

Implementation of an Agile-ISO 29110 Software Process in a Large Canadian Financial Institution

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Mini Case Study

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The 40 employees of the Treasury Solutions Department (TSD) is responsible for the development and maintenance of software applications used by 80 traders of a major Canadian financial institution. Each year, the department observes a significant increase in its backlog to add, correct or modify features related to supported applications. The Management and Engineering Guide of the Basic profile of ISO/IEC 29110 was implemented, by a team of 6 developers, in an agile approach with SCRUM. The new agile process has been tested on three pilot projects. The implementation of the new process ISO/IEC 29110-agile process has resulted in significant reduction in the number and the impact of incidents. Three pilot projects allowed us to experiment with the new agile process using the Basic profile. The improvements made and the integration of the SCRUM method have helped to significantly reduce the number and impact of incidents caused by changes in production. The traders are very satisfied with the new agile ISO/IEC 29110 process, traders better manage their priorities of their requests for new functionalities and they know more about the progress of their requests.

The VSE and its Environment

The Canadian banking institution has an IT division of 3,600 employees. Over 1,200 applications are supported by the IT division. One of its department, the Treasury Solutions Department (TSD) of 40 responsible employees, is for the development and maintenance of about 10 applications used by 80 traders in their daily activities. The budget of this department is about 1.5M\$ CAD.

A reorganization in 2011 has led to the centralization of all IT support activities and the deployment of one IT process. The process was very efficient in supporting most activities of the network services centers of the large financial institution. The process of the IT division was too rigid for the rapidly increasing requests of traders.

The TSD department conducted 3 pilot projects using a SCRUM approach in 2014. About 23% of the TSD budget is invested in the maintenance of applications. A mandate was issued to the manager of a team of 6 employees (i.e. a Very Small Entity, VSE), that is responsible to provide 12 software tools to traders, to assess the feasibility of conducting all new projects using the new agile approach.

<u>Starting Point</u>

Before the implementation of the new ISO/IEC 29110-agile process, traders had the following complaints:

- Very difficult to know the status of specific requests
- Very often, there is an incident when a change is put in production.
- There is a large number of faults detected by the quality assurance department
- The development process is painful and the documentation produced is not very useful.

In response to the problems listed above, the development process was evaluated by comparing the activities of the actual development process with those of the Basic profile of ISO/IEC 29110.

The Improvement Project

The business objectives of the TSD was to reduce the number of major incidents related when changes were put in production while improving the productivity of its development teams and the quality of the artifacts produced.

A mandate was issued to the manager of a team of 6 employees (i.e. a Very Small Entity, VSE), that is responsible to provide 12 software tools to traders, to assess the feasibility of conducting all new projects using the new agile approach. The improvement project, of the 6-person VSE, was divided into 4 phases:

1. Analysis of the ability of developers to adopt agility

The objective of this phase was to evaluate the development process used at the TSD and to draw up a list of recommendations based on the management and engineering guide of the ISO/IEC 29110 Basic profile.

To present an accurate picture of the situation, two types of projects carried out at

TSD software the were assessed. development projects with or without the presence of a project office and software maintenance projects. The PM process of typical software development projects, besides a few minor deficiencies, was covering the tasks of the Basic profile. Some shortcomings were found in the project management process and in the software implementation process of maintenance projects. Figure 1 illustrates the coverage of the project management tasks of the maintenance process to the Basic profile before at the beginning of the improvement project.

As illustrated in figure 1, the coverage of the PM activities by the maintenance process, beside the project plan execution activity, was quite low. As an example, only 44% of the project planning tasks were performed by the process in place at the beginning of the improvement project. One deficiency noted was about risks: risks were documented at the beginning of a project but the risks were not updated during a project.



Figure 1. Coverage of the project management tasks to the Basic profile (Laporte et al. 2016)

Figure 2 illustrates the coverage of the software implementation tasks to the Basic profile at the beginning of the improvement project.



Figure 2. Coverage of the initial software implementation tasks to the Basic profile (Laporte et al. 2016)

As illustrated in figure 2, the coverage of the software implementation activities of the maintenance process was better than the PM activities illustrated in figure 1.

2. Initiating and executing a pilot project

The objective of this phase was to experiment with the SCRUM approach as part of a TSD maintenance project. A training of 15 hours was provided to all participants.

3. Experimenting and improving the process The objective of this phase was to apply the SCRUM approach software in а maintenance context and to integrate activities that complementary would improve the overall productivity of the team and thus build a deployment package, based on the experimentation of the new process.

4. Final Documentation

The objective of this phase was to document the "ISO 29110-Scrum/TSD" deployment package as well as the logbook describing the steps leading to the final product. Representatives of the Project Office and the Audit Group required just a few minor modifications to the ISO 29110-agile process.



Figure 3. Monthly number of incidents and their impact (Laporte et al. 2016)

<u>Results</u>

In this organisation, an incident is classified as minor or major using a set of criteria such as the number of impacted systems, the severity, number of customers impacted and criticality of the impact. The criticality is evaluated on a 1 to 5 scale. Figure 3 illustrates the decrease in the numbers of systems impacted as well as in the total criticality level. In June 2014, figure 3 illustrates that 5 systems were impacted and the criticality of those 5 incidents was of 17. About 9 months later (i.e. March 2015), both the number of incidents and the criticality were very low (i.e. one incident and criticality of 1).

A survey has been conducted to measure the satisfaction level of traders after the deployment of the new process. The following questions were asked to traders (on a 0 to 10 scale):

- 1. How do you qualify the quality of our software upgrades (e.g. number of incidents recorded in production)?
- 2. Are you well informed about the content of the next software upgrade?
- 3. Is the frequency of delivery right for you?
- 4. How do you trust the new process?
- 5. How would you describe the ability of the new process to respond to your needs?

- 6. How easy is it to consult the status of a change request?
- 7. How much the new process prioritizes the added value for you as a trader?
- 8. What is the quality level of upgrades?
- 9. Are you satisfied with the productivity of the team in response to your needs?
- 10. What is your overall level of satisfaction about the new process (e.g. quality, cost, return on investment)?

Figure 4 illustrates the increase in satisfaction level between the old process in 2014 and the new ISO 29110-agile process in 2015.

The maintenance team was also very pleased to see an improvement in the quality of the change requests, resulting in a noticeable decrease in the number of defects when handed to traders.



Figure 4. Satisfaction levels of traders (0 to 10 scale) before and after the implementation of the ISO 29110-agile process (Laporte et al. 2016)

Lessons Learned

The adoption of this agile approach, required a higher availability from the users. Initially, this new approach presented a challenge. In some cases, a few users appointed a representative to play the role of head of product backlog. But that person did not have adequate knowledge of the business domain. Also, the head of product backlog was not able to respond quickly to questions from developers about the requirements, and user stories were not sufficiently documented in advance to maintain the velocity of the team.

The maturity of the development process used to perform the iterations is quite important. The implementation of ISO 29110 was very useful during this transition to agility. Since the software development activities and tasks of ISO 29110 are independent of the lifecycle used, it was possible to improve the development process and then integrate practices of the SCRUM approach.

Finally, it is essential to adapt the SCRUM approach to the context and constraints of the organization. All adaptations to SCRUM have been documented in the new ISO 29110 - SCRUM process of the financial institution.

<u>Plans for the Future</u>

The ISO 29110 agile process will be used to carry out all maintenance projects of the TSD department. A single product log will be used to prioritize requests (including production problems). This process improvement initiative allowed the VSE, of a large Canadian financial institution, to respond to issues that are a priority for all teams of the Treasury Solutions Department.

In 2017, management adjusted the development process to handle operational demands, incidents, and production issues separately from evolution requests, using the Kanban method. Since it was difficult to assess the effort required to achieve these types of requests and, the prioritization of the product book was reviewed daily with production events, it became difficult for

this team to commit to the scope of the project. an iteration of development. The SCRUM approach is suitable for the development of evolution requests. But, it is not as well suited in a very dynamic context such as software maintenance.

Support team with Kanban and the evolution team with Scrum perform their daily meeting jointly, which greatly encourages communication between the two teams, promotes deployment planning and the management of development branches. The client also participates in the daily scrum and gets a portrait of the progress of the two teams at the same time. He can review the priority of the incidents in the Kanban board. But, the client cannot change the scope agreed with the evolution team. If the support team is overwhelmed by urgent incidents, a member of the evolution team is immediately assigned to ensure the ongoing operations.

Through the use of these agile Kanban and Scrum methods, both based on the elements ISO/IEC 29110, the DST of team maintained in 2017 an application availability level of over 99.88%, even though the target initial availability was 98.5%. In 2018, the availability target has been increased to 99%.

In 2018, the Treasury Solutions Division is putting a lot of emphasis on testing automation by targeting a "DevOps" culture. This will increase the productivity of the maintenance teams, accelerate the delivery of value for the customer while maintaining product quality and compliance with application availability rates for their 80 customers.

References

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More	information	is	available	on	the	following	web	sites:
http://profs.logti.etsmtl.ca/claporte/VSE/index.html								