Requirements Engineering in Global Teams

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# Executive Summary

This report intends to share the experience of handling requirements in a Global Team in the capacity of a Senior System Analyst (Application Owner) for an application used in Asia Region countries. The experience includes challenges faced due to

1. different stakeholders such as Product Owners, Business Analysts, Technology Partners, Infrastructure Mgmt. Team, etc. located in different geographical locations such as Hong Kong, Singapore, Paris, London, Spain & India (Mumbai, Chennai)
2. Overwhelming number of requirements received from different stakeholders for different Projects to be delivered in the same release period
3. Negotiating Requirements with different stakeholders
4. Remote Development, QA & User Teams spread across locations (In-House Development)
5. Other Constraints due to lack of System Knowledge(AS-IS), Existing Country Specific Implementations leading to increase in development effort in regional Enhancements (implementation for multiple countries) / Overhauling Projects in question

# Projects

My company is a Global bank providing Cash Management Solutions such as Payments, GIRO, Cheque Issuance and Collection, Bill Pay, Payroll Processing etc. to Corporate Clients in Asia Region using Payments hub application. A lot of applications are integrated together with the hub for different functions such as Balance Check, ERP Integration with Client Systems, etc.

A Program was initiated to replace this legacy version of the existing hub with the latest version implemented on bleeding edge technologies which could increase the ease of enhancing the system based on business needs & also to strategically perform a complete overhauling of a few systems tightly integrated with the hub to solve existing operational issues, to sunset legacy and redundant applications and replace them by other existing Regional Applications. Under this program, New Platform would be adopted for one country at a time – starting with India, Followed by Singapore, Hong Kong, and other Asia Countries. This massive program involved overhauling of at least 15-20 applications.

One of the legacy vendor products used for Cheque Processing was already out of Vendor support but had to be integrated into this newer version of the payments hub. An Application that I took over just weeks ago – An Asia region Cheque Printing Solution used for Singapore, Hong Kong, Thailand and 5 other countries – was strategically identified as the system that would replace the legacy solution for Cheque and Collections used in India, since it wouldn’t make sense to invest or build on a dying application. This Application will be integrated with the new version of the hub for India & all other Asia Countries in near future.

Since it was a country-wise rollout, this application is required to support both the versions of the hub based on the countries. In addition to 30+ Requirements provided for supporting the new platform, it was required to consolidate the existing country specific requirements for all the Asia countries as an Integrated Regional Implementation. This means, business rules which are handled separately for individual countries and were partially redundant will be dropped and all the rules will be developed as a common rule that can be enabled or disabled for any country.

The L0 estimate or the initial high level estimate for the Project was close to 850+ Man days only for Coding and Unit Testing. Besides, Estimates had to be considered for System Testing, Integration testing, Performance Testing, Data Migrations, about 15-30% deviation in actual effort from the Projected L0, Additional Change Requests. Project Cost seemed to be so high considering the Budget and Capacity.

In addition to this Major Revamp, there were few other Projects to be handled such as Revenue generating Client Implementations (40+ MD) that required some customized reports to be developed, Regulatory Projects (80+ MD ), Problem Tickets, Production Issues and any unexpected issues due to these Project releases.

# Problems faced during the situation

* Biggest Issue was Capacity Planning. Development Partners had only one half developer and half tech lead (Half because of Resource allocated on a sharing basis). Team had to be ramped up and trained on the Projects.
* To make things worse, there hasn’t been much changes in the system since it was first built 5-6 years ago and all the experienced Leads who developed the system had moved out. There were no Functional Specifications, System Design document, User guide, Technical Specification, etc. As per the company guidelines, System Analysts will not have access to code.
* With Just access to Application, Database and File System, eliciting requirements was a serious challenge. System AS-IS was not clear. With such major overhauling and other projects stacked up – Coming up with a precise assessment was paramount to plan the delivery, to negotiate and size down the requirements. Everything had to be built from ground up.
* With about 1000+ days required for only one major Project, and with a need to deliver other Projects within the given overall budget of 650 MD was a challenge even after boosting the Team strength based on the timelines for each of the Project.
* To handle this situation, Requirements had to be sized down & negotiated in each of the projects to ensure key business requirements are delivered. There was no problem identifying the stake holders and was known for each of the project. Stakeholder for each of the projects belonged to different Business Units & located in different geographical locations and had to negotiate separately for each of the Projects.
* Yet another challenge was on Planning the Delivery. With Target Budget of 600 MD (50MD secured as a buffer), A draft timeline has to be published initially for all the projects to commence the negotiation on the timelines for the delivery. Requirements from Business / Users had to be really justified to be taken up. Communicating this with different & independent stakeholders and convincing them was the task cut-out.
* To accomplish all this, I had roughly 3 months –to get the solution approved by different stakeholders & Management, to finalize the Functional specifications for all three projects, and to publish the agreed timelines with all the stakeholders.

# The resolution to the problem faced

**Issue 1 – Development Team Strength:** ODC Development Team was ramped up with the help of ODC Managers. A Separate Project Manager was appointed to oversee the Progress of the development on a daily basis. A Project Governance was established in which – Senior Systems Analyst will participate in weekly meeting to understand the progress and clarify on specifications if necessary. A Bi-Weekly Status meeting conducted between ODC PM, Senior Systems Analyst and Management in Singapore to Track the Progress.

**Issue 2 – Assessment:** With No Knowledge about the system behavior, Assessment was a daunting task. Understood the Industry Best Practices & Reached out to the Operations of different countries separately to confirm on the given standard operating procedure and provide inputs on the functions that were frequently used. For a lot of other functions, Know-how was identified by conducting Analyst Testing and cross check the Input to the system with the processed result from the system and confirm the same with the Developers by performing code audit. For Backend Tasks, AS-IS was documented based on the Knowledge collected from known facts and Developer’s code analysis. Such techniques helped speed up the whole process of Requirements assessment & elicitation.

**Issue 3— Planning:**

With a lot of requirements from three different stakeholders and capacity issues, we had to obviously come up with a strategy to deliver. Planning was a challenge.

For Malaysia, Singapore and Hong Kong had their requirements for 400+ days. Client Implementations team s requirement was for 40 days. System revamp required 1000+ days.

Once the assessment was complete and after understanding a high level estimate for each of the requirement, multiple rounds of rigorous discussions were conducted with different stakeholders separately to understand the priority and importance of each of the requirement.

Each requirement was identified as ***good to have*** and ***must have*** and was prioritized as ***High, Medium & Low***. A score was given on each of the requirement based on the cost-benefit analysis and requirements were shortlisted to be delivered. Discussion was taken to management and escalated to all levels to take up only High and Medium Priority requirements that are Must-Have. All Good-to-Have features were promised to be delivered at a later point in future. Delivery Plan was finalized and published.

Client Implementation took the highest priority with 30 Man days effort (Almost the same effort as originally estimated) and was delivered first.

Second was the regulatory project and was delivered with 50 Man days effort (Down from 300+ Man days). A lot of requirements were in addition to regulatory mandated and was promised to be delivered in the next calendar year for SG, HK, MY.

Getting to the meat of the lot, the effort System Overhaul was reduced to 600 Man days from 1000+ Man days after several rounds of discussion with Stake holders and Business Owners of India and agreed with the stakeholders of Other Regional Countries such as Singapore, Malaysia, Thailand, Hong Kong etc. as they were next in the pipeline. So the requirements were reduced / simplified in line with regional countries and only specific customizations were taken up. Same would be followed for other countries’ implementation. Requirements from the existing legacy system was dropped and a new Operating procedure was accepted based on the agreed requirements.

This reduced the cost of implementation drastically and easy on system maintenance. Also, this enabled us to stick to the schedule of the bigger program (Payments Hub Revamp). Otherwise, we were at the risk of delaying the whole program.

System was also fixed for existing performance bottlenecks to meet India s high volume and growing business of regional countries. The releases were broken down and delivered in a staggered manner. Requirements were broken down to be delivered into three parts:

1. Core features such as Transaction management for Integrating with Other Systems since Other Systems were expected to be ready in a month s time for cycle 1.   
   DB Schema and data migration was included so that data set ups are maintained well in advance and don’t change in subsequent releases
2. All UI changes were planned to be released in another month and can be tested separately along with the core module in cycle 2
3. Last release accounted for most of the data downloads and Reports and covered in cycle 3

Reconciliation of the test results was planned at the end of cycle 3 testing and for any interim verification or static data set up – Development Team or the Business analyst will help to create necessary maintenance from the backend. Testers and Developers were educated accordingly. All the infrastructure management Teams (Cloud, Linux, DB, and Middleware) in Europe were given a heads up about the project plan since they require a month’s lead time to prepare the environment. Revamped version was planned to be deployed as a separate instance. The original instance would still be up as a fall back for existing countries and to verify AS-IS behavior in the mean time before the project is live.

The stage was set for the development team to step up and deliver.

Performance and Security scanning was scheduled at the end of SIT after all three releases are completed to ensure the build released for users follow the right design.

Client Implementation went well and was on boarded as per the planned schedule. Regulatory Project was successful with no incidents or issues.

System Revamp Delivery was delayed by a month and a half due to different issues. Although this delay did not impact much as the bigger program was held up due to other severe issues, it was still hard to justify the delay. Let’s look at the root causes and lessons learnt.

# Lessons Learned

* Unexpected long leaves of Critical Team members in both Development and Testing Teams caused some delay. Only Planned leaves were factored into the project plan.
* There was a cascading effect on all the releases as the approach was staggered. Re-planning and reorganizing to accommodate the delays was cumbersome
* Ad-hoc activities popped up more than it was expected. Activities such as Critical MAS regulatory security fixes for Java and Struts based application, change in security Protocol, Linux and DB Patch updates, Few Production issues that required immediate fixes to name a few – Impacted the timelines. The buffer taken into account was not adequate.
* Impact Analyses was not fool proof. Merging those country specific Business rules together as a regional logic for all countries was buggy and took some rework to fix. An experienced developer who could has handled such complex scenarios or some prior documentation would have been handy. With that, a clearer and understandable specification could have been produced for such modules.
* Few of the changing requirements which were communicated to development leads and Project managers was not communicated to developers properly. They ended up developing based on older version of documentation. Defects of such gaps were identified during testing and fixing them took a while.
* Testers and Developers found it a bit hard to adopt to this staggered release or a bigger Agile Kind of Sprint as they were new to such working models. Although a lot of meetings and discussions were arranged to help them, Walkthrough could have been provided in person, face-to-face. There would have been more room to clarify and interact with the team closely and set the tone right before starting the development and test scripts generation.
* Development and Testing Teams were also working from different remote locations and were caught firing at each other when there were lot of bugs or understanding gaps on either side. An in-person discussion during the walk through would have built some good rapport and empathy towards each other.
* Although Project delivery was successful, it could have been a lot smoother. Adopting the above adjustments could have made things easier.
* There were a lot of existing system issues / design issues that were not known and it sucked up some time to fix the required ones. Others were documented as known issues and had a workaround solution. Considering the constraints and the situation, a little more buffer should have been considered during the planning phase
* There were also regular / routine lessons learnt such as Coding Issues, BA Gaps, miscommunication, etc. were documented and do not require an explicit mentioning here.

# Conclusion

To summarize, Working in Global Teams can be really challenging at times particularly when a lot of Teams and stakeholders were involved. Requirements are driven based not only on the Features required – Cost Benefit Analysis, Capacity to Deliver, Priority and Urgency of the requirement, Capacity and limitations of the current system, Timelines for the delivery, Roadmap of the application, etc.

All these things would have to be considered, to understand the big picture and to make an informed decision to contribute to the true success of the business from an IT Point of view.