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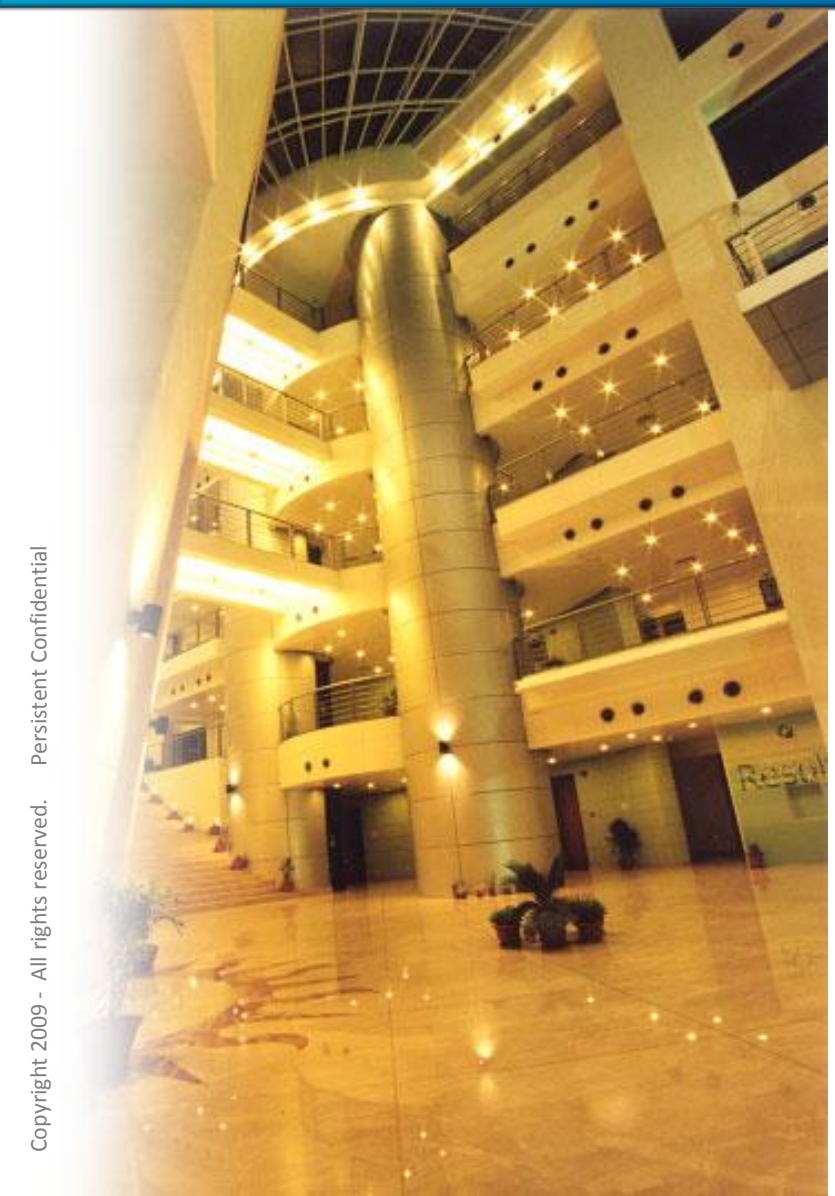

Persistent Systems Ltd.

CMS implementation for IUCAA and NCRA

August 27, 2010

Capturing the Project Requirements

Let's start: The First step is to capture the overall IUCAA/NCRA expectations and project requirements

Customer	**IUCAA & Girawali and NCRA at Pune University Campus**
Domain, Technology	**GUI Development ,XML and database management**
Project Scope	**To develop a new CMS encompassing at a high level control, data acquisition, monitoring and user interface functionality respectively for their 2m optical telescope at Girawali and 15m radio telescope at NCRA campus, Pune University**
Out of Scope	**• Procurement of Platforms deployment of CMS, including servers, operating system, run-time environment and tools** **• Development of Hardware engineering modules like servo module, CCU Module** **• Wrapper layer for each hardware engineering module**
Implicit Requirements Area	**To develop a new Central Monitoring Service encompassing at a high level control, data acquisition, and monitoring and user interface functionality for optical telescope and radio telescope**
Acceptance Criteria	**Reviews followed by the successful execution of UAT at IUCAA and NCRA**
Validation / Certification	**UAT to be performed after deploying the CMS on Optical as well as Radio telescope**
Resource / Skills	**Java EE 5, Rational database – MySql, Application/ web server**
Model	**Fixed Price**
Constraints	**Timely Review feedback and availability of the wrapper layer as well as the system hardware**
Expected Completion Date	**15-Apr-2011**
Specific Quality Standards	**Persistent CQM for project management and Documentation templates as per IUCAA/NCRA standards**
Life Cycle Model	**V- Model**

Identifying Hardware, Software, Resource Skills Requirements

This is to capture Hardware, Software and Human resource requirements

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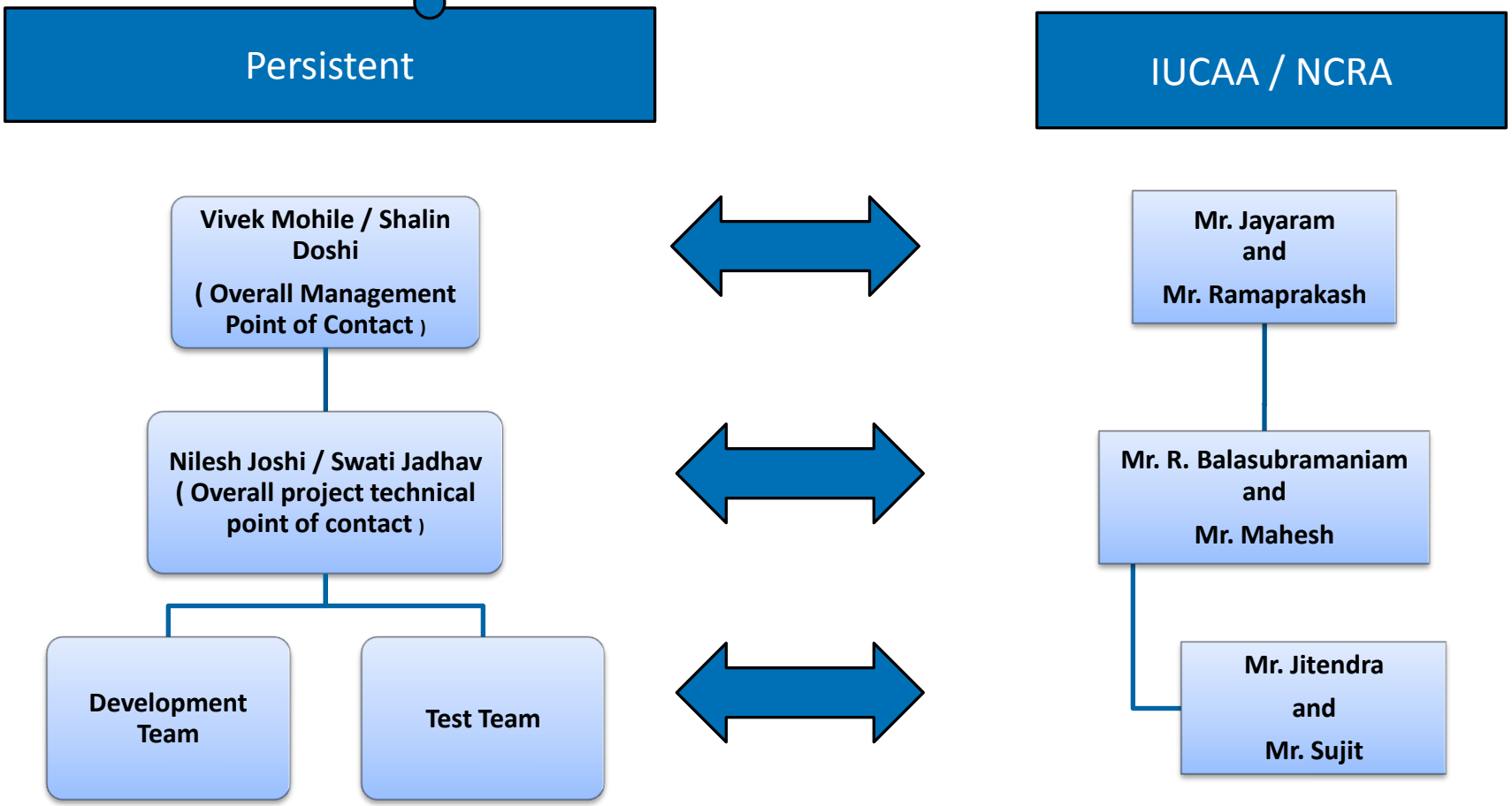
Server	Geronimo platform from Apache which consists of an Apache web server and an Application server licensed for Java EE 5 based on Tomcat which has an extensive deployment history and support in the open source community
Link	Secure FTP : ftp2.persistent.co.in/
Tools – Software	• Java EE 5 • Eclipse development environment together with needed plug-ins for Geronimo development / C++ etc. • Abbot – GUI and Performance Testing. • XML • Relational Database – MySql
Hardware	• Hardware modules such as CCU, TCS for the unit level testing for the respective software module • Existing Optical and Radio Telescope system available for Integration and acceptance testing

	Technical (Domain, Language, Tools)	**Management, Process**
A Dedicated experienced team is allocated for executing this project including 1 senior architect and a project manager for smoother execution of project and assure high quality technical solution. There will also be a quality consultant available to monitor the overall project execution processes and assuring high quality delivery. All the reports will be shared periodically with IUCAA / NCRA.	Java EE 5, Rational database – MySql, Application/ web server	Reviews, Configuration Management, Defect tracking, Project Management

Defining Project Team Structure

Having Execution model defined, the team will be formed with defined roles and responsibility



Defining Roles & Responsibilities

Clearly defined Roles and Responsibility in FP delivery model plays important role for smooth operations.

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Role	Responsibilities
Account Manager (Vivek Mohile)	❑Managing IUCAA / NCRA Satisfaction, Feedback, Escalations if any ❑Hardware, Software, Human Resource for the IUCAA / NCRA project ❑Overall Project health Management (Quality, Efforts, Schedule, Cost etc)
Project Manager (Shalin Doshi/ Nilesh Joshi)	❑Project Management (Planning, Tracking) with respect to schedule, effort, cost and Quality ❑Requirement Elicitation, Estimation and Change Management ,Team Management, Knowledge Management ❑Quality Assurance, Process adherence ❑Customer Communication, Issue and Risk Management ❑IUCAA / NCRA Project delivery ownership
Technical Architect (Swati Jadhav)	❑Java EE 5, Database Expert ❑Consulting project team for design, issues ❑Alternate Design, Test model's evaluation, analysis, solution ❑Developing design, overall system architecture
Quality Consultant	❑Software Configuration Management, Risk and Change Management ❑Quality Audits, Process Definition, Customization and Adherence ❑Life cycle stage specific checklist adherence. ❑Matrix Data Analysis, Causal Analysis, Improvement Planning, Defect Prevention.
Development Team	❑Code implementation in Java EE 5, Rational database – MySql Application/ web server ❑Raising early issue to Architect on design specific issues ❑Metrics Data Collection (timesheet and defect data)
Test Team	❑Integration, system testing, Documentation as per standards and task allocation by Architect ❑Generating test report, retesting
IUCAA/NCRA	❑Periodic Reviews and acknowledgement for Persistent deliverables ❑Support to understand the existing system and wrapper layer during initial phase of the project ❑Support to Ramp the Persistent team for building the domain and product specific knowledge ❑ To provide all the infrastructure for every phase of the project and active involvement of IUCAA/NCRA Engineer for Integration and User acceptance Testing

Milestones and Schedule

The important part of the Project

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- **Phase-I**

Milestone	Planned Date	Dependencies
Completion of Design and Database Schema	07-Oct-2010	❑Freezed Requirement Document ❑Design document templates ❑IUCAA/NCRA to clarify required technical notes/documents and queries from PSL
UI prototype Look and Feel	07-Oct-2010	❑Support form NCRA/IUCAA to ramp up the Persistent team for building the domain and product specific knowledge ❑ Periodic Reviews from IUCAA/ NCRA
Review of UI Prototype and database tables by IUCAA/NCRA	28-Oct-2010	❑PSL to Submit the Design and Database schema ❑ Submission of the initial proto for UI and database tables
Phase-I - Implementation Complete	03-Dec-2010	❑ Go ahead for the design and UI from IUCAA/NCRA ❑ Availability of all Hardware, tools and Server
Test plan Development	23-Dec-2010	❑Test plan templates ❑Go ahead for the design and UI from IUCAA/NCRA ❑Freezed Requirement Document
Testing and Test report delivery	29-Dec-2010	❑Availability of all Hardware, tools and Server ❑ Go ahead for the design and UI from IUCAA/NCRA ❑Approval of Functional and Integration test plan from IUCAA/NCRA
Review of Test results by IUCAA /NCRA	07-Jan-2011	❑Submission of Test Reports from PSL
Phase-I Completion Milestone	07-Jan-2011	❑Periodic reviews on PSL deliverables from IUCAA/NCRA ❑ Availability of all Hardware, tools and Server

Milestones and Schedule

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- **Phase-II**

Milestone	Planned Date	Dependencies
Phase-II - Implementation Complete	25-Feb-2011	❑Go ahead for Phase- I completion from IUCAA/NCRA ❑ Availability of all Hardware, tools and Server
Completion of Functional Testing	08-Mar-2011	❑ Approval of the Test plan from IUCAA/NCRA ❑ Availability of required system and infrastructure
Completion of Integration Testing	30-Mar-2011	❑Approval of the Test plan from IUCAA/NCRA ❑ Availability of required system and infrastructure
Phase-II Completion Milestone	30-Mar -2011	❑ Go ahead for Phase- I completion from IUCAA/NCRA ❑ Availability of all Hardware, tools and Server
Reviews and completion of User acceptance Testing	15-Apr-2011	❑ PSL to submit all the deliverables ❑ Availability of Complete system at IUCAA and NCRA facility ❑ Successful execution of the UAT

Identifying Critical Success Factors

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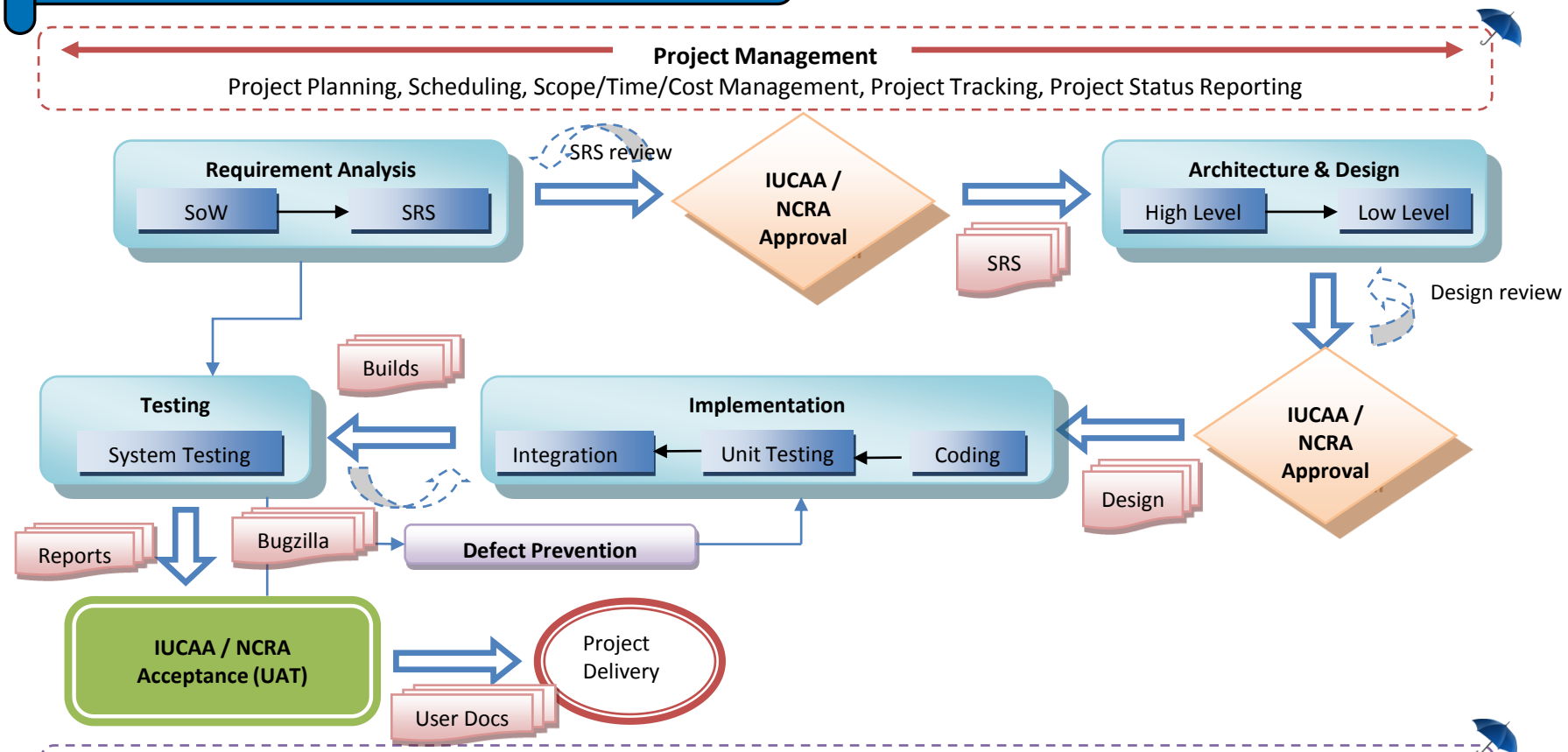
Identifying Critical success factors and Execution Risks at Very early stage is extremely important.

Sr. no.	Success Factor	Remark
1	Technical skills	Persistent has JAVA and database expert team with similar required experience for the project
2	Communication	Crisp and clear communication, Early warnings, Detailed weekly report
3	Schedule	Adhering agreed project schedule with respect to dependencies
4	Integration with existing system	IUCAA/NCRA support on system integration, hardware availability at expected timeline
S	Quality Assurance / Standards adherence	Stringently adhering project specific coding standard. Allocated quality consultant to monitor the overall project execution processes and assuring high quality delivery

Delivery Process Flow

Summarizing Execution Process Flow (Review, Quality Assurance, Defect Prevention and Project Monitoring



Defining Customer Communication and Escalation Plan

Effective and Transparent communication is key to any relationship

Type of Communication	Objectives	Frequency	Participants / Recipients	Records
Weekly Project Status Report	•Project Schedule Planning, Efforts, Milestone, Risk, Dependency, Issue Tracking •Change of Requirement and Impact if any	Weekly	Shalin Doshi, Nilesh Joshi, Swati Jadhav, PSL Team, IUCAA/NCRA team	WSR
Monthly Project Review	•Schedule and Milestones status •Resource Status, Quality Status •Project Dependencies, Risks •Customer priorities changes and plan •Client Feedback, Improvements	Monthly	Vivek Mohile, Shalin Doshi, Sales Team, IUCAA/NCRA team	Monthly PPT
Customer Satisfaction Feedback	Customer Quarterly Feedback on the following aspects •Technical, Managerial, Resources, Communication, Quality Feedback Analysis, Corrective and Preventive Actions	Yearly	Vivek Mohile, Sales Team, IUCAA/NCRA team	Customer Satisfaction Survey Report

Escalation	Trigger for Escalation
Level 1	If the issue is not addressed within 2 working day of incident reporting.
Level 2	If the issue is not addressed within 5 working days of incident reporting and after L1 escalation.
Level 3	If the issue is not addressed within 7 working days of incident reporting and after L1 escalation

Escalation	Contact Person	Contact Details
Level 1	Persistent: Shalin Doshi	shalin_doshi@persistent.co.in
	IUCAA : Mr. Sujit Punnadi NCRA : Mr. Jitendra Kopilkar	sujit@iucaa.ernet.in jitendra@ncra.tifr.res.in
Level 2	Persistent: Vivek Mohile	vivek_mohile@persistent.co.in
	IUCAA : Mr. Mahesh Burse NCRA : Mr. R. Balasubramaniam	mpburse@iucaa.ernet.in rbalu@ncra.tifr.res.in
Level 3	Persistent: Gyana Pattanaik	gyana_pattnaik@persistent.co.in
	IUCAA : Mr. A.N. Ramaprakash NCRA : Mr. Jayaram Chengalur	anr@iucaa.ernet.in chengalur@ncra.tifr.res.in

Dependency / support required

Dependency	Milestone
Support to understand the existing system and wrapper layer during initial phase of the project	Design and Proto development
If required, providing clarifications for the requirements during initial phase of the project	Design and Proto development
Support to ramp the Persistent for building the domain and product specific knowledge	Design and Proto development
IUCAA/NCRA to provide the Platforms for deployment of CMS, including servers, operating system, run-time environment and tools based on the specification provided by Persistent	Phase-I Implementation
IUCAA / NCRA to provide the Apache web server	Phase-I Implementation
IUCAA/NCRA engineers to provide the details of the wrapper layer for each engineering module. PSL team and IUCAA/NCRA to work together during the deployment of the CMS system	Phase – I and Phase – II completion
Support and involvement of IUCAA/NCRA Engineer during UAT	Phase – I and Phase – II completion
Periodic Reviews and acknowledgement for Persistent deliverables	Phase – I and Phase – II completion

Queries and Action Items

Action Item	Date	Owner
Needs clarification and expectations related to wrapper layer	23-Aug-2010	IUCAA/NCRA Team
To provide the contact details of IUCAA/NCRA Engineer for wrapper layer so that PSL can communicate for any queries	23-Aug-2010	IUCAA/NCRA Team
Initially PSL team may required to visit IUCAA/NCRA site frequently to understand system and requirements. So IUCAA/NCRA and PSL needs to complete any formalities if required e.g. Temporary gate pass at IUCAA/NCRA facility	27-Aug-2010	IUCAA/NCRA and PSL team
IUCAA/NCRA to provide the Platforms for deployment of CMS, including servers, operating system, run-time environment and tools based on the specification provided by Persistent	03-Sept-2010	IUCAA/NCRA Team

- Detailed Query List

Risk Analysis and Mitigation

Execution Risks at Very early stage is extremely important.

Sr. no.	Risks	Mitigation
1	Changes to scope that result in increasing the timeline and effort	Persistent will identify the grey areas / specifications with potential for change in advance and discuss the same for confirmation. All changes requested will be strictly put through the change management process and taken up for implementation only after higher level approvals by IUCAA / NCRA
2	Delays in sign-off on design / test plans / test results, user documentation, or requested information / clarification	Persistent will highlight / escalate the delay and its impact on the project plan right away and request senior management to resolve the same.
3	Non-availability of hardware modules such as CCU, TCS etc. for the unit level testing for the respective software module	Persistent will provide a detailed schedule well in advance to indicate the requirements to IUCAA and NCRA. Further any delays that appear to be taking place will be raised as escalations in the status report to the respective management teams.
4	Failure of hardware	Redundancy / spares availability should be ensured by NCRA and IUCAA
5	Wrapper software modules for each hardware module should be ready and defect free	Persistent will provide a detailed schedule well in advance to indicate the requirements to IUCAA and NCRA. Further any delays that appear to be taking place will be raised as escalations in the status report to the respective management teams.