Robotic Warehouses, Alien Domain, Offshore developers, Visionary customer : Saved by agile

Vinodhini Tharaneetharen
Exilesoft (Pvt) Ltd
18-12-2013

Background

Exilesoft is a software outsourcing company in Sri Lanka, practicing Agile in its day to day business activities. In this report we talk about a project we have been engaged in, with Element Logic AS, a Norwegian company which owns an automated warehouse management system. When the customer approached Exilesoft to be their off-shore partner, they already had a legacy application which was installed and was being used at many of their customer sites.

This project requirement was to introduce a new framework with three-tier architecture using C#.net, and to build new features for Element Logic's existing customers and new customers. The scrum master was appointed from the Element logic side, 2 developers from the onsite team and the offsite team includes 7 team members. The project has a single code base which is at Element logic site and all team members download code and commit their work to a single location. The whole team has testers from both sides.

Problem Statement

Domain related challenges

The Element logic Warehouse Management System (EWMS in short) caters requirements to store various types of products varying from small items like jewelleries to car parts and mobile phones. EWMS competitive advantage was its efficient way of handling the warehouse operations and the different types of automated equipments the system supports. In order to achieve this, the system has many complex logics inbuilt. From Exile, our team was new to this domain and this complexity gave us additional challenge in understanding the system. To add to this difficulty we were facing, there were very limited people from Element logic who were domain experts who can clarify our doubts.

Technical challenges

The Element logic code base consists of more than 120 projects in the solution base. The code was not written following the object oriented principles and no proper coding standards or naming conventions were followed. Further the database was not normalized. For a new team from Exile this made it difficult to understand and get familiar with the code base.

Operational challenges

Element logic did not have a documentation that they can provide us to go through and get the knowledge about the application. It was absolutely impossible for us to study the whole system at once and propose a fixed estimate for the project.

Further though there were new customers with new features for the new application we are going to develop, there were existing customers and it was important for us to make sure that the new changes we implement should not affect the existing customers. To develop the new fully pledged application and do a complete migration from legacy to new was out of the question as the "time to market" factor played a vital role when it comes to the new customers

Even if Exilesoft spends massive effort in documenting the requirements as we get some understanding about the system, Element logic was not in a position to allocate a resource to read the lengthy conventional documents we to validate the understanding.

To start the project since we had a level of unknowns we had to move away from the traditional approaches. Exilesoft has selected agile methods for engineering software projects and has been successful. However Element logic didn't have the exposure of using agile practices. This created another challenge.

Proposed solutions

Domain related solutions

The Product owner was appointed from customer side who had a clear vision for the product and a good knowledge about the new features.

During our Sprint zero, Exilesoft visited the customer for duration of 6 weeks. There two important tasks we did in our 0th Sprint. One was the workshop conducted by the Product owner, to set a fresh warehouse with the offshore team members; similar to the activities they would do when they do a new installation at a customer site. This gave the new members a hands on experience of using the system as a warehouse user would do and also how each part of the warehouse is configured and linked together. The second thing is to visit a real warehouse to see the operation through their eyes, and to get a better understanding about how these automated equipment work and what is our role in getting them to be used in an efficient manner optimizing the warehouse operations.

Due to the complexity of the domain we decided to concentrate on specific key areas where new featured were requested by customers.

Technical solutions

The development team from Element logic was to be expanded with the offshore team members. Having team member from Element logic helped the team to resolve issues related to the legacy application.

Further we decided to use the tools already used by Element logic and set up the environment with SVN, Jira, Confluence and Teamcity hosted in Element logic server. Practicing TDD and at least for the identified critical part of the application having the code coverage around 80 percentage was considered needed as development carried out from both ends needs to work without crashing the existing functionality.

"Enough design upfront" was adopted for the new development with the common understanding from both sides that the design will be revisited and it will evolve as we progress with the new implementation.

Operational solutions

1. Project initiation

Using traditional approach for this project seemed dreadful due to the facts such as documenting the requirement was not practical and there is no one to verify the understanding the offshore team has gathered. Since there were so many unclear areas involved, both partners agreed that the best fitting model will be something adaptive by nature and transparent. Since it was impossible to clearly define the scope and extent of our work, we decided to go for a contract based on monthly billing for the allocated resources which proved to be and cost effective for both parties.

Exilesoft proposed Agile approach for this project. Exilesoft conducted a workshop as the initial steps to get Element logic understand Agile values and also to see how Agile will fit in such a context. Element logic agreed that this will be much better and result oriented than going for a fixed budget and hoping offshore team to will handle all the problems on their own. A workshop was carried out at the initiation process to see how Agile will fit-in in such context. Exilesoft's Chief project officer conducted agile orientation for this and also decided to use the monthly billing contract type.

The scrum master was also from the customer side and this helped us to get impediment resolved quickly especially when things had to be done from Element logic side and timely access to the main stakeholders of the project.

2. Sprint Planning

Our sprint planning meetings were handled a bit differently as we need to concentrate on multiple customer requirements at the same time which will get released with very short intervals. We do split within the resources where each part of the team can concentrate on the requirements for one specific customer. However when they don't have new tasks from the customer they are working on, they will switch

to the other customer's requirements and pick ToDo tasks to work on. And the limited access we had to the Product owner made us come up with the Sprint pre-planning sessions.

3. Sprint execution

We have the daily scrum together with all the team members from both sides and the scrum master using video calls. The meetings are aided with 360 view Polycom camera device and 42" screen, which gives each side to view the entire room of the other participants. This increased the feeling of presence although we were in different continents. To make the participant be punctual for the daily scrum, the meeting room will be locked as soon as the meeting begins and anyone late will be left out from the meeting.

Apart from daily scrum we do have many ad-hoc discussions whenever we see that it is necessary. This could be discussion within 2 developer on tasks they are working on which has dependencies or with a small group of the team members with product owner or the customer support team from Element logic.

The teams co-locate very frequently and this could be with a release in Norway or to plan the new features for the coming up release. The offshore team members who have been working more on the tasks related to the release visit onsite during the release period, and the visit is sponsored by Element logic. The Product owner or Scrum mater will visit the offshore team when we are planning for new features for the coming up release, and this is sponsored by us.

Whenever we have new members in the team we plan for an onsite visit accompanied by one of the senior member from the offshore team so that the new comers can get the same exposure by visiting one of the warehouses.

During the customer visits to Sri Lanka, we invite them for company parties, team outings and team building activities. When we were on our onsite visit, our Product owner invited us for dinner at his place and our team joined him to prepare the meal. These times we spend together outside project work, helped us foster team bonding which is essential for Agile teams. As executing this plan we found this to be an efficient and pleasant way to settle multicultural issues in such distributed team context which is common in software outsourcing.

Using confluence was quite effective as we had substitute for whiteboard discussion up to a satisfactory level. We use plugins to create mock-up and also flow diagrams and share it within the onsite and offshore team members.

At the starting of the project the domain related sprint tasks were handled by the onsite team members and the UI related tasks were given to the offshore team since their domain knowledge was not sound. As we went on, the offshore team members got familiar with the domain and they were able to handle the core domain related tasks as well.

In our team currently we have one tester. Having one person to perform some manual testing for the whole system when we get near to the release is not sufficient. Being a cross functional team, once we come to

a state where most of the functionalities are tested and bugs are fixed; to do a regression testing we get the entire team to perform the manual testing and report the bugs they come across. Once this is done we get back to fixing and this will be verified by the tester or someone from the customer support team from Element logic.

4. Retrospectives

One of the areas we improved based on the discussions we had during the retro is that sometimes when we do get near to a release and we come across some critical problem which needs to be fixed, due to the urgent situation we had to give quick fixes, though we know that this is not the proper way of handling the problem. We identified this as not a good way of going forward when we look at the product maintainability. Therefore we agreed that whenever we come across these quick fixes we will add a separate task into 'Technical debt' so that once the current release is over we revisit the problem and give a proper solution.

Since the Product owner was frequently unavailable for the sprint planning meetings and clarifications required, two measures were taken which proved to be very useful. One is, we introduced the Sprint pre-planning meetings. We conduct short pre-planning sessions a couple of times during the current sprint to plan for the next one with the product owner and the some members from the team. And one such member will act as the proxy-product owner during the coming up Sprint planning meeting.

The other is, Element logic trained their support team members to be domain experts on specific modules. This reduced the bottleneck.

Summary

Learning points

In a project in which we cannot come up with a fixed estimation, to go for a contract with monthly pricing model, which will be beneficial for both parties.

When we have alien domain and legacy application with difficult to understand code base having a transparent model which will allow the process to evolve will be the best option than traditional approaches.

To build trust and team bonding between the onsite and offshore team, the continuous collaboration plays a vital role.

Snapshots of progress

After signing up with the offshore partners Element logic has been able to win-over many new customers with the improved versions of EWMS. One of the Element logic's main customer due to the satisfaction

they have got with the improved version has extended an invitation to bring prospective customers to their warehouse to demonstrate their product is running smoothly.

New component called the 'Warehouse by voice' has been added to EWMS which allows the user to operate using voice controls in the warehouse which was not a part of the legacy application.

Initially the offshore team was developing the UI related tasks while the onsite team handled the core business related functionalities. Now the offshore team is involved in developing the core domain related functionalities after earning the confidence.

Automation

Continuous integration: the tests created as unit tests, integration tests, and specflow tests run in the build server for each commit the developer does to make sure the existing functionalities are not broken.

When the total test cases we have in the system reached over 2000 the whole team celebrated this achievement about a year ago.

Automated UI tests updates the test cases created and marks the failed tests as well as the one which are not automated to make it visible that those should be run manually.