



OFFSHORE OUTSOURCING OF MAINTENANCE AND QA PROJECTS

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Maintenance and Quality Assurance projects are well suited for remote outsourcing. Of the \$6Billion Outsourced projects from India a majority relate to Maintenance and QA projects. These projects present low risk outsourcing as the level of interaction needed is significantly lower than a development project. Further the specifications or requirements do not change as in development projects. This frees the remote team to focus on the job in hand. This also provides the Outsourcing Company a low cost alternative to managing Customer satisfaction and product quality.

IT Maintenance services differ slightly from traditional system software maintenance. While trouble reports from System software are more coordinated and scheduled releases, IT systems report trouble issues when they occur. They are required to be looked into and repaired. Communication is an important element of Software maintenance projects. Here, the Onsite team can interact

with users in real time and analyze the problems. They can confer with the offshore team and try and arrive at a solution before the next day.

IT systems may require 24x7 support. The staff has to be on call to respond at any time to resolve a problem. Such systems can be efficiently supported:

- Operations staff has to be provided phone, pager, names and schedules of the members of the On-Call team. The on-call person may be onsite, offsite or offshore. The Call procedure should be seamless. Offshore on call staff should be managed through a local number. The call could be forwarded to the offshore team. If a dedicated link is used the call transfer to the offshore team can be made seamless and would register like a local call.
- The Remote team should be able to access local resources to investigate the problem.
- A formal escalation process should kick off escalation events after certain intervals. At times solution providers may have to be on call to identify or resolve problems in their packaged solutions.
- The Onsite team should work closely with the offshore team in identifying the problem.
- The Offshore team should get privileged access to the production data to be able to analyze the problem.

As a process the local team may be authorized to handle emerging problems whereas batched trouble tickets that have been pending may be handed over to the offshore team.

The changes made to the application need to be tested and staged before merging onto the production system. The process needs to be managed effectively. This can be done by creating a parallel production environment and testing the fixes, performing a systems integrity test and only after this has passed releasing it to be upgraded on the production system. The Source Code Control Management system, Change control Management system, trouble ticket management system and the issue management systems have to be tightly controlled.

In a normal circumstance change is more controlled. Changes go through a rigorous design acceptance and change process. However, emergency problems have to be managed differently. Emergency problems cannot wait for formal design review cycles or approvals. The Escalation process should take into account this need to check in emergency work around. The process should identify key individuals who can be quickly brought in to clear and approve design changes and upgrade to the production system.

OFFSHORE MAINTENANCE PROCESS- PHASES

PHASE 1: PLANNING AND PROCESS DEFINITION

The Planning and Process Definition phase sets the stage for taking the Project Offshore. This phase involves:

- An understanding of the Maintenance process as it exists, the trouble management system, reporting system, trouble ticket logging systems, Service level categories, Call support process, detection and identification process, documentation, current design and coding process, problems escalation process, testing processes. All the processes are mapped, as they exist. The objective is to emulate the existing environment with the least changes.
- An understanding of the Systems and applications to be maintained. Business and technical knowledge transfer assessment. The team would meet with the subject matter experts to chalk out a detailed knowledge transfer plan. Subsequent meetings will be held for code walkthroughs
- The team will do a feasibility study and estimate what should be done offshore and what would be done Onsite.
- The team would create ideal consultant profiles and assess the duration and level of training needed.
- The team would nail down the type of Corrective, Enhancement or Adaptive services that is required to be done. Adaptive services may include performance tuning also.
- A resource list will be finalized. This identifies physical equipment, hardware and software, that would be needed Offshore.
- Build a Maintenance Plan. The Maintenance plan would spell out the activities that would be done Offshore and those that would be done Onsite. The Maintenance life cycle process would be mapped. Service levels and metrics would be spelt out. The Project Managers and Project leads would be identified and contacts exchanged. The chain of responsibilities would be fixed. A process of defining a service level would be initiated and a target service level goal would be set. It is expected that the two sides would reach a good understanding on desired metrics and service levels within 3-6 months of the engagement.

PHASE 2 - KNOWLEDGE TRANSFER PHASE

The knowledge transfer phase kicks off the offshore plan.

- The team is brought onsite for knowledge transfer; systems, application and process knowledge needs to be transferred to the Implementation

team. The engineers start with user level training, they study how the systems are installed and understand all features and functions. (In the case of IT they familiarize themselves with Business processes). The team studies the Maintenance process as it is implemented in the Organization. Next the system architecture and software is studied.

- The team examines all documentation to understand state and level of documentation. One of the goals of Maintenance is to complete any incomplete documentation or to document code that is encountered as much as possible. Such documentation facilitates knowledge transfer to new team members. This will allow a better analysis when performing enhancement services. The process of making documentation current or enhancing code documentation gives a better understanding of the system and would help in resolving problems quickly, improving system performance and help build more test cases to cover portions of the code.
- In the case of IT the documentation is updated / prepared for Data Models including E-R diagrams and dictionaries, process models including functional decomposition diagrams and business rule descriptions, cross reference between data and process models including I/O diagrams and systems and component interface definitions. A document that details the system overview, functional description, system organization and interaction with other system is created or made current. The functions are classified, menu organization, relationships between tables and screens, tables and reports, batch jobs are all documented. List of files, symbols, data structures are also documented.
- All trouble tickets are categorized with complexity levels associated – Simple bugs, Medium complexity bugs, Complex bugs and a severity codes is tagged with each.
- The team takes a subset of simple bugs and tries to resolve them Onsite. This is the learning process and the team understands the process involved in problem identification, analysis, fixing and release.
- The team prepares itself for transitioning the Maintenance system from the customer to the implementation team. The team takes more complex bugs and fixes them onsite. Some enhancement feature is also taken up for implementation. This allows the team to understand the process of making feature enhancements. The team would involve itself with Systems Integrity test to understand how a release is validated and then released for production.
- A demarcation of what will be done Onsite and what would be done Offshore is defined. In most instances the Company provides Tier 1 and some Tier 2 support leaving Tier 2 support to the Outsourcing Company.

The team is now ready to start the Offshore Maintenance phase.

PHASE 3 – OFFSHORE MAINTENANCE PHASE

The Offshore phase starts with setting up the offshore environment with the equipment.

The Offshore Maintenance team is assembled.

Do not expect the team to go live and productive right away. The team requires training and behavioral transition in:

- Understanding of the business processes
- Understanding of the Application
- Understanding of the Trouble Resolution process
- Check in/ Check out of trouble tickets
- Software system and documentation
- Service procedures
- Communication related issues
- Culture sensitization including soft skills enhancement (communication, interpersonal) for consultants interacting with overseas client

The Offsite team relocates to a remote facility and repeats fixing of a certain smaller set of low, medium and complex bugs. This is a shortened cycle to study how the fixing and check-in, check out process works.

Some process problems may be uncovered during this phase. There are other issues as well. Staff motivation is an important part of the process. Engineers have to be kept motivated to continue the maintenance work. Staff turnover can be very high if engineers are not motivated. The engineer motivation can be maintained by several methods:

- Job Rotation – engineers work on Enhancement services, Maintenance services and Adaptive services (and not just on one type of work)
- Trained Engineers who show good promise can move to more challenging onsite or offshore assignments
- Recognition and Benefits based on service level achievements at individual levels
- Face to face interaction with customer

The team agrees initially on service level goals. It is very difficult to immediately set service levels. The process is learned and over a period of time concrete service level goals can be established and enforced.

The roles and responsibilities of the team should be documented. The process manual should identify what will be done Offshore and what would be done Onsite. Responsibilities are identified to the Onsite team, offshore team and the Customer team:

ON-SITE Implementation Project manager

- Generate Functional Requirements for any enhancement services
- Understand adaptive changes needed and talk to solution providers if needed
- Coordinate the process between client and Offshore team
- Single point of contact with customer
- Configuration Management (Check in/ Check out) process owner
- Interface with Help Desk or User to nail down problems that are not repeatable.
- Review and represent company in meetings
- Fix certain types of troubles (that may not be possible offshore due to lack of certain type of computing resources)
- Categorize Trouble tickets to complexity and severity and prioritize with the customer the implementation schedule.

OFF SHORE Project manager and Project Lead

- Receive trouble tickets and any change request or enhancement service request
- Allocate problems to team
- Prepare status of bug fixes for the current and next two weeks
- Validate repeatability of problems and suggested design change
- Manage the service level, create an escalation process so that senior members automatically involve if a problem is not resolved in a certain time.
- Ensure quality of the deliverable
- Project management, status, reviews and reporting
- Managing team and team morale

OFFSHORE QA Team

- Prepare System Integrity test schedule
- Enhance test cases and test bed for better coverage
- Proactively identify problems and enter them into the trouble system
- Validate all releases

OFFSHORE AND ONSITE Team Members

- Repeat problems
- Identify and analyze cause
- Suggest design change
- Repair all approved trouble tickets
- Document modules and systems encountered
- Send Test case upgrade request or suggestions to QA

INFRASTRUCTURE Team

- Manage the Systems and Networks
- Manage access and security
- Backup and Restore
- Data Base Administration
- Configuration Management

OUTSOURCING Project Manager and Team

- Allocate, prioritize trouble tickets and participate in determining complexity and severity
- Identify suitable Enhancing projects and determine client requirements
- Measure Outsourcing operation and service levels
- Provide subject matter expertise when needed
- Analyze and approve design change requests
- Coordinate check in of fixes
- Coordinate client system integrity test and provide deliverable approvals
- Schedule release of fixes
- Maintain source control branches and ensure that relevant modules are available with the Offshore team
- Review test case for test bed enhancement

SOFTWARE METRICS FOR MAINTENANCE

What cannot be measured cannot be improved. A project can have several measures associated with it. Here are some guidelines:

- Modules completed by type
- Test cases executed by system
- Productivity of team and individual
- Average Trouble Tickets fixed on complexity
- % Trouble Tickets fixed to existing Trouble Tickets (Release change Ratio)
- On time performance

- Mean time to repair from report of emergency Trouble Ticket and routine Trouble Ticket
- Cost per fix
- % Improvement in system performance
- Defect density
- Detection efficiency
- Removal efficiency
- Average fixes per period
- Time lost due to improper fix
- Return on Investment
- Cost reduction per fix
- Improved customer satisfaction
- Improved time to market

Arbitrage may offer a low cost and attractive proposition for remote software projects, however Outsourcing companies should not lose sight of the work in progress. There should be a rigor and this rigor needs to be maintained to ensure that quality and productivity go hand in hand. Outsourcing Companies should implement proper processes for problem identification, audit, suggested changes approvals and the implementation and the integrity test. Further someone should be assigned to ensure that trouble tickets are identified, prioritized and sent to the remote development team.



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