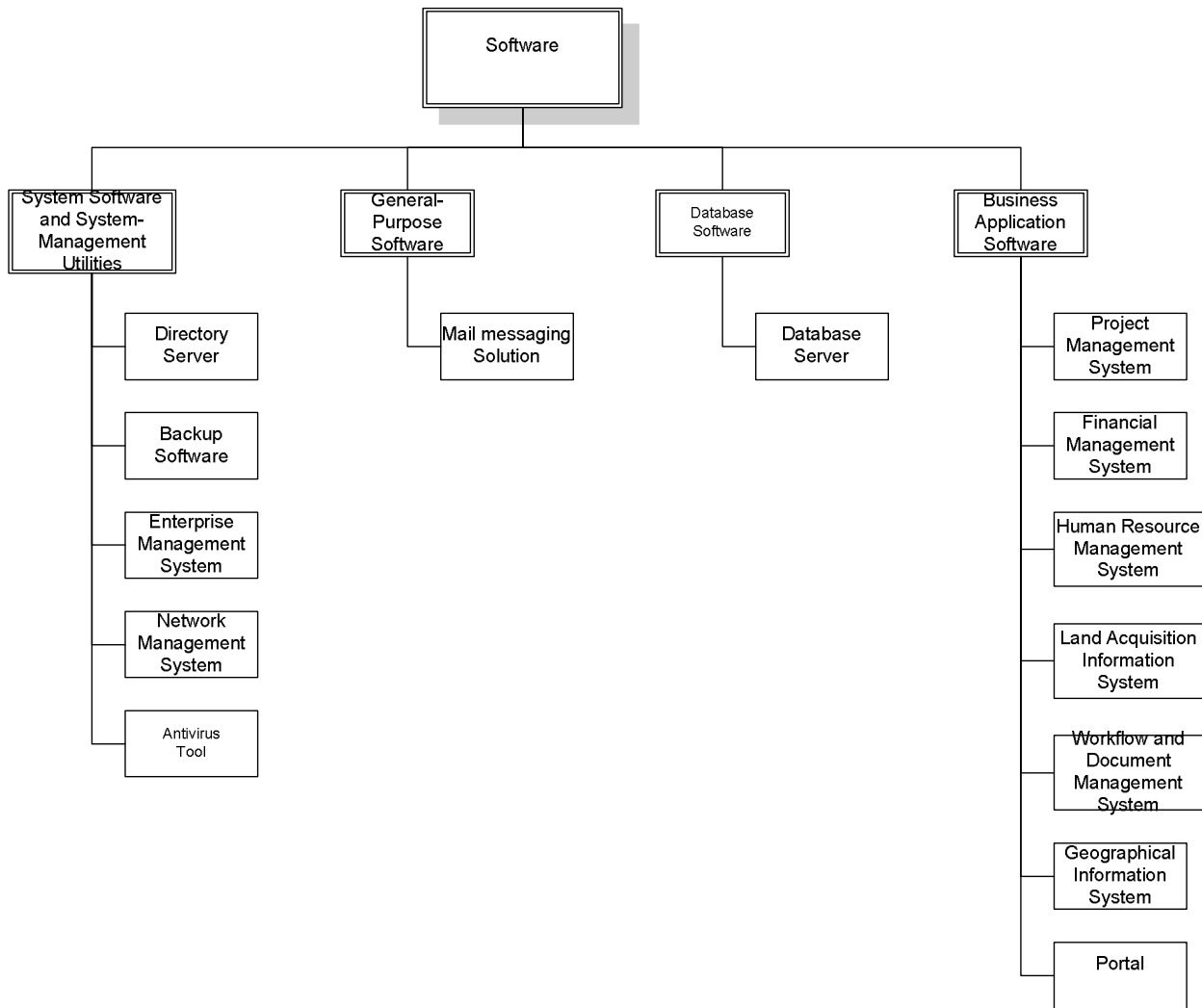
7. Core Switch

#	Specification
	Core Switch- Specification
1	Deployment:
	2 Nos. of Core Switches would be deployed at the core of the network to ensure redundancy in the system. Core switches should be offered with necessary software/hardware to enable active-active performance for both the core switches. Each switch should have following specifications:
2	Features:
	Modular chassis based switch with minimum seven payload slots
	Shall have Power supply redundancy
	Suggest the switch should support both ipv4 and ipv6 in hardware.

#	Specification
	The switch should support passive backplane with bus bandwidth capacity of 40Gbps FD between the IO modules and the Switch fabric processor.
	The switch should support the ability to manage multiple chassis's as a single virtual chassis using virtual technology.
3	Performance:
	Should support redundant cpu with total switching capacity of 720Gbps or more.
	Minimum 350 Mpps forwarding rate should be supported
	Shall support Hot-swappable power supplies and switching modules
	Shall be capable for minimum 4096 802.1q active VLANs
	Should support minimum 64,000 Mac Addresses
4	Layer 1 Features
	Support for 100BASE-FX, 10/100 BASE-TX, 10/100/1000 BASE-T, 1000 BASE-SX, LX, long haul & GBICs/SFP
5	Layer 2 Features
	Shall have Layer 2 switch ports and VLAN trunks
	Shall have Link aggregation and port Trunking across line cards
	Shall have IEEE 802.1Q VLAN encapsulation
	The switch should support time based acl, with capability to bind IP to MAC to PORT.
	Support LLDP
6	Layer 3 Features
	Shall have Static IP routing
	The switch should support Graceful restart for OSPF/BGP/IS-IS
	Shall support VRRP / HSRP for redundancy.
	Shall have IGMP v1 & v2 / v3
	Shall have IP multicast routing protocols: PIM-SM
7	MPLS Features
	Should be capable to support hardware based Layer 3 MPLS VPN.
	Should support Layer 2 VPN with draft Martini and Kompella.
	The switch should support MPLS features like MCE and MPLS OAM.
	The enabling of MPLS features should not put load on the switching performance.
8	Advanced Service applications features
	Chassis should support wireless, IPS, firewall module.
9	Network Management
	Should be compatible with SNMP v1, v2, v3 base devices
	Shall have features to provide detailed out-of-band management
10	Availability
	Shall support Dual Switching Fabric / Processor
	The switch should support sub 50ms convergence time for redundancy.
	N+1 Redundant Power Supply
	Hot Swap ability on all modules and Power Supply
11	Security:
	Shall have Filters/Access-List on all ports
	The switch should support more than 1000 802.1x clients per port/module.
	Shall be TACACS+ /RADIUS enabled
	Shall have SSHv1 and SSHv2

#	Specification
	Shall have Dynamic Address Resolution Protocol (ARP) inspection
	Shall have Management Access Filter (Access Policies).
12	Actual Ports Requirements for this tender needs to be decided.
	48 * 10/100/1000 Base T ports
	24 * 10/100/1000 Base X SFP ports

Attachment 14: Minimum Envisaged Software Components



Attachment 15: System Software Specifications

Following are the specifications of the required System Software. Bidder must state compliance of the proposed solution to the described specifications. Bidder should justify the compliance through data sheets/ whitepapers or any other publically available document in the Remarks column. The supporting must be submitted along with the Proposal.

1. Directory Services

#	Specifications
1	Should provide support for X.500 naming standards and should support Kerberos for logon and authentication
2	Support for integrated LDAP compliant directory services to store information about users, computers, and network resources and making the resources accessible to users and applications
3	Should support directory services integrated DNS zones for ease of management and administration/ replication
4	Should Support for DNS as the locator service (service records & dynamic updates)
5	The directory service should support features for health monitoring and verifying replication
6	The directory service should provide support for Group policies and software restriction policies
7	The directory service shall provide support for modifiable and extensible schema
8	Should support multi-master directory service replication features, Directory Server should be scalable and should have multi-master & multi-site capabilities
9	Should support security features, such as support for Kerberos, smart cards, public key infrastructure (PKI), and x.509 certificates

#	Specifications
10	<p>The Object types supported should include:</p> <ul style="list-style-type: none"> • Users Object Type; • Groups (Security & Distribution Groups which can be static or dynamic) • Foreign Users (Non-employees/Business partners etc.) • Printers • Containers for purposes of grouping, administration and policy control
11	Search capability to query all directory objects.
12	Search capability to query network resources by attributes.
13	Should support recovery of a Single Object as well as the entire directory.
14	Loss of a single directory server should not affect ability for users to logon.
15	Should have single integrated directory for OS and Messaging with unified management capabilities.
16	Should support that password reset capabilities for a given group or groups of users can be delegated to any nominated user.
17	Should support that user account creation/deletion rights within a group or groups can be delegated to any nominated user.
18	Should support that group membership management within a group can be delegated to any nominated user.
19	Should support multiple password and account lockout policies for different set of users.
20	Directory services should be extensible & should have capability to be extended for custom development.

#	Specifications
21	Should provide the audit capability to log old and new values when changes are made to objects and their attributes; should provide delete protection for directory objects.
22	Should support the deployment of a read only additional directory server which may be deployed in a different location so as to prevent any changes from the other location.
23	Directory services should support directory database snapshot tool, which should support creating snapshots of the directory database & should allow directory administrator to view the objects within the snapshot to determine the restore requirements when necessary.

2. Backup Software

#	Specifications
1	Backup Solution should be available on various Operating System platforms like, UNIX, Linux, Netware, and Windows and etc. Should support clustered configurations of the backup application in a cluster
2	The backup software should be capable of doing full, incremental, differential, and variable block based de-duplicated backups. The backup software should be capable of performing self healing of backup indexes, this would include consistency checking on its indexes to verify if there is any corrupt data.
3	Ability to restore backed up data from native OS utilities to eliminate the dependence of backup software and in case of disaster.
4	Software should have full command line support on above mention operating systems.
5	Should have SAN support on above mention operating systems. Capable of doing LAN free backups for all platforms mentioned above.
6	Should support "Hot-Online" backup for different type of Databases
7	Software should have an inbuilt feature for Tape to tape copy feature (cloning, within the tape library) to make multiple copies of the tapes without affecting the clients for sending tapes offsite as part of disaster recovery strategy.
8	Should have the optional ability of staging the backup data on a disk and then de-stage to a tape based on the policy for faster backups.
9	Should de-duplicate the data at target, source and media server level without requiring any additional hardware

3. Security Solution for email gateway and web gateway

#	Specifications
1	The antivirus & anti-spam solution needs to address the following security issues: 1. Secure email gateway 2. Secure web gateway and 3. Secure servers along with antimalware components.
2	The Antivirus solution should support automatic and manual program and definition update
3	Should support online upgrade, where by most product upgrades and patches can be performed without bringing messaging server off-line.
4	Should be capable of detecting and cleaning virus infected attachments as well as malformed content.
5	Should support scanning for all types of compressed and archived files (e.g. ZIP, RAR, TAR, CAB etc.)
6	Should support scanning of nested compressed files
7	Should support scanning of a single mailbox or a one off scan.
8	Updates should be capable of being rolled back in case required
9	Common solution and single pass scan for anti-spyware and anti-virus infections; and anti-virus and anti-spyware solution should have a common web based management console
10	Should support various types of reporting formats such as CSV, HTML and text files
11	The solution should allow multiple allow and deny lists to provide flexible protection.
12	The solution should provide IP based block-and-allow list based on sender reputation. These lists should be automatically updated as new versions become available. It should also allow administrators to configure additional IP allow-or deny lists as needed.
13	Should support content filtering based on sender or domain filtering
14	The solution should support domain-level black and white lists. The solution should also support DNS Based Distributed black lists.
15	Should restrict e-mail bound Virus attacks in real time without compromising performance of the system
16	Updates should not cause queuing or rejection of email
17	Inbound and outbound monitoring on all data transfer mechanisms and all e-mail systems

#	Specifications
18	The solution should be a multi-layered spam protection leveraging different filtering technologies, including spam signatures, heuristics, reputation filters, language identification etc.
19	The solution should proactively target patterns common in spam campaigns.
20	It should support Tagging and forwarding of SPAM or likely SPAM messages.
21	It should be possible to tag email by insertion of tags either into the Email header or the subject line so that the end user can be indicated of its possible contents.
22	The solution should provide a choice of actions to be taken on Spam Mails. The action may be to just identify a type of message, tag a message, delete and or quarantine/archive a message or a combination of the above.
23	The solution should have a mechanism to authenticate messages using Sender Policy Framework (SPF) & It should employ checks based on Sender ID.
24	<p>Should provide anti-spamming capabilities which allows administrators to:</p> <ul style="list-style-type: none"> • Apply controls to the messaging system that will block receipt of messages into the system. Apply controls based on content, recipient identification, sender identification, sender post office, or other selectable parameters on the client side. • Apply controls based on the Sender ID framework as industry standard for the anti-spam initiative • Apply threshold levels based on content of inbound email – junk email and non-junk email classification • Apply policies on handling of blocked mail – archive, deletion etc.
25	<p>Should provide anti-spamming capabilities which allows end-users to:</p> <ul style="list-style-type: none"> • Classify messages as spam and not spam • Create rules that handle future spam and non-spam messages • Review messages that have been marked as spam
26	The solution should provide protection from Directory Harvest Attack.
27	Should support in-memory scanning so as to minimize Disk IO
28	Should support Multi-threaded scanning
29	Should provide content filtering for message body and subject line, blocking messages that contain keywords for inappropriate content
30	The deployed anti-virus solution should include but not be limited to the following scanning capabilities: On access scanning, real time scanning, On-demand scanning, Scheduled scanning, heuristic scanning and compressed file scanning

1. Enterprise Management System

The proposed EMS solution should monitor fault, availability and performance of network devices across Management. Various EMS components should provide out of the box seamless integration capabilities. Proposed EMS solution should be able to analyze data and generate reports for ISO 27001 compliance of the system. Bidder should provide necessary OEM certificate

a. Network Fault Management

#	Specification
1	The Proposed Network Fault Management consoles must provide web based topology map view from a single central console. The system should provide discovery & inventory of heterogeneous physical SNMP enabled network devices like Hubs (Layer 1), wireless (WAP) devices, Layer-2 & Layer-3 switches, Routers and other IP devices and do mapping of LAN & WAN connectivity with granular visibility up to individual ports level.
2	Network Fault Management GUI should be Web-based providing views for Navigation, Contents & Components Detail. Navigation view should provide views for Users, Locator and Explorer search. Contents view should provide views for Alarm, Topology, List, events. Components detail should provide Impact, Root-cause, Host Configuration, Interfaces & Alarms history information.
3	The discovery should be able to identify and model router redundancy using proprietary protocols so that alarms generated from these virtual addresses are automatically excluded.
4	Proposed fault management should be able to discover MPLS links between MPLS routers for isolating problems of link failure due to provider backbone failure or CE MPLS router failure.
5	The proposed system must support multiple types of discovery like IP range discovery - including built-in support for IPv6 ,Import data - from pre-formatted files (IPs, ranges, strings or ports),Seed router based discovery - Using route tables and SNMP MIBs, Trap-Based Discovery - whenever new devices are added with capability to exclude specific devices based on IP addresses / IP Address range
6	The proposed solution must use advanced root-cause analysis techniques Out of the box for comprehensive analysis of network faults. The system must deduces the root cause of the problem and in topology it should visually pinpoint single impacting device (in red color), as well as other impacted devices (in gray color).
7	The tool should provide sufficient reports pertaining to asset inventory, alarms & availability reports as well as a detailed asset report, When a report is run, the administrator should have an option of specifying the number of consecutive days the port may be “unused” in order for it to be considered “available”.

#	Specification
8	Proposed Fault management must provide Spotlight views for Router Redundancy, VLAN list and VPN list. When clicked on a particular VLAN from VLAN List, participating devices only for that particular VLAN gets highlighted in the topology map.
9	Proposed fault management should display connecting link between two devices and port labels in same web GUI once clicked on a particular link. If there are multiple links between two devices all the multiple links between two devices and their connected port labels must be visible in same web GUI.
10	Synchronized Discovery is required in order to reduce effort to discover devices again in performance management engine. Devices once discovered in groups in Fault Management should be imported directly into groups inside performance management engine without a need to run separate discovery in performance management engine
11	Discovery can be synchronized in the Performance Engine in following ways: o New discovery initiated based on Global Collections. o New discovery when device models are added to a Global Collection in Fault Manager o Rediscovery when a device is reconfigured in Fault Manager
12	Discovery should be synchronized in a way for any configuration change detected on device like IP address change etc within fault manager it should automatically reinitiate discovery in performance management software
13	The proposed NMS should provide unified workflow between the fault and performance management systems including bi-directional and context-sensitive navigation, such as <ul style="list-style-type: none"> • Navigate from the Topology View to At-a-Glance or Trend Reports for any asset • Navigate from the Alarm View to At-a-Glance, Trend or Alarm Detail Reports
14	The proposed solution should provide Southbound Gateway interface, TL1 interface for integration with third party tools as well as provide XML /DTD toolkits to import topology data from external database.
15	The system should provide capability to measure & report on response time for common TCP/IP applications using test on routers: HTTP, HTTPS, DNS, FTP, SMTP, SNMP, POP3, ICMP, Jitter

#	Specification
16	The system should support secure device configuration capture and upload and thereby detect inconsistent “running” and “startup” configurations.
17	The proposed system should be able to administer configuration changes to network elements by providing toolkits to automate the following administrative tasks of effecting configuration changes to network elements like Capture running & startup configuration, Upload configuration , Upload firmware , Write startup configuration.
18	The proposed tool should display configuration changes differences in GUI showing modified, remove, masked lined from last captured network configurations for routers and switches. Also this should be able to identify which user has made changes or modifications to device configurations through Fault Management Tool.
19	The System should be able to monitor Quality of Service (QoS) parameters configured to provide traffic classification and prioritization for reliable traffic transport. The solution should be able to discover and model configured QoS classes, policies and behaviors.

b. Performance Management System

Provide comprehensive end-to-end Network performance management across key parts of the network infrastructure. The proposed Network Performance Management System must provide the following feature

#	Specification
1	Proposed performance management should integrate with fault management to forward performance alarms by defining notifier rules and associated alarms shall be visible against monitored device in fault manager console
2	The proposed system shall identify over-and under-utilized links and assist in maximizing the utilization of current resources. The proposed system shall provide Performance of Network devices like CPU, memory & buffers etc, LAN and WAN interfaces and network segments.
3	The proposed system shall have report authoring tool built-in which will enable complete customization flexibility of performance reports for network devices and monitored servers.

#	Specification
4	The tool should provide a live trend diagram displaying the various resource utilization levels of various critical devices and links in the managed infrastructure.
5	The tool should provide a live exceptions list displaying the various health and threshold exceptions that are occurring in the managed infrastructure.
6	The proposed system should be able to auto-calculate resource utilization baselines for the entire managed systems and networks and allow user to set corresponding upper and lower threshold limits.
7	Performance Management mapping should match elements such as routers and switches to corresponding models in Fault Management so that Fault Manager can provide performance reporting options for the models in Network Operation Console. Further element to model mapping should allow performance alarms to be visible for the respective model in fault management Network Operation Console.
8	Traffic analysis system should be deployable as appliance based system for optimum performance.
9	The solution should be of the type passive monitoring without a need to install any probe or collector for data collection.
10	The solution must provide the following flow based metrics : Rate utilization, Byte count, Flow count, IP hosts with automatic DNS resolution, IP conversation pairs with automatic DNS resolution, Router/Interface with automatic DNS SNMP name resolution, protocol breakdown by host, link, TOS or conversation, Utilization by bit pattern, matching of the TCP ToS field, AS number, BGP next hop address, IPv6 address.
11	The proposed traffic analysis system must be capable of automatically detecting anomalous behavior such as virus attacks or unauthorized application behavior.

#	Specification
12	<p>The proposed traffic analysis system should provide visibility into new and unknown traffic patterns which is critical for ensuring the performance of networked applications, as well as identifying security risks. It should provide real-time analysis of traffic behavior for every client and server in infrastructure to help ensure network delivers application services reliably and securely. Network behavior analysis should help in :</p> <ul style="list-style-type: none"> • Providing early insight into virus-infected hosts and worm attacks • Identifying unauthorized or incorrectly configured server activity • Alerting on unauthorized application deployments • Identifying network mis-configurations, such as routing loops and inaccessible network sources • Reporting the sources of fragmented traffic <p>It should provide Enterprise Network Behavior Summary for:</p> <ul style="list-style-type: none"> • Fragmented Packet Sources • High Volume Sources • Packet Fan Out Sources • Syn/Rst only sources • High Flow Sources • Number of TTL Expires
13	<p>The proposed solution must be able to monitor and report on unique protocols per day and display utilization data and baselines for each protocol individually by interface.</p>
14	<p>The proposed solution must keep and report on unique hosts and conversations per day for each monitored interface</p>
15	<p>The proposed tool must provide availability and performance for server nodes and deliver scalable, real-time management of critical systems. The proposed tool should be able to monitor various operating system parameters such as processors, memory, files, processes, file systems, log files ,daemons etc. It should be possible to configure and define thresholds for warning/critical states and escalate events to event console of enterprise management system.</p>
16	<p>The proposed tool should integrate with network performance management system and support operating system monitoring for various platforms including Windows, LINUX, UNIX.</p>
17	<p>Proposed solution should provide light weight monitoring agents reporting to network performance server</p>

c. Application Performance Monitoring System

#	Specification
1	Solution should determine if the root cause of performance issues could be inside the monitored application, in connected back-end systems or give indications about problems at the network layer from a single console view.
2	Solution should proactively monitor 100%of real user transactions 24x7 identifying the user name and IP address; detect failed transactions; gather evidence necessary for triage and diagnosis of problems that affect user experiences and prevent completion of critical business processes.
3	Solution must have ability to monitor transactions that include XML, SOAP and other identifiable protocols over HTTP/S.
4	Solution must be able to monitor complex web pages comprised of multiple components like frames, Java-script, images, and other HTTP components.
5	Solution must be able to combine multiple transactions into a logical business process.
6	The solution should monitor end-to-end, REAL user transactions (as opposed to SYNTHETIC transactions) in a non-intrusive manner.
7	Solution should not require end users to install/upload software on to their desktops.
8	Solution shall work based on the passive listening of the network traffic to and from the Web servers, and analyzes the transactions without affecting the performance or availability of the IT infrastructure in any way.
9	Solution should provide for self-monitoring of internal health with reports pages and alerts on errors or issues.
10	The solution should have provision for automatic transaction discovery, for example by setting up some bounding parameters to describe transactions like the web site, the language, and parameters (such as post, query, and cookies).
11	Solution must support monitoring on: <ul style="list-style-type: none"> • Transactional level • Business Process level • User and User group level
12	Solution shall be capable of real-time detection of errors and performance problems that affect the ability of customers to execute successful transactions, thus able to proactively identify errors and problems customers are experiencing and enable trouble shooting to begin before an

#	Specification
	increasing number of customers are impacted and call for support.
13	Solution shall be able to facilitate real-time detection of standard and custom error codes experienced by customers.
14	The management reports from the solution allows viewing the details for each defect and aggregate like defects into an incident, and also provides the ability to quickly see commonality across defects while still providing the ability to drill down to view the metrics for a specific defect.
15	Solution should be able to see exactly what request was sent by the end users' browser sent and the response by the application, when a defect occurs.
16	Solution must be able to provide root-cause probability graphs for performance problems showing the most probable root-cause area within application infrastructure.
17	Solution should enable analysis of performance trends over time, variance reporting, and SLA reporting information for IT and business professionals tasked with business process improvement and ensuring customer transaction quality
18	Solution must quickly create a baseline for performance over a period of time from the live production application.
19	Solution must be able to provide trend analysis reports and compare the user experience over time by identifying transactions whose performance or count has deteriorated over time.
20	Solution must have ability to automatically generate and distribute PDF formatted reports via email on a daily, weekly, or monthly basis.
21	Solution must be able to provide the ability to create user groups based on location/geographic area.
22	Solution must have ability to create user groups based on URL string, cookie value, XML attribute, IP Addresses or HTTP header
23	Solution must be able to extract data from Http request header and body to assist in identifying transactions or extract user, session and other parameters.
24	Solution should generate a graphical map of the complex transactions showing the path of the transaction across multiple application components. Map view should also highlight any triage to enable quick identification of the problem.
25	Solution must provide ability to monitor performance of applications going up to the method level of execution (Java/.Net method) 24x7 in production environments with negligible impact on

#	Specification
	monitored application (minimum overhead).
26	Solution must provide for easy dynamic instrumentation of application code, i.e. be able to enhance out of the box monitoring with extra monitoring definitions without having to restart application or JVM.
27	All application stakeholders (i.e. DBA, Operations, Application developers) must get performance data pertaining to their specific areas from single Java/.NET Application Agent within the application server and be able to display them on dashboards

d. Helpdesk Management

The proposed ITIL-based Helpdesk Management System must provide the following features:

#	Specification
1	The proposed helpdesk solution must provide flexibility of logging, viewing, updating and closing incident manually via web interface. The web interface console would also offer power-users tips.
2	Each incident must be able to associate multiple activity logs entries via manual update or automatic update from other enterprise management tools.
3	The proposed helpdesk solution must be able to provide flexibility of incident assignment based on the workload, category, location etc.
4	Each escalation policy must allow easy definition on multiple escalation levels and notification to different personnel via window GUI/console with no or minimum programming.
5	The proposed helpdesk knowledge tools solution must provide grouping access on different security knowledge articles for different group of users.
6	The proposed helpdesk solution must have an updateable knowledge base for technical analysis and further help end-users to search solutions for previously solved issues.
7	The proposed helpdesk solution must support tracking of SLA (service level agreements) for call requests within the help desk through service types.
8	The proposed helpdesk solution must be capable of assigning call requests to technical staff manually as well as automatically based on predefined rules, and should support notification and escalation over email, web etc.
9	The proposed helpdesk solution must allow the IT team to see the CI relationships in pictorial format, with a specified number of relationships on single window.
10	The proposed helpdesk solution must have a built-in workflow engine. The proposed helpdesk solution must support Non-linear workflows with decision based branching and the ability to perform parallel processing. It should also have a graphical workflow designer with drag & drop feature for workflow creation and updates.

#	Specification
11	It should support remote management for end-user & allow analysts to do the desktop sharing for any system located anywhere, just connected to internet.
12	Remote desktop sharing in Service desk tool should be agent less & all activity should be automatically logged into the service desk ticket.
13	It should allow IT team to create solution & make them available on the end – user login window for the most common requests

e. EMS integration with Helpdesk

#	Specification
1	When certain user tries to make any change on network device through fault management console a helpdesk ticket should be generated automatically
2	The Service Desk operator must have the ability to view the proposed configuration change
3	Once the ticket is approved the user should be automatically notified and able to proceed with the change
4	The proposed Fault Management Solution must support integration with proposed help desk or trouble ticketing system such that integration should Associates alarms with Service Desk tickets in the following ways: <ul style="list-style-type: none"> o Manually creates tickets when requested by Fault Management GUI operators o Automatically creates tickets based on alarm type o Provides a link to directly launch a Service Desk view of a particular ticket created by alarm from within the Network Operation console. o Maintains the consistency of the following information that is shared between alarm and its associated Service Desk ticket including status of alarms and associated tickets and current assignee assigned to tickets
5	Helpdesk ticket number created for associated alarm should be visible inside Network Operation Console .It should be integrated in a way that Helpdesk incident can be launched once clicked on ticket number for associated alarm from within Network Operation Console.

#	Specification
6	The proposed network fault management system should integrate with the helpdesk system by updating the Asset with CI information to support viewing history or open issues in helpdesk on the particular managed asset and associate an SLA to the ticket in the helpdesk. The proposed network fault management system should attach an asset identifier when submitting a helpdesk ticket. In case the asset is not found in the helpdesk database, it should be automatically created prior to submitting the ticket. NMS console must show associated helpdesk ticket number for the alarms that generated those tickets.
7	The system must support seamless bi-directional integration to the existing helpdesk system for trouble ticketing.
8	SLA's violation on monitored end user response time must open a helpdesk incident out of the box.

Attachment 16: Mail messaging solution specifications

1. Mail & Messaging Solution

#	Specifications
1	Should provide support for LDAP V3 Directory access.
2	Should provide integration with Directory services as mentioned above in Directory Section.
3	Should provide support for digital signatures.
4	Should support single integrated directory for NOS and Messaging with unified management capabilities.
5	Should provide support for simple, flexible administration using a Web browser/ MMC or any other management console.
6	Should support tools for message tracking and monitoring management.
7	Should support for clustering and automatic fail over and load balancing services.
8	Should provide support for POP, IMAP4, SMTP and Web based Access.
9	It should support SSL encryption with 128/ 168 bit keys.
10	Should provide for Simplified Server Monitoring.
11	Should provide easy creation of new database usage, activity, replication, and ACL (Access Control List) monitors.
12	System should allow access to logs to track granular user activity.
13	Periodic or per-message notification when the quota is exceeded.
14	Support for Admin Script.
15	Messaging server should be capable of implementing Private Blacklist, Private White lists and DNS White lists.
16	Should be capable of providing policy based administration controls.
17	Should provide for horizontal and vertical scalability.
18	Should provide reporting features to monitor Statistics and Events on the servers.
19	Messaging System should have in built compliance engine to enforce government compliance & regulation requirements.

#	Specifications
20	Messaging system should be able to provide archiving & message indexing capabilities on per user, per distribution list and per database basis. This feature is required for fast recovery of messages on mailbox or portal server.
21	Messaging solution should be able to provide customizable message classification like confidential, personal, company/department confidential, do not forward, client attorney privileged etc.
22	Messaging solution should be able to provide end to end encryption with a minimum of 128 bit key encryption.
23	Messaging solution can be able to enforce email retention settings on users so emails can be retained/archived/deleted as per policies.
24	Messaging solution should feature for Sent messages to be recalled by the sender.
25	Messaging solution should be capable of administration through an interface to provide server level control and configuration of the messaging system for all servers including: Create / rename/ delete mail accounts Reset/ set user passwords for Directory
26	Should support encryption between different messaging server roles to help ensure that all the messaging data transferred between messaging servers is encrypted.
27	Should support browser based email access (latest versions of Internet Explorer, Mozilla Firefox and Google Chrome should at-least be supported) with features including schedulable separate out-of-office messages for internal and external users, S/MIME support, Really Simple Syndication (RSS) subscriptions, and Managed E-Mail Folder access etc.
28	Should support a scheduling Assistant to provide visual guidance on the best dates and times for meeting, based on the schedules of invitees and resources.
29	Should support Multi-Mailbox Search Administrators should be able to perform fast, full-text search across all mailboxes if required for legal or other purposes.
30	Should provide core anti-spam capability out-of-box ; Mail server should have an ability to have an internet mail filtering functionality to Separate spam; the messaging server should have built-in server-side filtering and also Client side filtering.
31	Should enable immediate preservation of a user's deleted and edited mailbox items (e-mail, appointments, tasks, etc.) from both their primary mailbox and Personal Archive. Litigation Hold can be set on individual mailboxes or across the enterprise and also includes an option that automatically alerts users that a hold has been placed on their mailbox.
32	Messaging solution should have tiered architecture like Mailbox Servers, SMTP Gateway and Users Access Server. Multiple Mailbox servers should be used to provide redundancy & clustering capabilities. Gateway servers should be deployed for user access functions with capabilities like portal based Web Mail, push based mobile mail access, VPN less email access from internet and to route to internet with anti-spam capabilities like content filtering, domain filtering.

Attachment 17: Database Server Specification

1. Enterprise Database Server

#	Specification
1	The license should be full use. The license should not be restrictive to any application.
2	Support for High Availability Clusters
3	The database should be able to interface directly with High Availability Clustering Software on UNIX, Linux & Windows
4	Database should provide High availability & Disaster recovery using cost effective option of automatically synchronizing the transaction logs to disaster site, which in case of fail over the other node provides the availability of all data. This flexibility of log synchronization should be supported from Enterprise to Entry Level server edition of the database
5	Database should have received the security certification from the International Common Criteria for Information Technology Security Evaluation
6	Database should also comply with Federal Information Processing Standard 140-2 (FIPS 140-2) standard. This standard describes US Federal government requirements for IT products that employ cryptographic modules
7	A centrally Monitored & Browser Based GUI Administration Tool should be available with the RDBMS to Create, Delete & Manipulate different Database Objects and also Schedule Queries priorities centrally

Attachment 18: Functional Requirement Specifications (FRS)

1. This Functional Requirement Specifications (FRS) is for the Application software referred to in Section VI → Technical Requirements of the Bid Document. These FRS are linked to the processes indicated in Section VI → Technical Requirements → 0.2.1 Overview of Current Business Objectives & Processes.
2. Supplier has to ensure that the solution has appropriate India specific localization built-in.

Portal

Module	Functionality
Accessibility & Authentication	System should Authenticate users accessing the portal
	System should offer single entry point for stakeholders and applications relevant to them
	The portal shall provide multi-channel access including mobile/wireless support besides “traditional” access methods such as the Internet
	Portal should support secure (encrypted) access over the Internet/Intranet through a secure, remote, on-demand access and to applications without the need to add any client software on the desktops
	System should provide Single Sign-on facility to other application. Users should be mapped to the applications relevant to them. The portal will provide single sign on feature so that the end user need not individually logon to separate applications. Users can be categorized into following categories: <ul style="list-style-type: none"> - Employees - Contractors/Consultants - General Consultants - Independent Engineers - Government Agencies (MoR , MoF)
Usability	The portal shall provide strong personalization features enabling the portal to customize the portal pages to fit the stored preferences profile of the user accessing the portal. Personalization should be focused on presenting information and application and services relevant to the user. Personalization should also encompass defined screen layout, preferred colours, preferred links ...etc.
	Portal should have a section for authorized users to upload content sharable: <ul style="list-style-type: none"> • Within the organization • among a team • Non sharable – exclusive usage of the user
	The portal shall provide comprehensive sitemap details in a easy to browse format

Module	Functionality
	The navigation, look and feel of the portal should be primarily consistent throughout to provide enriched user experience. The exact format and layout shall be defined during the analysis and design phase of the project.
	RSS field for downloading latest press releases, tender information, Magazines should be possible.
Collaboration	Portal should include project-based collaboration.
	The portal shall provide collaboration services such as Message Boards, Bulletin boards that can be leveraged by the various participating departments
	Collaboration solution include searchable threaded discussions
	Project collaboration should include advanced search.
	System should have search facility, both metadata search as well as full text search
	Capability to use the enterprise-wide search to retrieve projects and project objects. The search results shall be secured so that only project members can view the appropriate search results.
Dashboard	Portal should display the reports in the form of dashboard according to the user logged into the system. Users having a role that contains the dashboard(s) should automatically navigate to it upon login.
	Portal should have a dashboard based on applications to give a snapshot of various on-going projects (financial and physical status) with respect to schedule, geography, resources, milestones, cost and facility to drill down to transaction level. The Dashboard should be accessible in an easy to use graphical format.
	The dashboard should be customizable and access restricted for the intended group. The data elements/ reports accessible to an employee should be viewable to all the employees higher up on the hierarchy
	System should be able to aggregate data related to Project Financial status, Project Physical Progress, Funding status, Land Acquisition status, Compensation award status etc. at various levels like: <ol style="list-style-type: none"> 1. Corridor 2. Section 3. CPM 4. Contract,
Interfacing Requirements	Portal shall be the primary Interface to users. As the Portal will have the facility of single Sign-on, the system should interface with all the applications developed/ integrated under the scope of this assignment.

Financial Management System

Module	Functionality
Budgeting	Should allow to store the budgeted data for multiple years; also it should have the facility of making the budgets for multiple years
	Should be able to create different type of budgets in the same year
	Should allow the user to maintain budgets on-line
	Should have the capability of Consolidating the budgets by Project Activity at the corporate level
	Should be able to maintain original budget, revised budget and latest forecast for each account
	Should maintain budget at various levels (e.g. at project level/ WBS level, CPM Level, Corridor Level, sub account for some accounts, income/expense for other accounts etc.)
	Should automatically allocate an annual budget over multiple accounting periods based on an equal amount or a specific monthly allocation profile
	Should automatically generate a budget from previous years actual or budget with a percentage increase or decrease
	Should provide budgeting on a monthly, quarterly and annual basis based on the PERT chart(s) prepared at Corridor, CPM, Contract Level
	Should be able to create budget worksheets with prior period actuals
	Should have the facility of providing various simulations/scenarios based on certain assumptions
	Should facilitate multiple level approvals and multiple iteration
	Should have the facility of preparing the budget at the Department/ Project/ CPM level and then automatic Consolidation at corporate level
	Should have the facility of preparation of budgeted P&L and Fund Flow based on the working sheets
Should have the flexibility of importing & exporting the budgets worksheets	
Should be able to maintain chart of accounts	
General Ledger	Should be able to maintain multiple chart of accounts, if required in the case of Projects
	Should maintain project codes, contract codes, and job codes or assigned cost centers
	Should be able to maintain task codes or activity codes assigned within projects
	System shall allow user to define various budget heads and allow grouping of budget heads. Capital Budget and Revenue budget heads should be provided.
	Should be able to create and maintain accounts and account information on-line
	Should be able to delete inactive accounts in-line if date of last activity is in the prior year and the account balance is zero

Module	Functionality
	Should be able to create memo accounts for collecting non-financial statistical information
	Should be able to segregate expense accounts by Cost/Profit center, department, Corridor and Contract & contractor
	Should be able to transfer or consolidate accounts and automatically combine all details
	Should be able to record settlements and adjustments through journal entries
	Should be able to carry out reversal of journal entries
	Should be able to post journal entries in batch
	Should be able to sort information from a header record in each transaction
	Should be able to repeat details from the previous journal (e.g. date, description) while at the same time preventing duplication of journal entry
	Should be able to enter description for each detail line of a journal
	Should not be able to post balances without an associated transaction
	Should be able to create multiple batches of journal entry at one time
	Should be able to automatically accept and post journal entries from Account Payable, Accounts Receivable, etc.
	Should have unique number for each journal entry
	Should be able to look-up by account number and description during entry
	Should be able to debit or credit a control account by the same journal voucher
	Should be able to close a batch of journal entry transactions that is not balanced
	Should be able to create automatic recurring journal entries
	Should be able to create automatic recurring entries that allocate one account balance among several others based on ratios
	Should be able to terminate a recurring journal entry based on the automatic accumulation of all payments equaling total commitment
	Should be able to set starting and ending period/year for recurring entries
	Should be able to enter and maintain statistical information either along with or independently of journal entries
	Should be able to make journal entries for current and future period
	Should be able to make multiple accounting periods to be open at one time
	Should be able to post pre-payments like depreciation, internal charges for manpower, fixed assets depreciation, etc.
	When previous period is open and subsequent period posting is also going on then the available opening balances should be taken for reporting purpose
	Should be able to post adjustments to prior year
	Should prevent duplicate posting to the same account

Module	Functionality
	Should be able to check before a period close that all the vouchers have been authorized and posted and Should give a warning if some unauthorized /un-posted voucher remains in the system
	Should ensure at year-end close that all entries are in balance and that all periods have been closed
	Should identify and process accruals with automatic reversal in the next accounting period
	Should be able to automatically post accrual/reversal entries after closing
	Should automatically roll-up detail accounts to summary accounts
	Should be able to calculate and maintain current, prior, and previous year comparative information
	Should be able to revise invalid journals
	Should be able to define a number of suspense codes
	Should be able to post errors to different suspense codes according to the source
	Should be able to correct transactions posted to suspense real time
	Should be able to save and transfer all supporting detail of the suspended item as originally entered when a correction is made
	Should be able to capture cash advances paid to the employees
	Should be able to book expenses on vacation settlements conducted by Payroll
	Should be able to generate Bank Payment vouchers based on these settlement expenses
	Should be able to generate Cash Payment vouchers based on these settlement expenses
	Should be able to maintain Bank required formats for Payroll payment advice
	Should be able to allow direct payments of Payroll in case of discrepancy
	Should have a GL report writer
	Should be able to generate unlimited number of financial reports for balance sheet, income statement, supporting schedule, cash flow and other specific account analysis
	Should be able to perform statistical calculations such as percent to total, or other statistical analysis of accounts
	Should be able to specify account for inclusion by :
	- natural account number
	- profit center / cost center
	- range of account numbers
	- range of account numbers with specified exceptions
	Should be able to specify the contents of each column with no restriction i.e. current month, current budget, year to date, budget to date, last year to date
Accounts Payable	Should maintain a Payables register with the following entirely:
	- Invoice Number
	- Date of receipt

Module	Functionality
	- Amount
	- Date sent for approval
	- Person sent for approval
	- Approval receipt date (later)
	- Transmittal number (later)
	Should be able to register Invoices received and generate a scroll no
	Should be able to define template for invoices
	Should be able to receive, electronically, with digital signatures, invoices from contractors, consultants
	Should be able to perform centralized receipt and payment of invoices
	Should provide:
	- invoice register facilities
	- certification of invoice values
	Should update General Ledger:-
	- at the time of bill passing
	- at the time of approval of GRN
	-Service receipts in case of service type payment
	Should be able to make recurring payments at a frequency other than month
	Should be able to perform release - approval hierarchy for Invoice approval
	Should be able to provide the following fields in the transaction record:
	- vendor code
	- vendor reference invoice number
	- unique transaction reference for internal use
	- invoice type
	- terms
	- invoice date
	- invoice receipt date
	- posting date
	- due date
	- period
	- gross amount
	- discount/deductions
	- penalty deducted for late delivery
	- other deductions
	- net amount
	- quantity
	- unit price
	- transaction currency
	- currency rates
	- payment method e.g. cheque, telex transfer
	- bank details
	- narrative
	- GL code
	- hold information

Module	Functionality
	- status code
	- flag prepaid for items
	- whereabouts of invoice for tracking
	Should enforce additional check for verification for period specified invoices
	Should alert at the time of invoice receipt and entry as to whether the invoice is duplicate
	Should be able to reference GRN under which the items were received
	In case of a service contract, should be able to provide a unique reference
	Should check for duplicate vendor invoice amounts
	Should check for duplicate vendor invoice numbers
	Should alert and stop transaction if the invoice has already been paid
	Should be able to enter general ledger code distributions on:
	- purchase orders
	- vendor record
	- individual lines on an invoice
	- invoice total
	- automatically distributed based on user-defined percentages
	Should be able to copy details automatically from the purchase order to the invoice
	Should be able to edit copied details from the purchase order
	Should be able to prevent (access rights) users from changing details copied from the purchase order
	GL distribution codes should be validated:
	- in the AP
	- interactively in a GL
	- only when interface files are input to a GL
	Validation should be on-line and/or in batch
	Invalid transactions should be rejected or posted to suspense
	Should check that the total recorded against the distribution lines equals the total invoice sum
	Should be able to capture data for printing cheque automatically from the system
	- Vendor
	- Amount
	- Other details
	Should print cheque with the:
	- remittance advice above the cheque
	- cheque above the remittance advice
	- cheque beside remittance advice
	- separate cheque and remittance advice
	Should be able to customize cheque printing format
	During the cheque printing routine, should print asterisks or wild characters to fill up the numeric and description blocks not being used in the amount and word fields of the cheque

Module	Functionality
	Should be able to print cheque drawn on multiple bank accounts
	Should be able to recover in the event of a failure in the cheque printing process
	Should be able to prevent the same cheque from being printed in both the original and the recovery process run
	Should be able to accommodate payment of multiple advances to same vendors against various PO through one cheque.
	Should be able to allow inclusion of detention charges, deduction of penalties, adjustments etc. automatically from Vendors invoice.
	Should allow pro-rata adjustment of single advance/debit note against various invoices amount passed.
	Should allow cheque to be sorted by:
	- vendor number within bank account
	- PO
	- vendor-name
	Should be able to change the format / size of the cheque while printing
	Should be able to carry out cheque reconciliation
	Should reconcile voided, cancelled or returned cheque
	During reconciliation, should calculate uncleared payments by vendor
	Should be able to match purchase orders, receiving reports (delivery notes) and vendor invoices
	Should be able to use price and quantity and delivery date tolerances
	Should be able to enter discounts not mentioned in the purchase order but available through a discount structure
	Should generate exception reports of unmatched invoices
	Should be able to generate debit notes for vendors where delivery is incomplete
	Should be able to maintain master accounts payable data:
	- Vendor address and contact details
	- Vendor Bank details
	- Vendor Payment terms
	- Employee remarks
	Should be able to define data fields for maintaining master records
	Should be able to pay advances to vendors based on P.O./W.O. or Invoice
	Should verify these advances from the books of accounts
	Should be able to make a Bank Payment voucher on the basis of above
	Should allow for pro-rata adjustment of ADVANCE paid to vendor at the time of booking of invoice.
	Should check date & year of Invoice with vendor code before accepting fresh entry
	Should be able to authorize a group of invoices for combined payments
	Should automatically reverse GL posting if a posted invoice is cancelled

Module	Functionality
	Should be able to process credit notes
	Should be able to process invoices with both debit and credit lines
	Should be able to match a credit note with:
	- parts of one invoice
	- parts of several invoices
	Should be able to set up selection voucher or batch of vouchers for invoices which are received on a regular basis
	Amount transactions entered on-line posted:
	- immediately
	- during a batch program posting run
	Memo postings should be made immediately such that they would be available for inquiry purposes
	Posting should update:
	- accounts payable
	- general ledger
	- purchase order processing
	- if the bill passed amount is different than the PO amount, the effect will go to store ledgers
	Should be able to save supporting detail associated with the suspended item in the same format as it was originally entered, and transferred to the proper code when a correction is made
	Transaction types should be by default AP voucher for all transaction through AP.
	Should post generated transactions automatically to the general ledger
	Should be able to do posting real time.
	Should handle discounts:
	- as an amount
	- as a percentage of individual invoice line items
	- as a percentage of an invoice total
	- based on the volume of the product purchased from the vendor & Discounts received after actual delivery.
	Should post discounts automatically to the correct general ledger account for discounts
	Should be able to process more than one accounting period typically previous and future periods
	Should be able to handle accruals with automatic reversal in the next period
	Should be able to accept:
	- balance forward
	- open item accounting
	Should be able to match invoices to goods and services received which have generated, on receipt, an accrued liability
	Should be able to search by:
	- supplier name
	- supplier short name
	- post code
	- invoice number

Module	Functionality
	- invoice reference
	- purchase order number
	- cheque number
	- transaction date
	- transaction value
	- other please specify
	Search should support wild card characters
	Should be able to handle employee expense reimbursement description, dates and time periods, and cross reference to related sales outcome by:
	-identification of employee expenses
	-identification of related advances
	-identification of itemized expenses
	Should distinguish between types of prepaid advances & adjustment of same while passing the bill
	Should be able to select bank accounts for disbursements, including reviewing multiple bank accounts to determine the proper account to issue checks from
	Should have on-line help and value prompting
	Should be able to process unmatched GRN at the end of any date/month
	Should be able to check with payment-terms of PO to get schedule of payment on respective date.
	Should be able to provide screen vision of receipts of imported materials/Equipment/ Engg-spares before passing bills of clearing-agents.
	Should generate liability statement for transporters invoices as against materials already received by DFCCIL
	Should be able to generate AP/RECEIPT voucher for mapping of respective invoices e.g. refund recd from suppliers
	Should be able to maintain open items in both local and foreign currency
	Should be able to maintain standard currency exchange rates for each foreign currency
	Should be able to handle multiple standard exchange rates for a given currency based upon effective dates
	Should be able to override standard currency exchange rate with each input transaction
	When the standard exchange rate is overridden, output report generated should show:
	- the standard exchange rate
	- the override exchange rate
	- the person entering the override transaction
	All postings and account balances should be maintained in both local currency and user-defined foreign currencies
	Should be able to calculate foreign exchange gains/losses
	Should be able to post foreign exchange gains and losses to a user defined general ledger code:

Module	Functionality
	- at payment generation
	- after revaluation against the new exchange rate
	- after reconciliation of a payment
	Should be able to handle payments in currency other than that of the original invoice
	Should be able to process manual cheques
	Should be able to handle voucher preparation and cheque preparation as two stage activity
	manual cheques should close `open payable' items
	Cheque no. should be entered for manual cheque
	Should be able to display manual cheques appear on the cheque register
	Should generate numbers to Vouchers automatically
	Should be able to define the formats for numbering:
	- at the time of installation
	- anytime after go live
	Should be able to do automatic processing of recurring payment transactions
	- should be able to specify an end date
	- Should be able to report automatic payments on a separate payment register
	- should be able to make recurring payments at a frequency other than monthly
	- should be able to make recurring payments after editing the data for the current months modifications if any
	Should be able to pay vendor on one cheque for more than one invoice
	should be able to handle multiple bank accounts in the same processing run
	Should be able to stop payments to specific vendors temporarily
	Should be able to stop payment of a specific invoice temporarily
	Should be able to make payment during the same processing cycle that the invoice was entered
	Should be able to pay invoices as specified without regard to the payment scheduled date
	Should be able to make part payments
	Should be able to make a cheque on a different date than the payment voucher date and if both dates fall in different accounting periods than in which period the effect will be taken
	Should be able to issue post dated cheques
	Should list in advance all individual items to be paid on the next payment date of the cheque processing cycle
	Should be able identify all duplicate payments
	Should include outstanding credit notes in the payments calculation
	Should be able to specify individual general ledger codes for each Bank account
	Should be able to handle advance payments with and without invoice
	Should be able to make advance payments without a purchase order but based on a Letter of Intent

Module	Functionality
	Should be able to pass cheque reference numbers into the general ledger to assist with bank reconciliation's
	Should display balance is lying in the party account at the time of making payment and the detail of the balance can be drilled down from payment screen.
	Should be able to identify duplication of cheque no. used with reference to payment voucher No.
	In case of posted payment being voided, GL posting should be automatically reversed
Accounts Receivables	Should be able to maintain an Accounts Receivable master record with the following details:
	- Customer Code
	- Customer Name
	- Customer Address
	- Customer phone no.
	- Customer e-mail id
	- Customer Credit
	- Customer payment terms
	- Customer Bank Account details
	- Prior Payment History
	- Description
	- Invoice Number and Date
	Should generate alerts / reminders based on the Payment terms with the customer
	Should generate codes for new services
	Should generate codes in user defined formats
	Should be able to change the code for a service in future by adding suffixes
	Should be able to change the code for a service in future by adding prefixes
	Should maintain a list of Service / Service codes
	Should be able to perform all transactions related to a customer with reference to its customer code
	Should be able to generate Invoices for a customer/service based on automatic capture of data
	Should be able to use user defined formats for the invoices
	Should be able to generate reminders and alerts for invoiced and due from customers
	Should generate receipt for cash / check payments
	Should be able to automatically update the accounting records as soon as the receipt is generated
	Should be able to generate reminders to clients for payments before 180 days
	Should be able to send across the certificate to the vendor through electronic mail
	Should be able to record reasons against late payments made by customers

Module	Functionality
	Should generate reports on Ageing analysis for payments due
	Should maintain and generate reports on Outstandings from customer with reasons and action plan
	Should be able to separate the creation and approval of customer invoices and modifications
	Should be able to account for cash receipts
	Should be able to support accounts receivable reporting including:
	- Throughputs by revenue category, customer and period;
	- Customer performance;
	- Cash due in, by period; and
	- Discount received
	Should display the account balances for customer
	Should show account balances for the Previous years figure and the YTD figure
	Should be able to reverse Invoices
	Should be able to generate trend analysis based on the customer hierarchy
	Should be able to generate a list of inactive customers and then delete it after necessary approval
	Should be able to reprint invoices (upto 5 years)
	Should automatically link receipts to the Invoice
	Should be able to do accounting of Invoice & realizations in foreign currency
	Should be able to capture the Number of times cheque bounced
	Should be able to define penalty amount as a percentage of cheque value or flat whichever is higher.
	Should mark invoice as active, once the cheques are dishonored for the calculation of ageing report
	Should raise a exceptional reporting for every cheque dishonored and stop the service to the customer.
	Should be able to calculate interest on overdue balances as it may be specified by the user
	Should have the provision of trail balance, aging reports and accounts receivables action reports
	Should be able to allocate cash receipts to invoices including the ability to hold unallocated reports
	Should be able to analyze customer payment performance
	Should be able to generate ad-hoc customer inquiry/reporting
	Should be able to generate ad-hoc receivable inquiry/reporting
Consolidation & Reporting	Should be able to consolidate general ledgers using different accounting periods
	Should be able to define period start and end dates in the consolidation module
	Should be able to make consolidation for the subsequent periods even if the consolidation of first period is still open

Module	Functionality
	All codes entered should be able to be validated on-line, and the code description displayed for visual checking
	Should be able to reproduce the chart of accounts from any of the general ledgers in the consolidation module as a basis for consolidation
	Should display list of all valid codes and their descriptions at points when codes are required to be entered
	Should be able to generate the following reports as standard:
	- trial balance,
	- profit and loss account,
	- balance sheet,
	- net movement by account showing opening balance at start of the month, net transactions and closing balance,
	- net movement by account showing opening balance at start of the period which can be greater or smaller than a month, net transactions during the period and closing balance,
	- net movement by account showing opening balance at start of the range of continuous vouchers , net transactions during the range and closing balance at the end of the range
	- other ad hoc reports, particularly in relation to transactions
	It is likely that most reports will be produced by means of an end-user report writer. Such a report writer should be able to access all data items in the database to enable a wide range of custom reports to be written
	Should group codes depending on debit or credit balance in a account
	Should alert before consolidation if the inter department accounts are not Zero
	Should be able to use previous year data in consolidation reports
	Should be able to define different consolidation logic
	Should be able to do budgets consolidation different than the financial accounts consolidation
	Balance Sheet: Statement of assets and liabilities showing actual against budgets for current period, also listing actual for the same period last year.
	Profit & Loss statement: Listing period and year to date revenue and expense figures against budget and corresponding period in the last year.
	Project / Department Cost report: Listing period and year to date materials and overheads costs against budget and last year. Also indicate total revenue (unites) and calculated cost per employee
	Cash flow report: Listing period and year to date various cash flows against budget and last year, subtotaled at various levels (at least 3)
	Profit and Cash flow forecast: Listing forecasts of various profit / cash flow components for the rest of the year against YTD actual figures.
	Cost/ Profit Center Reports: User defined logic for budget v/s actual analysis

Module	Functionality
	Performance ratio report: Listing user defined performance measures for the period and year to date against budget and last year performance numbers. e.g.:
	- Profit / Capital employed
	- Avg. cost per unit of revenue earned
	- Operating income per unit of revenue earned
	- Net profit per unit of revenue earned
	- Avg. debtor days
	- Current ratio (current assets / current liabilities)
	- Overhead cost per unit
	System should be able to generate unclaimed cheque register
	System should be able to export the reports in common formats like MS – Word, MS – Excel and PDF
Cash/Bank Management	Should be able to make following Cash / bank payments like:
	- Vacation/Leave Settlement
	- Cash Advances
	- Lump sum / Re-imbusement Payments
	- Other payments
	- Electricity Bill
	- Water Bill
	- Telephone Bill
	Should be able to capture petty cash transactions in different locations on a real time basis
	Should be able to maintain the following information on the Bank record:
	- Bank code
	- Branch name and address
	- Type of Account
	- Account No
	- Fund based Limit
	- LC limit
	- Bank Guarantee Limit
	- Signatories authorize to operate the account
	- Relevant GL code
	- Name of the contact person
	- Telephone No
	- Balance as per Bank
	Should be able to add and maintain the cheque book No. issued by the bank
	Should be able to generate a projected cash flow statement, monthly (10th of every month)
	Should include Bill discounting and other Bank Loans for projecting cash flows
	Should generate a report before the payments run to list payments to each vendor
	Should be able generate payment forecast for the specified periods

Module	Functionality
	Should generate comprehensive cash requirements reports by period planned payment run date
	Should generate comprehensive cash requirements reports by bank
	Should generate comprehensive cash requirements reports by Vendor type
	Should generate comprehensive cash requirements reports by combination
	Should generate comprehensive cash requirements reports as defined by the user
	Should be able to generate cash requirements for an individual vendor and displayed on-line
	Should take cash requirements reports and inquiries into account:
	- registered, but unapproved invoices
	- projected payments in respect of goods received, but not invoiced
	- projected payments in respect of goods on order, but not received
	Should be able to process manual cheques
	Should be able to carry out voucher preparation and cheque perpetration as two stage activity
	Should be able to close 'open payable' items by manual cheques
	Should be able to make recurring payments after editing the data for the current month's modifications if any
	Should be able to make payment on more than one invoice for a vendor on one cheque
	Should be able to use multiple bank accounts in the same processing run
	Should be able to stop payments to specific vendors temporarily
	Should be able to stop payment of a specific invoice temporarily
	Should be able to make payment during the same processing cycle as that the invoice was entered
	Should be able to make payments on invoices as specified without regard to the payment scheduled date
	Should be able to make part payments
	Should be able to make a cheque on a different date than the payment voucher date and if both dates fall in different accounting periods than in which period the effect will be taken
	Should be able to issue post dated cheques
	Should display all individual items to be paid on the next payment date in advance of the cheque processing cycle
	Should identify duplicate payments
	Should include outstanding credit notes in the payments calculation
	Should be able to specify individual general ledger codes for each bank account
	Should be able to make advance payments with and without invoice
	Should be able to pay advance without a purchase order but on a letter of intent
	Should pass cheque number reference into the general ledger to assist with bank reconciliation's

Module	Functionality
	Should be able to make multiple payment runs per accounting period
	Should show the balance lying in the party account at the time of making payment and the detail of the balance should be able to be drilled down from payment screen
	Should identify duplication of cheque no used with reference to payment voucher No. AP/GL
	Should automatically reverse GL posting if a posted payment is voided
	Should perform automatic bank reconciliation every 15 days or as set by the user
	Should have in-built bank reconciliation facilities
	Should provide bank reconciliation capabilities
	Should identify and report gaps in cheque sequence
	Should be able to identify and generate a listing of outstanding cheques
	Should include voided, cancelled or returned cheques in reconciliations
	Should be able to calculate un-cleared payments by vendor during reconciliation
	Should be able to identify and flag the un reconciling items
	Should be able to specify the date of realization of cheques or collection
	Should be able to capture date of Bank Transfer
	Should be able to import the bank statements for the purpose of bank reconciliation
Investment	System shall allow user to define the allowed investment instruments
	-Equity
	-Bonds
	-FD
	System should record the details such as:
	-Investment amount
	-Investment date
	-Rate of Return
	-Maturity date
	-Expected Maturity value
	-Purchase Market Value
	-Current Market Value
	System should be able to consolidate the investment portfolio
	System should be able to generate Portfolio valuation
	System shall have a facility to track primary dealers and their details. It should display the best primary dealer's quote alongside the live market rate for a given debt instrument. Primary dealer quotes should be stored in the system. The documents received should be time stamped

Module	Functionality
	System shall have facility to track all investments in equity (primary and secondary), fixed deposits, bonds, debt markets etc. Investments can be identified as 'Marked for trading / Mark to market' or 'Held to maturity'
Interfacing Requirements	Project Management System - Workflow for payment processing to be available through PMS.
	Project Management System - Pass payment status & details for monitoring of Financial progress of the projects compared to Contractual parameters.
	Enterprise Asset Management System - Pass Asset payment status & details
	HRMIS - Workflow for payment processing to be available through HRMIS.
	HRMIS - Pass details of payment against employee salary and other claims & reimbursements
	Portal - Single-sign-on sessions details
	Document Management System - Call appropriate workflow in the DMS for archiving Invoice, supporting documents etc.
	Document Management System - Call search facility in the DMS.

Enterprise Asset Management

Module	Functionality
Asset Inventory & Depreciation	The system should Define group of assets and association of unlimited user-defined attributes
	System should keep track of various guarantees, defect liability details for each class of asset.
	All Linear assets should be geo-referenced and accessible under a GIS user interface
	The system should maintain the details about Asset procurement, asset type, department name, quantity, cost, procurement cost etc.
	System should allow data capture for Linear Assets and help in managing maintenance of the same
	System should allow calculation of capitalization value of Assets; both Asset Under Construction and Commissioned Assets
	The system should allow user to attach reference/ safety procedure documents like CAD drawings, work documents among others
	The system should Assign unique ID to each asset
	The system should setup the assets in a hierarchical architecture so as to easily find and group assets
	System should allow user to map Assets to CPM, Department, office, contractor etc.
	The system should have the facility to view the details of assets across organization
	System should track the utilization status of an asset
	The system should support multiple asset locations with flexibility of moving or transferring an asset to other organization without losing the integrated attributes or work history
System should be able to calculate depreciation for each class of asset	
Repair & Maintenance	System should maintain AMC information for Assets including: Vendor Date of renewal Amount Contact details SLA etc.
	The system should be configurable to send alerts for renewal of Insurance and AMC
	The system should Create library of preventive maintenance procedures associated with Assets
	The system should Provide logs for tracking of all the user-selected maintenance events of a critical asset
	The system should Provide ability to forecast maintenance costs based on schedules / work history
Insurance	Should be able to maintain policy wise details showing: Policy No

Module	Functionality
	<ul style="list-style-type: none"> Description of Risk coverage Starting date of policy Ending date of policy Premium paid Claim no Claim amount Claim settled on Claim amount settled Other information
	System should generate policy wise claims outstanding report
	System should be able to maintain insurance policy information for: <ul style="list-style-type: none"> Equipment insurance Workman's compensation Motor Vehicle Liability insurance Others as specified by the user
	Insurance information like sum insured, date of renewal, Insurance company name, claim details etc
	Should be able to handle the standard formats of insurance claim, which can be printed directly by picking up the relevant data
	Should be able to make insurance report for valuation of material sent for repair
	Should automatically send advance warning for the insurance policies expiring
	Should be able to capture information on accidents / incidents
	Should be able to record accident / incident reports
	Should generate reminders for claim settlement with the insurance companies in case of these accidents
Interfacing Requirement	Project Management System - Work-in-progress assets to be tracked through the PMS.
	Financial Management System - Pass Asset Capitalization details for calculation of depreciation & generation of Balance Sheet.
	GIS - Pass asset details (WIP as well as Commissioned)
	Portal - Single-sign-on sessions details
	Document Management System - Pass Asset Identifier for linking of Asset details such as Design, related Contract, Invoices, PO/WO etc.
	Document Management System - Call search facility in the DMS.
	The system should Interface with DFCCIL web portal for users to view information and place request online
	The system should interface with the messaging system for sending notification to the users via email/letter

Human Resource Management Information System

Module	Functionality
Employee record management	System should allow users to define different grades of employment
	System should allow users to define departments in DFCCIL
	System should allow users to define types of departments within the organization
	System should be able to record information including but not limited to:
	Personal Details
	Name
	Nationality/ Caste/ Religion
	Domicile as established
	Father's Name
	Permanent Address
	Date of Birth
	Place of Birth
	Health Certificate
	Personal marks of identification
	Employee Photograph
	Family Details
	Professional Details
	Educational Qualifications
	Special Qualifications
	Date of joining PF
	PF Account Number
	Service Details
	Date of Appointment
	Place of first Appointment
	Capacity on Appointment
	Pay and Grade on Appointment
	Date of execution of service agreement
	Grade details
	Department allocated
	System should generate & record unique Identification number for the employee
System should allow employees to view their own records	
Leaves	System should be able to define multiple sets of leave rules such as eligibility etc. for various grades of employees
	System should be able to define multiple leave types:
	Casual Leave
	Special Casual Leave, e.g.,
	Family Planning
	Miscellaneous
	Leave on average pay (LAP)
	Leave on Half average pay (LHAP)
Maternity Leave	

Module	Functionality
	Study Leave (Non-Gazetted)
	Quarantine
	Paternity Leave
	Define comprehensive leave accrual / credit rules in the system
	Accrued at the start of the period
	Accrued prorated every month
	Accrued at the end of the year
	Accrual only after certain period of joining
	Accrued based on no of days worked
	Accrual only for confirmed employees
	Facility to credit leave manually
	System should allow users to define a comprehensive set of Leave Encashment rules for each type of leave scenario
	System should have integration with payroll module for leave encashment related transactions
	System should allow users to view leaves eligibility and leaves availed
	System should allow users to apply for leave under different applicable and eligible categories
	System should allow definition of heirarchical workflows for approval of leaves
	System should be able to record the approval/ rejection of applied leaves and update the employee leave account accordingly
	System should allow maintenance of record of unauthorized absence
Loans & advances	System should have the facility to define multiple types of loans and Advances such as:
	Conveyance
	Bicycle
	Scooter
	Car
	House Building
	On deputation
	Computer
	From Provident Fund
	Natural Calamity
	Furnishing
	PC Loan
	CGHS
	System should allow users to define loan eligibility criteria
	System should allow integration with payroll module for the choice of mode of payment
	The system should be able to capture repayment conditions (no. of installments, rate of installment)
	System should allow definition of heirarchical workflows for approval of loans/advances
	System should have integration with employee service records for check of eligibility of loan and loan amount

Module	Functionality
	System should be able to scrutinize loan applications based on the checks such as available allocation of funds, Basic Pay of individual, duration of service, number of times advance is availed
Claims & allowances/LTA	System should be able to define various types of allowances as mentioned:
	Break Down
	Compensatory
	Construction and Survey
	Conveyance
	Dearness
	Deputation
	Dual Charge
	Family Planning
	House Rent
	Officiating
	Out Station
	Out turn
	Remote Area
	Running
	Training Staff
	Transfer
	Transport
	Traveling
	System should allow users to define allowances eligibility as per the group & grade
	System should allow heirarchical approval to application for allowances
	System should have linkage with attendance records as per "Leave & Attendance" module for calculation of allowances
	System should have integration with "Payroll" for payment of allowances
	System shall capture the eligibility requirement for availing LTA
	System shall calculate employee wise eligibility for LTA
	System shall track utilization of LTA and medical claims by employees
Disciplinary & Appeal Rules (DAR)	System should allow users to define the categories of misconducts
	System should allow users to define the eligible grades which can raise file chargesheet for every grade of employees
	System should allow authorized users to generate chargesheet against an employee
	System should generate unique ID for each case and should maintain case history for every DAR case. The details which are essentially required to be maintained are:
	Employee ID
	Category of charge (Major/Minor)
	Charge sheet issued by
	Brief description about the charge
	Date and number of charge sheet

Module	Functionality
	Status
	Last decision
	The system should generate statement of pending cases on a monthly basis. The statement should describe the status of the cases
	DAR proceedings should automatically effect compensation/ progression as per decision of DAR
	System should allow user to file appeal against the decision of a case
	System should track the number of appeals made by the employee. Upto 3 number of appeals are allowed to be raised
	System should support searching of case by employee number, employee name, case number etc.
Accommodation & Lease	System should allow user to maintain quarter type-wise details of existing quarters
	System should allow user to tag quarters with departments & units
	System should maintain priority list for allotment of quarters
	System should allow user to update quarter allocation details including date of allocation to employees
	Quarter allocation needs to be integrated with "Payroll"
	Quarter usage is linked with HRA payout
	Rent, Water charges, electricity charges etc. are deducted from the salary of the employees availing the facility of quarter
	System should allow user to record maintenance details of quarters
	Quarter allocation also needs to be integrated with "Employee Progression Management"
	Transferred/ Separated employees need to vacate quarters or pay penalty as per defined rules
	System should generate vacancy status for quarters occupied by employees transferred/ separated
Cadre Management & Manpower Planning	The system should be able to define Posts detailing:
	Post Title
	Cadre Title
	Cadre Controlling Authority
	Sanctioned number of Posts
	Reference Number of Government Order
	Effective Date of Government Order
	Post Classification (e.g. Technical / Non-Technical, Planned / Non-Planned, Selection / Non-Selection, Gazetted / Non-Gazetted, Ministerial / Non-Ministerial)
	Post Hierarchy (Groups A, B, C & D)
	Nature of post (Temporary, Permanent)
	Validity Period (start date - end date)
	Probation Period
	Probation Criteria (prescribed tests etc)
	Salary Grade (this may have multiple pay scales attached)
	Pay Scale

Module	Functionality
	Department
	Section
	Office
	Sub Office
	Designation (department specific post titles where applicable)
	Tenure Limit for Post holder
	Age Limit
	Educational Pre-requisites (Essential & Desirable)
	Mandatory Training Pre-requisites
	Language Requirement
	System should allow user to define "Book of Sanction (BoS)", detailing department wise sanctioned staff
	System should be able to segregate "Selection Post" & "Non-selection Posts"
	System should be able to define the grades of payscale
	System should be able to define the reporting structure of the employees
	System should be able to define norms for promotion to higher posts
	System should contain Summary of roles and responsibilities
	System should allow user to define Key Result Areas (KRA) for each designation
	System should be able to maintain 'Post-based Roster' depending on the, percentage reservation norms, maintain reservation Details for other categories like physically handicapped, sportsmen, ex-servicemen
	System should be able to calculate "Money value of posts"
	System should have defined interfaces for data interchange with accounts department for validating the money value of posts
	System should allow user to maintain seniority list of employees
	System should be able to generate "PCDO (Periodic Confidential Demi-Offical" report, detailing the department wise sanctioned versus actual availability of employees
	System should be able to maintain details of surrendered posts
	System should be able to keep record of "Money value" of surrendered posts for the each department
	System should allow raising requisition for new posts/ increase in cadre
	System should check precondition (such as comparison of money value of new post and money value of surrendered posts by the department) for creation of new post/ increase in cadre
	System should allow user to sanction creation of new post or increase in the cadre strength
	System should generate recruitment requirement as per the comparison of sanctioned and actual staff. This should also take into account the tentative retirements, progressions etc.
	The system should be able to carry out periodic manpower forecasting and scenario building in terms of posts, numbers, qualifications, skills based on user-defined staffing norms
Employee Progression Management	Probation & Confirmation

Module	Functionality
	System should be able to track the probation period for each new incumbent and provide system alerts on probation completion due dates
	System should be able to record/ update the reporting location assigned to the employee
	System should be able to retrieve data from the training module about the trainings earmarked for the employee before confirmation
	System should be able to retrieve data about successful completion of confirmatory training
	System should allow authorized user to increase the duration of probation
	System should be able to record/ update the confirmation date and location of employee
	Promotions
	System should be able to record details of Annual Confidential Report (ACR) for employees
	System should track & generate status review of Performance Assessment of employees at multiple stages
	In case of 'Adverse' remarks in the ACR, system should generate reminder & letter for communication to individuals
	System should record employee representation to 'Adverse Comment'
	System should provide time bound system reminders for disposal of appraisals with 'Adverse' remarks
	Amendment of 'Adverse Comment'
	Expunction of 'Adverse Comment'
	Maintenance of 'Adverse Comment'
	System should generate timely triggers indicating the employees due for promotion
	System should allow employee to complete Self - Appraisal as part of ACR process
	System should have integration with "Cadre Management" for accessing seniority lists
	System should be able to integrate seniority lists of employees from different departments eligible for same selection post
	System should be able to allocate employees to the vacant posts in the "Non-Selection Post" category as per the seniority
	System should be able to identify people to be called for selection procedure for "Selection Posts"
	System should be able to apply "Reservation Roaster" to the selections made for "Selection Posts"
	System should be integrated with "Employee Records Management" for updation of employee's grade & payscale details resulting due to promotion decisions
	System should record details of promotion declined
	Assured Career Progression (ACP)
	System should be able to identify employees eligible for "Assured Career Progression (ACP)" scheme
	System should be able to retrieve employment details like ACR records, pending DAR cases if any, Mandatory training requirements, of the identified employee

Module	Functionality
	System should be able to update the details of employees benefitted under ACP scheme
	Transfers
	System should be able to maintain wishlist for transfers as demanded by employees
	System should be integrated with DAR for effecting the progression due to decisions of DAR cases
	System should be able to publish transfer posting requirements
	System should be able to match transfer requirement with the transfer location wishlist of the employees
	System should be able to maintain the relieving & joining details (date of relieving & joining, passes issued at the current location of employment) of the transferred employee
	Deputation
	System should be able to generate circulars for deputation vacancies
	System should be able to receive nominations for deputation vacancies
	System should be able to shortlist nominations for deputation based on:
	Educational Qualifications
	Current Roles & Responsibilities
	Scale of Pay
	Hierarchical Grouping of Post
	System should be able to prepare post-wise seniority list of employees applying for deputation
	System should allow recording of deputation details such as:
	start date and end date of deputation period
	Post Deputed to
	Office Deputed to
	Section Deputed to
	Deputation Pay Scale
	Deputation Allowance
	System should be able to generate checklists for remittance of leave salary and pension contribution by borrowing department for the period of deputation including Foreign Service
	System should allow users to set up system alert for reminder at tenure-end when employee may revert to parent department or be absorbed by borrowing department including foreign service deputees
Training & Development	System should be able to support the preparation of yearly (or user defined) training calendar
	System should be able to perform Activity Planning of training
	Training and development should be in coherence with Employee Record Maintenance (Service Book) as training in Railways is assigned as per the date of joining of the employees
	System should support tracking of training instructors, training facilities, standard equipment required for the training and equipment available at training facilities
	System should allow recording:
	Attendance

Module	Functionality
	performance of trainee
	feedback on trainers
	feedback on course
	System should be able to receive "Training Needs Analysis" details from various locations/departments for creating a training plan
	System should be able to maintain training history (both earmarked and attended) of all employees with effective dates
	System should record competencies that employees gain from completing a course and support automatic updating of employee competency inventory
Recruitment	System should have integration with "Cadre Management & Manpower Planning" for retrieving manpower requirement actuals & projections details
	System should allow authorized user to collate department wise details of posts in need of recruitment
	System should allow user to define qualification/ requirements for post identified for recruitment
	System should allow users to register applicant and generate registration number
	System should be able to screen applications based on the requirement and the registered applicant details
	System should have interface for data exchange with Railway Recruitment Board (RRB) for informing the recruitment requirement, retrieving the applicant information
	System should be able to track applications for recruitment
	System should allow users to define recruitment schedule & define recruitment procedure for the posts
	System should be able to generate result and Letter of appointment for the selected candidates mentioning the location of joining, location of reporting, date of joining, salary & entitlements etc.
	System should be able to record following indicative details for the candidates joining at the prescribed locations:
	Employee Number of PF Number
	Employee Name
	Date of Assignment
	Employee assignment type (Regular, officer on special duty, officer on lien, temporary duty, officiating, deputation, leave reserve, ad-hoc, compassionate, part time - hourly / daily basis, contract / consolidated, contingent)
	Parent department (if applicable)
	Duration of assignment (relevant for certain employee assignment types)
	hours of work (for part-time employee assignment)
	Pay Fixation
	Benefits (Loans & Advances etc)
	Other Allowances
	Leave entitlement

Module	Functionality
	Mode of salary payment
	Compassionate Grounds
	System should be able to define the rules of dependents getting job on compassionate grounds
	System should maintain a register of all those who have applied for job on compassionate grounds
	System should allow user to define the mandatory requirements of the posts applied for
	System should be able to screen applications based on the requirement and the registered applicant details
	System should be able to generate intimation for test (s) if applicable for the post applied
	System should be able to record the test results if applicable for the post applied
	System should be able to generate result and Letter of appointment for selected candidates
Settlement & Pension	System should allow users to define the Rules for separation –
	Retirement
	Resignation
	Removal/ Dismissal
	System should be capable of generating reminders (12 months in advance) for employees due for superannuation
	System should allow users to define checklist of activities required for superannuation cases, such as:
	Verification of Service Book for period of Qualifying Service
	No - Dues verification from payroll data
	Railway assets (if any) assigned to employee
	PF data consolidation from accounts
	System should be capable enough to send reminders to the concern department where the employee is working, the Division where is located at and the Zone to which he belongs to(3-months in advance)
	System should be able to Determine applicable Pension details for cases based on:
	Length of Service
	Details of non-qualifying service (if any)
	Details of Medical Fitness
	Nature of Retirement
	System should have built in capability to incorporate and apply various user-defined formulae for calculation of pensions, depending upon (but not limited to) the following:
	Average Emoluments
	Net Qualifying Service (length of service less length of non-qualifying service)
	Total length of permissible service (33 years)

Module	Functionality
	System should have built in capability to incorporate and apply various user-defined formulae for calculation of gratuity, depending upon (but not limited to) the following:
	Basic Pay last drawn
	Current DA rate
	Net Qualifying Service (length of service less length of non-qualifying service)
	Emoluments
	Calculate Commutation of Pension (advance withdrawal of a specified percentage (40%) of "original pension" within a year of retirement based on (but not limited to) the following:
	Basic Pay last drawn
	Original Pension (i.e. pension amount before any adjustments like advance withdrawal)
	System should have built in capability to incorporate and apply various user-defined formulae for calculation of Family Pension, depending upon (but not limited to) the following:
	Basic Pay last drawn
	Pension
	System should be able to operate inter-state suspense accounts for clearance by concerned Authority / Bank disbursing the pension
	System should be able to use benefit information and changes in status for retired employees, surviving spouse and dependents as captured in Service Book
	System should be able to Record resignation request of permanent employee based on notice from employee or Appointing Authority
	System should be able to check Departmental Dues/outstanding loans/ Government assets (if any) assigned to employee
	System should have provision to capture information of all the resignation cases
	System should be able to calculate the pension payout as per the category of separation
Employee Self Service	System should Enable employee to complete Self-Appraisal as part of ACR process
	System should Enable employees to view Service Book (employee personal files) and trigger process for updates
	System should Enable employees to view training calendar
	System should Enable employees to view the details of the training undergone
	System should Enable employees to view the status of employee's training requests
	System should Enable employees to seek an approval of training request by the authorising authority
	System should Enable employees to make requests for all types of leave (Casual leave, Maternity leave, Half day leave, etc.)
	System should Enable sanction of leave applications by authoriser and automatic update of the employee leave balance

Module	Functionality
	System should Enable employees to view the status of their leave applications
	System should Enable employees to view summary information on leave availed and balances available
	System should Provide employees with easy access to payroll information
	System should Enable on-line printing of pay-slips by employees
	System should Provide employees the option of 'pre-paying' deductions (where applicable)
	System should Enable on-line application of loans, via self-service functionality
	System should Provide facilities for:
	Downloadable Forms
	Forms that can be Entered / Edited on-line
	On-line "Help" & "Responses to FAQs" for Forms & Procedures
	Loan Application' status tracking -Submitted, Approved or Under Process
	System should Enable employees to view their loan entitlements and balance, on-line
	System should Enable submission of claims by employees for themselves and their dependents as per their eligibility
	System should Enable employees to view claim balance eligibility and claim summary for all the categories of claims based on eligibility
Interfacing Requirement	Project Management System - Employee Information to be available to PMS. Employees to be tagged to Corridors & CPMs.
	Financial Management System - Call appropriate payment processing workflow.
	Portal - Single-sign-on sessions details
	Document Management System - Call appropriate workflow in the DMS for archiving employee related records.
	Document Management System - Call search facility in the DMS.

Project Management System

Module	Functional Requirements
General Functions	Ability to provide web-enabled access to project data to help project Users across DFCCIL to make timely, informed decisions and to easily manage, track, and report on their project activities
	Ability to capture the data pertaining to every conceivable aspect of the project that will contain details like technical details, financial aspects of the contracts, advance payments, repayments, work-orders, physical progress, completion schedules, expenditure incurred under various heads, targets for key milestones and analysis for deviation of actual achievement against these targets
	Ability to allow searching and retrieving information related to relevant projects quickly from various sources of data etc.
	Ability to restrict or grant access to Project Data to specific employees or Team of employees
	Ability to link two or more projects for reporting purposes
	Ability to configure alerts, wherever generated, to e-mails
	Ability to support accessing/modification of various drawings/ documents, Quality Plans, specification etc associated with a Project, Contracts and Operation & Maintenance in various formats like-MSWORD, EXCEL, Visio, CAD, PDF etc through linking with software such as auto CAD etc.
Survey	System should facilitate CPM to prepare a checklist for Surveys
	System should have provision to upload periodic survey status by survey agency as per checklist
	System should generate alert as soon as the survey report is uploaded into system
	System should allow user to suggest modification in the Survey result and send intimation to the concerned parties
	System should facilitate survey approval by authorized person of DFCC
Project Planning & Setup	Upon receiving Sanction for a section, HQ user creates a Project Entry into the system.
	HQ User should be able to define broad level Project Plan, capturing the details like overall timeframe, approved budget estimate, Length of the section etc.
	One project can span multiple CPMs. HQ User should be able to attach multiple CPMs to Project.
	HQ user should be able to split the Section into Slices
	HQ User should be able to map General Consultant(s) to slices
	HQ User should be able to define type of WORK as Electrical, Civil and S&T
	Contractor User should be able to upload/define Plan for its contract.
	The system should provide the functionality to enable creation of the Unique Project ID for implementation of the project through execution of a contract in Project management System

Module	Functional Requirements
	The system should provide the functionality to define a workflow matrix specific to a contract.
	PMC and CPM should be able to view and approve the uploaded/defined Plan.
	Ability to capture revised project plan /Schedule details if any
	Ability to establish Project plans by combining sub projects from different projects
	Create cross-project relationships
	Create Activities as the base unit for analysis of all information about the project related to costs, progress, deliverables etc.
	Create relationships between activities
	The system should provide the functionality to be able to enter milestones , milestone dates and Key Performance Indicators in the system specific to the contracts
	The system should provide the functionality to map the milestones with the quality parameters
	The system should provide the functionality to enable consolidation of all information/data of all the contracts of a particular project in project management module
	The Contract Plan should consolidate into Project Plan
	The Project Plan should consolidate into Corridor Plan
	Ability to arrive at the Total cost of the project.
	Ability to create approved budget details (activity wise/ Item wise)
	Ability to revise the sanctioned value
	Ability to generate the capital budget document as per the budgetary variables defined by management
	Ability to establish a project budget based on the operational goals and develops the project structure and schedules in parallel.
	Ability to do budget allocations and transfers across all zonal dimensions.
	The system should provide the functionality to allocating/distributing project budget over the project period as per needs of project phases
	Ability to define project Work Breakdown Structure/ Work Scheduling (WBS) by breaking down to sub-projects and activities
	Ability to support Multiple Work Break Down structure
	Ability to create a repository covering all the packages containing defined parameters like progress status of all the billable/ no billable items, Bill of Quantities (BOQ) having quantum of work and unit rates, status of quality checks etc
	Ability to store inspection Schedule
Contract Management	HQ User should be able to define Contract for combination of slice and WORK
	The system should provide the functionality to enable creation of a new contract for implementation (which should have a unique contract ID)
	HQ User should be able to map Contract to: CPM Contractor Program Management Consultant

Module	Functional Requirements
	Each CPM can have control over more than one contract
	The system should provide the functionality to provide utility to define/capture terms and conditions of the contract as per agreement between DFCCIL and the contractor
	The system should provide the functionality to establish security measures to ensure that the users are allowed to review/edit contracts they are involved with.
	The system should provide the functionality to track changes, with reasons
	The system should provide the functionality to enable creation of more than one contract for the same Unique Project ID
	The system should provide the functionality to enable creation of a contract for the more than one Unique Project ID
	The system should provide the functionality to provide utility to redefine the contract as per need after revisions if any
	The system should provide the functionality to provide all required forms and formats made available online
	The system should provide the functionality to define milestones of the contract(s) enabling capture of measurements and milestone for the project as a whole
	The system should provide the functionality to define a quality plan for the contract
	The system should provide the functionality to create and link contracts, sub contracts, activities and tasks
	The system should provide the functionality to create an Ad hoc contracts, where a work break down structure is not required
	The system should provide the functionality to print contracts reports at summary level and detailed level
	Ability for the creation of contractor master with details like name, address, phone Nos., fax nos., email id, contact persons, name of authorities, their email ids, bank information, category etc.
	Ability to define an invoicing/billing plan, according to what has been agreed with the vendor/subcontractor /suppliers, involving, for example, milestone-based billing or progress billing
	The system should provide the functionality to enable closure of contract when completed/abandoned/ terminated
	The system should provide the functionality to be able to re-open closed contracts
	The system should provide the functionality to notify all appropriate personnel, that a contract is closed
	The system should have provision to record/modify/retrieve the Performance Guarantee parameters
Project Execution & Supervision	The system should provide a functionality to define a "measurement book" for a contract.
	The system should have facility for the contractor to upload design documents for approval of the CPM
	The system should interface with the DMS for retrieval and storage of all relevant project documents, drawings and designs.
	The CPM after review flags the document for DFCC approval. System should

Module	Functional Requirements
	notify the concerned official about this.
	There should be provision in the system to approve & reject each level of approval with remarks.
	System should allow user to update/ upload Measurement Book
	System should allow user to approve Filled/ Uploaded Measurement Book
	System should be able to compare certified physical progress against the details mentioned in the bill raised by vendor
	Ability to register conduction of acceptance test
	Ability to store details of inspection results at job site
	Ability to record/modify/retrieve quality inspection results at different stages of the project to ensure consistent quality throughout the whole project lifecycle
	Ability to support inspection of vendor deliverables for compliance to quality plans recording the results of the inspection and issue of compliance certificate thereof
	The system should provide the functionality to enable defining forms for invoicing
	The system should provide the functionality to enable uploading of contractor's bill in the PMS.
	The PMS should have the functionality to interface with the FMS for settlement of contractor bills.
	The system should provide the functionality to enable Updation of project expenditure accounts after each payment
	The system should provide the functionality to track resource across contracts
	Ability to provide timesheets to record (actual) i.e. actual time spent by resource(s) or record amount of work completed related to project activities and milestone billing possibility
	Ability to capture daily/weekly/monthly/ annual Physical Progress details for monitoring purposes
	The system should provide the functionality to record the costs for each major contracts or a set of activities under investigation
Project Monitoring & Control	Ability to analyze network or Critical Path Analysis (PERT), Gantt Charts and pie charts for project activities
	Ability to monitor the status of key/critical parameters and raise alerts in case of any deviation
	Ability to capture contract variations (time schedule, cost, quality, scope, inspection schedule)
	Ability to capture, store and retrieve government and regulatory information requirements needed for construction projects like various clearances
	Ability to monitor project performance according to project parameters and present in dashboard visuals
	Ability to monitor project status at important stages of project execution and present in dashboard visuals
	Ability to monitor project costs effectively during the execution, allowing comparison of budget versus actual values at different levels of the project WBS (Work Breakdown Structure/ Work Scheduling)
	Ability to measure the status of projects by budget as well as by work completed

Module	Functional Requirements
	Ability to create consolidated financial statements per project and party/vendor
	Ability to track project costs across Project Offices
	Ability to track project costs across time periods
	Ability to monitor the costs of multiple projects across the organization. Ability to compare planned and actual costs.
	The system should provide facility to monitor the quality of project execution based on the quality parameters as per the quality plan
	The system should have the functionality to generate the quality report for individual contracts for a project and the project as a whole.
	Ability to tie the original project budget and all subsequent changes, to actual commitments (actual progress payments)
	Ability to extrapolate effect of variations in schedules on the total project schedule/ cost
	Ability to identify any variations from schedules / network at activity level and generation of Alerts at defined terms
	Ability to be alerted when project milestones are reached (e.g. volume targets, budget allocations etc.)
	Ability to generate Alerts on slippage in approval of drawings / Documents from the schedule
	Ability to generate Alerts on delay in starting / completing major activity / milestone.
	Ability to generate Alerts on reaching a user defined variation / exceptions.
	Calculate the percentage completion of the project using the following measurement techniques: <ul style="list-style-type: none"> • Start-finish rule (i.e. percentage completion of the project is based on the number of activities completed) • Time proportionality (i.e. percentage completion is defined by the time spent on the project to the total time allotted for the project) • Milestone technique (i.e. milestones are defined for the project, completion of which would be used to compute the total completion of the project)
	Ability to track vendor Invoices and their payments with respect to advances, job completion, outstanding dues against other projects etc made to a given Project
	Ability to make adjustments to billings with approval authority
	Ability to zoom from financial transactions to activities.
	Ability to keep project open and active across fiscal years.
	Ability to allow for splitting of an expense item across multiple projects
	Ability to re-open closed projects
	The system should provide the functionality to track the progress/status of assets in the "work in progress" state
	Ability to track project costs real time during the course of the project including cash flow expended, remaining & projected for use
	Ability to release & monitor the milestone payments as per the billing schedule and project implementation bar chart.
	Ability to generate on-line confirmation of receipt of material, Contract number wise / location wise.

Module	Functional Requirements
	Ability to receive all related documents along with the Bills through electronic mode.
	Ability to generate capital expenditure report scheme wise, project wise, period wise etc.
	Ability to generate the estimated cash flows for user defined periods.
	Ability to generate the projected cash flows and cash utilization reports.
	Ability to support capital Work in Progress (WIP) Accounting.
	Ability to regulate payments in accordance with budgetary allocation for the Project and for the user defined period
	Ability to monitor the expenditure booking against the sanctioned value of the Projects
	Ability to predict the effect of any variations during implementation on cost of the project
	Integration Cost Controlling components for tracking each activity and project based on:
	Budgeted Cost
	Actual cost for a period
	Actual cost to date
	Percentage completed
	Cost to complete
	Cost at completion
	Ability for making Cash Flow Projections
Project Completion & Commissioning	The system should have the provision for capturing the commissioning details and procedures for any asset that has been created in any project
	Ability to provide details for checking the correct system during start-up after having checked the partial components. Creates activity confirmation in accordance with the contract.
	Ability to monitor the site-closure phase once the construction/assembly and start-up phases conclude. Ability to record and monitor withdrawal of devices and unnecessary materials as per the contract.
	Ability to check that the project has observed all requirements and technical standards, which are already entered into the system. Ability to record every acceptance
	The system should have provision track the milestone payments made to the contractor at the time of final milestone of the project is successfully reached (the successful conclusion of the acceptance testing)
	The system should provide the functionality to provide security measures, to ensure that the project closure is done by authorized personnel only
	The system should have the functionality to generate completion certificate for the contract/project to be issued
Reports	Generate reports calculating delays in execution of activities as per project schedule
	Report based on Commitments, Budgets and Actual cost for respective budgets
	Calculate cost overruns and budget consumption till date

Module	Functional Requirements
	Calculate and compare resource deployments (actual vs. budget)
	Detailed reporting for the projects at line item level
	Forecast version values for evaluation based on:
	Cost to complete
	Actual values at the time of the cost forecast
	Commitment values at the time of the cost forecast
	Ability to generate Weekly/Monthly/annual/ad hoc Physical Progress Report
	Ability to generate Project Costing Reports on Manpower, Material and Machinery
	Ability to accept to-date bills raised by party/vendor and generation of payment status of cleared and outstanding bills
	Ability to generate fund status and working capital requirement
	Ability to generate summary report on Quality tests / material quality
	Report on Scheme-wise Capital Expenditure Details
	Report on details of ongoing projects / works and completed works (year-wise)
	Report on details of planned projects / works
	Periodically progress and status of various projects / works
	View resource allocation across multiple projects
	Ability to extract project profiles (comprising defined set of elements like name, type, capacity, land details, mode of funding, beneficiaries and major milestones etc)
	Ability to extract historical cost data per activity within the repository for further analysis and annual budgeting process
	Ability for preparation of Monthly Capital expenditure report
	Ability to monitor project performance according to project parameters and present in dashboard visuals
	Ability to monitor project status at important stages of project execution and present in dashboard visuals
	Ability to empower project managers & top management to evaluate project status, identify risk and underperforming projects using roll-up scorecard reports that graphically display key business metrics
	Ability to provide executive-level dashboard to view integrated project data side-by-side with other critical information for a more complete view of projects
	Customizable Dashboard for personal view
Tender Tracking	System should have ability for registering all the tenders floated, NIT issued, their finalization schedule, registering progress of tender finalization and status
	Ability for the creation of details of Bidders with details like name, address, phone Nos., fax nos., email id, contact persons, name of authorities, their email ids, bank information, category etc.
	The module should be able to identify and report on the following:
	Generate evaluation reports for the Bidders
	Others statements include Bidder rating, Bidder evaluation reports, EMD Vs Work order.

Module	Functional Requirements
	Ability to view guidelines of International funding agencies such as World bank, Asian Development Bank etc. (as provided by DFCCIL)
	View & use RFPs /Tender Notices/Tender documents sent to project office
	The system should be able to identify tenders by unique ID
	The system should be able to report the progress of tenders corridor-wise, project-wise, CPM-wise
	The system should be able to report the progress of the tender.
	Ability to prepare pre-award schedule (timeline for finalization of specifications, NIT-Notice Inviting tender, Opening of Bid Documents (OBD and the award) based on the latest implementation schedule, execution and the procurement timelines.
Interfacing Requirements	Enterprise Asset Management - Assets commissioning should be reflected in the EAM.
	Financial Management System - Payment(s) information to be available in real time for budgetary review.
	Financial Management System - Call appropriate payment processing workflow to process payments as per Contractual Milestones.
	GIS - Section wise Contract Information (Contractor Details, Milestones, Status of Milestones)
	Portal - Single-sign-on sessions details
	Document Management System - Call appropriate workflow in the DMS for approval & archiving of Designs.
	Document Management System - Call search facility in the DMS.
	Integration with Document Management system for the purpose of relating documents to issues, events, project Work Breakdown Structure/ Work Scheduling (WBS) and activities

Land Acquisition Information System

Module	Functionality
Land Information Management	System should allow user to store details of a parcel of land along with title details, Area, boundaries, etc
	System should assign unique Parcel ID for each parcel of land
	System should be able to classify land parcel into: District Sub-division Pargana Village
	System should be able to enter and maintain master data of villages
	System should be able to scan and upload land map for each parcel of land
	System should be able to classify a parcel of land based on its current usage and enter details of the same
	System should be able to define area for land acquisition
	System should be able to capture Competent Authority details
	System should be able to capture the environmental details associated with a piece of land
	System should allow user to link chainage to Land Parcel
	System should be able to import land parcel data from external systems (.xls files and RDBMS)
	System should allow user to record details of Joint Management Survey agency and Independent valuation
	System should be able to generate report for variance between the data of JMS and Land Records
	System should allow user to define the categories of Objections
	System should allow user to record the categories and details of objection
	System should be able search and print land data along with map
	System should be able to generate consolidated reports village wise
System should be able to generate reports like total area in a village, ownership wise land details, etc	
System should be able to generate land possession report of the identified land based on the ownership type	
R&R Information Management	Should allow user to identify and mark project affected area
	Should be able to enter and maintain household socio-economic census data (household size, Age of the members of the household, occupation of the household, earning members, household income, education details, etc) of the project affected area
	Should generate unique household number and link the socio-economic data of the household to the unique number
	Should be able to enter immovable property details of the household as per socio-economic census
	Should be able to maintain physical assets inventory of the project affected area with immovable property details and associated cost with respect to the land parcels

Module	Functionality
	Should be able to link socio-economic household data with the land record data
Compensation Definition Module	Should be able to set up an entitlement matrix with categorization of affected people, categories of associated losses, types of compensation and assistance
	Should be able to maintain land inventory data including market value, land holding type, estimated income per hectare, etc.
	Should be able set up prices/ rates for land, structures, trees, etc. of the defined area collected from different sources
	System should allow user to define parameters for Compensation calculation
	System should allow user to define formula for Compensation Calculation
	System should allow user to calculate Compensation
Land Payment Management	System should provide functionality for Budgeting for Land Acquisition
	System should be able to set up disbursement schedule for Payment towards Land Acquisition and R&R
	System should enable user to enter and update the details of payments made
	System should be able to update and track the details of disbursed entitlements
	System should allow user to update the details of payment instrument
	System should allow user to track the payment made to each PAP and should be able to reconcile the amount with that deposited by Indian Railways
	System should allow user to record the details of funds received from MoR
	System should allow user to record the details of funds transferred to Competent Authority
	System should allow user to update and track the status Land Title transfer
	System should be able to generate report on disbursal of entitlements with comparison to schedule
	System should be able to generate exception reports on disbursements
	System should be able to generate performance reports at various intervals
	System should be able to enter and maintain final value of acquisition
	System should be able to track Plot history. User should be able to record and track plot wise details of tenants, holding of tenants, compensation entitlement and compensation paid
	System should allow user to generate reports like: Payment Status Payment amount Small land holding owners converting into marginal land holding owners Average Compensation Land Acquisition Status

Module	Functionality
	Notification Status
	User should be able to generate report aggregated at Khasra/ Khatauni, Village Level, Pargana, District Level, State Level, Competent Authority
	System should allow user to search records (individual or aggregated) and print as pre-formatted report for combination of search fields like Khasra/ Khatauni Village Pargana District State Competent Authority Notification Award Date Notification Date Land Area Section Compensation Value
Grievance Management Module	Should be able to set up details of R&R committee and grievance redressal cell
	System shall allow user to define escalation matrix for grievance redressal
	System shall allow user to define workflow for grievance redressal
	System shall allow user to record the details of grievances filed
	System should be able to uniquely identify a grievance
	System shall allow user to record the decision towards a grievance
	System shall allow user to track the status of grievance
	System should allow user to enters details of Court cases filed by PAP
	System should allow user to classify the court cases according to their current court type
	System should allow user to establish parent-child relationship between court cases
Notification Tracking	System should allow user to define the types of notifications
	System should allow user to record the date of issue of notification
	System should allow user to record the details of the notification
	System should allow user to map Land Parcel to notification
	System should allow user to store a copy of the notification
	System should allow user to record the award details as per notification
Interfacing Requirements	Portal - Single-sign-on sessions details
	Document Management System - Call appropriate workflow in the DMS for archiving published notifications, G.O., etc.
	Document Management System - Call search facility in the DMS.

Geographical Information System

Module	Functionality
Image processing:	Processing of satellite imageries like Cartosat for geometric and radiometric errors
	Ortho rectification of the images with respect to the DGPS survey points
	Checking accuracy of images through field verification
	Post processing of DGPS survey data which is being done to get an accuracy of 1 meter
	There should have common display manipulation tools e.g. zoom in, zoom out, zoom extents, zoom selection, pan etc.
	Should support display of geo-referenced satellite images
	Should support on-the-fly projection transformation when in multiple GIS data formats are displayed together
Feature mapping	Digitization of all rail tracks, roads, building footprints and other natural and man-made objects through visual interpretation and field verification in 1:2500 scale
	Mapping of point of interests e.g. railway crossings, poles, transformers, public utilities etc.
	Preparation of TIN (Triangulated Irregular Networks) and DEM (Digital Elevation Model) from the satellite imagery and/ or departmental maps for analysis
Attribute data collection:	Collection of attribute data for the features as per the data specification which will be shared after acceptance of the work order
	Attributed data to be collected for all features
	Photographs of the Point of Interest to be collected along with attribute data
	Should be able to perform spatial and attribute query in user defined pre-designed formats
	Should maintain geographic reference of the original GIS data while displaying through internet
Database design:	The data to be stored in a centralized data
	Database level security for updating of data
	Facility to compare data through different versions of the data e.g. for a project it should be possible to compare project data over two different years
	Updating of attribute data remotely through GIS application using user authentication mechanism of Password and UserID
	The data structure should allow integration with other applications e.g. ERP, MIS etc.

Module	Functionality
Web GIS application:	Application should provide a web based interface
	Interface for users to query on attribute data and also make spatial query
	Should be able to display dynamic data and maps over internet
	Entry to the system based on Individual UserID and Password
	Updating of the attribute data and spatial data
	Log of the users who modified data
	Preparation of maps in user defined scale with user defined features for user defined area. The facility has to be user friendly
	Facility for spatial query e.g. select features within buffer, overlay analysis
	Integration with enterprise asset management / project management module with respect to tracking of the assets , projects
Interfacing Requirements	PMS - Section wise Contract Information (Contractor Details, Milestones, Status of Milestones)
	Enterprise Asset Management System - Receive asset details (WIP as well as Commissioned)
	Portal - Primary Interface to users
	Document Management System - Interface for accessing documents.

Document and Workflow Management System

Module	Functionality
Architecture Considerations	The Document management system should be portable to other platforms.
	The system shall support Scalable architecture
	The system shall provide XML based API toolkit for system integration and application development
Document Acquisition Features	The system shall support Bulk Import of image and electronic documents
	The system shall support Direct upload from ODMA Compliant applications
	The system shall support Integration with Mail messaging solution to allow direct Uploading of Emails for corresponding users and indexing on user defined parameters
	The system shall support Scheduled uploading from directories i.e. Folder mapping as so that files from offices can be scheduled for upload.
Archival of Documents	The Document management system shall support categorization of documents in folders-subfolders just like windows interface.
	The Document management system shall provide facility to link cross-related documents like Field report, Grievance and reply sent etc.
	The system shall provide search facility in the same interface, so that users are able to search the documents to be linked
	The system shall support versioning of documents with facility to write version comments
	The system shall allow Locking of documents for editing and importing
Document View	The Document management system shall support Applet for viewing Image documents
	The Document management system shall support for viewing documents in native application
	The system shall provide facility of putting text, graphic and image annotations on document pages
	The Image applet shall support comprehensive annotation features like highlighting, marking text, underlining, putting sticky notes on documents, and support for text and image stamps etc.
	The system shall support automatic stamping of annotations with user name, date and time of putting annotations
	The system shall provide facility for securing annotations for selective users
	The system shall facilitate zoom-in/zoom-out, zoom percentage and Zoom lens to zoom in on a part of image and other image operations like Invert, rotate etc.

Module	Functionality
	The system shall store annotations as separate file and at no time, the original image shall be changed. The system shall provide facility of taking print outs with or without annotations
	The system shall support for Thumbnails on image documents
Collaborative Working	System should allow linking of Documents for cross-referencing related documents Check-In and Checkout support for collaborative working on documents Setting event based alarms and time based reminders
Indexing	The Document Management system shall provide facility to index folders and documents on user-defined indexes The system shall provide facility to set particular fields as mandatory or unique The System shall support Automatic full text indexing for text search Multiple indexes for different types of documents Association of documents and folders with user-defined indexes for easy search and retrieval Filing & Indexing of documents for quick retrieval Facility to add keywords with documents to act as quick reference for the documents
Search and Retrieval	The Document Management system shall provide extensive search facility to retrieve documents or Folders The system shall support saving of search queries and search results The system shall provide ODMA support for search and retrieval The system shall support combined search on Profile, Indexed and Full Text Search The system shall support search for documents or folders on document or folder on profile information such as name, created, modified or accessed times, keywords, owner etc. The system shall support search for documents/Folders using user-defined indexes and document classes The system shall support Full Text Search on image and electronic documents The system shall support highlighting of searched string with a facility to browse between pages for a multiple page document and moving between hit pages The system shall support advanced search using Boolean and logical operators like and, or, greater than etc.
Security	The Document management system shall support definition of Users, Groups and Roles relation in the system The system shall support access permissions on Folders, documents and object level

Module	Functionality
	The system shall support multiple levels of access rights (Delete/ Edit/ View/ Print/ Copy or Download)
	The system shall support system privileges like Create/Delete Users, Define indexes etc.
	The system shall provide LDAP support for integrating with directory services and shall support single sign on
	The system shall support Extensive Audit-trails at document, Folder and for highest levels for each action done by particular user with user name, date and time
Easy Administration	The system shall support web-based administration module for the complete management of system.
	The Admin module shall support Users/Groups/Role definition and granting Access Rights to them and set password expiries
	The Admin module shall provide easy to use interface for Index structure definition that can be used by different Users
	The Admin module shall provide interface for purging old audit trail and do selective logging i.e select the system or application features for, which the audit trails have to be generated
	The Admin module shall provide facility to take complete and incremental backups and shall be able to integrate with third party backup solutions.
Workflow Management	System should provide Workflow functionality for routing and tracking of documents, messages and Forms
	System should facilitate collaborative working on documents in a secure environment through work-items
	System should provide functionality to create Ad-hoc or predefined routes for automatic document routing on sequential / parallel routes
	System should provide functionality to route Work-items to users inboxes for their action i.e. task assignment for each user
	System should have the facility of attaching documents and folders in work items
	System should have the facility to act upon, forward, return or complete Work-items
	System should support functionality of referring Work-items to other users outside the pre-defined route
	System should allow diversion of Work-items to other users for delegating or substituting
	System should provide functionality of setting both time –based and Event -based reminders
	System should have provision of putting shared and secured notes for collaborative working on Work items
	System should support for Printing of the note sheet/ File for reference
	System should support strong Searching, reporting and monitoring of work process and status
	System should provide facility of associating a note-sheet with the file enabling users to comment and review.

Module	Functionality
	System should have ability to Handle Government filing structure & Note sheet View. View for a folder with documents on right hand side and note-sheet on left & support step by step workflow process
	System should allow user to Create a File
	System should allow following actions on a file: add noting view noting add a correspondence/draft for reference configure subject wise checklist link file and precedent cases print noting approve/Reject/Dispose a File
	System should allow Shadow file movement
	System should be able to auto-generate the File Number
	System should intimate on File action (Approval / Rejection)
	System should allow user to generate Pendency Report — Graphical and Tabular format
	System should be able to support file views, Notes, Document listings along with the document viewer on the same screen
	System should be able to create Multiple Links (hyper link look and feel) introduced between notes and documents, notes and notes etc.
	System should have facility to merge other files with existing file
Interfacing Requirements	Project Management System - Workflow for document approval/ archival shall be accessible.
	Project Management System - Document Search facility to be available.
	Enterprise Asset Management System - Workflow for document approval/ archival shall be accessible.
	Enterprise Asset Management System - Document Search facility to be available.
	Financial Management System - Workflow for document approval/ archival shall be accessible.
	Financial Management System - Document Search facility to be available.
	Human Resource Management Information System - Workflow for document approval/ archival shall be accessible.
	Human Resource Management Information System - Document Search facility to be available.
	Provide interface for accessing documents through GIS
	Portal - Single-sign-on sessions details

Envisaged Interfacing Requirement among Applications

The following table describes the interfacing requirement of the applications defined in this FRS document. Blank cell represent 'Nil' Interfacing requirement. The statements in a row describe the data sent by the application represented by the row header to the applications listed in the columns headers.

	Project Management System	Enterprise Asset Management System	Financial Management System	Human Resource Management Information System	Land Acquisition Information System	Geographical Information System	Portal	Document & Workflow Management System
Project Management System		Assets commissioning should be reflected in the EAM.	Payment(s) information to be available in real time for budgetary review. Call appropriate payment processing workflow to process payments as per Contractual Milestones.			Section wise Contract Information (Contractor Details, Milestones, Status of Milestones)	Single-sign-on sessions details	Call appropriate workflow in the DMS for approval & archiving of Designs. Call search facility in the DMS.
Enterprise Asset Management System	Work-in-progress assets to be tracked through the PMS.		Pass Asset Capitalization details for calculation of depreciation & generation of Balance Sheet.			Pass asset details (WIP as well as Commissioned)	Single-sign-on sessions details	Pass Asset Identifier for linking of Asset details such as Design, related Contract, Invoices,

	Project Management System	Enterprise Asset Management System	Financial Management System	Human Resource Management Information System	Land Acquisition Information System	Geographical Information System	Portal	Document & Workflow Management System
								PO/WO etc. Call search facility in the DMS.
Financial Management System	Workflow for payment processing to be available through PMS. Pass payment status & details for monitoring of Financial progress of the projects compared to Contractual parameters.	Pass Asset payment status & details		Workflow for payment processing to be available through HRMIS. Pass details of payment against employee salary and other claims & reimbursements			Single-sign-on sessions details	Call appropriate workflow in the DMS for archiving Invoice, supporting documents etc. Call search facility in the DMS.
Human Resource Management Information System	Employee Information to be available to PMS. Employees to be tagged to Corridors & CPMs.		Call appropriate payment processing workflow.				Single-sign-on sessions details	Call appropriate workflow in the DMS for archiving employee related records. Call search facility in the DMS.

	Project Management System	Enterprise Asset Management System	Financial Management System	Human Resource Management Information System	Land Acquisition Information System	Geographical Information System	Portal	Document & Workflow Management System
Land Acquisition Information System							Single-sign-on sessions details	Call appropriate workflow in the DMS for archiving published notifications, G.O., etc. Call search facility in the DMS.
Geographical Information System							Single-sign-on sessions details	Send request for documents.
Portal	Primary Interface to users	Primary Interface to users	Primary Interface to users	Primary Interface to users	Primary Interface to users	Primary Interface to users		Primary Interface to users
Document & Workflow Management System	Workflow for document approval/ archival shall be accessible. Document Search facility to be available.	Workflow for document approval/ archival shall be accessible. Document Search facility to be available.	Workflow for document approval/ archival shall be accessible. Document Search facility to be available.	Workflow for document approval/ archival shall be accessible. Document Search facility to be available.	Workflow for document approval/ archival shall be accessible. Document Search facility to be available.	Workflow for document approval/ archival shall be accessible. Document Search facility to be available.	Provide interface for accessing documents through GIS.	Single-sign-on sessions details