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15356 – Reflective Project Practice
Individual Assignment

Learning Through Reflection while implementing an Agile Software Development Methodology at a Major Telecommunications Company

Report to Mrs Chivonne Algeo

Beatrice Ngo – 10728273
UTS: Design, Architecture and Building
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Abstract

Key words: ‘Reflection’, ‘Learning’, ‘Agile’, ‘Methodology’ and ‘Telecommunications’.

This reflective report explores the topics of ‘reflection’ and ‘learning through reflection’ within the context of the project environment within one of Australia’s major telecommunications companies (hereby referred to as ‘The Company’).

The project was to develop and deploy a comprehensive new software development methodology within The Company; a methodology based on the Information Technology paradigm of ‘Agile Software Development’.

Implementing Agile methodology within The Company involved:

- Industry and vendor engagement to develop a comprehensive ‘best practice’ Agile methodology and framework which also met the specific needs of The Company.
- Training for staff within the large Information Technology department of The Company.
- The implementation of new metrics and measures to reflect on, and validate the success of, the new methodology.

The Agile methodology implemented within The Company incorporates a significant amount of reflective practice in the form of ‘retrospectives’. A retrospective is “a meeting held by the project team at the end of a project or process to discuss what was successful about the project or time period covered by that retrospective, what could be improved, and how to incorporate the successes and improvements in future iterations or projects”. The retrospective process:

- Is an example of Social Learning.
- Is an example of Experiential Learning.
- Is *not* an example of Problem-Based Learning.

The Company achieved several benefits through the use of reflective practice in the form of these retrospectives – such as:

- Increased trust within the project team.
- More effective reflection on work performance.
- More effective project debriefings.

Through reflection over time, The Company learnt various lessons in terms of ‘common ailments’ regarding their Agile projects, and suitable cures for each issue.

‘Learning through reflection’ could have improved the outcome of this project in various ways, such as:

- Allowing the project team to achieve ‘double-loop learning’.
- Allowing team members to learn from their failures.
- Slowing the pace of learning, allowing proper comprehension.
- Allowing ‘deep’ learning to take place.

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1. Introduction

'Reflection' is a form of mental processing based on the "further processing of knowledge and understanding that we already possess" (Moon 2004, p. 82); while 'reflective practice' "emphasizes the use of reflection in professional or other complex activities as a means of coping with situations that are ill-structured and/or unpredictable" (Moon 2004, p. 80). Reflection is a crucial learning tool for both individuals and organisations, and yet it is an area which gains little formal focus within many organisations (Argyris 1992, p.84).

This reflective report explores the topics of 'reflection' and 'learning through reflection' within the context of the project environment within one of Australia's major telecommunications companies. This report will be published in a publically-accessible project management journal, and so the company name cannot be used – instead, it will be referred to as 'The Company' throughout the report. This limitation has also prevented the inclusion of company-specific references which would identify the organisation.

The report first presents a description of a focus project – a major project within The Company which incorporated reflective practice; but which could have implemented reflective practice more effectively. The report then outlines the approach and methodology taken for this project (with a particular focus on the methodology regarding reflective practice). The report then explores the 'lessons learnt through reflective practice' for this project and organisation, and then finally, explores how 'learning through reflection' could have improved the outcome of this project – and indeed other major projects undertaken by The Company as well.

2. Project Description

The project was to develop and deploy a comprehensive new software development methodology within The Company; a methodology based on the Information Technology paradigm of 'Agile Software Development' (hereby referred to as just 'Agile' methodology). Agile is a way of working – values, principles and practices – based on "iterative and incremental delivery, where requirements and solutions evolve through collaboration, between self-organising, cross-functional teams, to deliver solutions that provide value to customers and stakeholders as early as possible".

Agile is differentiated from the older, more established Information Technology paradigm of 'Waterfall Software Development' which was previously well-entrenched within The Company. As a major telecommunications company with a large Information Technology department, effective software development is of major importance and economic significance to this organisation, and so this was a high-profile project.

A brief comparison of Waterfall and Agile methodologies, as utilised by The Company:

Waterfall	Agile
Define, and 'sign off', all requirements for the whole project before project implementation is commenced	Define the requirements for only one 'phase' or 'iteration' of the project at once – always planning just one iteration ahead
Implement the whole project using a single 'big bang' approach	Implement the project as a series of short (generally two week) iterations, developing and deploying small components over time in an iterative manner
Plan and execute the project using isolated teams of professionals with traditional roles – project manager, business analyst, developers, testers and so forth	Still utilise the same professionals, but using a more collaborative approach – plan the project using workshops including all participants, build and test the project components using 'pair programming', and so forth
Do not deploy anything into the live ('Production') environment until every component of the project passes operational acceptance	Deploy components iteratively as they are ready, allowing stakeholders to receive smaller benefits more often in an iterative manner. This does not introduce more risk, as the components were developed with closer stakeholder involvement, and so are more likely to meet their requirements

3. Project Approach and Methodology

This section outlines the approach and methodology taken for this project – with a particular focus on the methodology regarding reflective practice.

Implementing Agile methodology within The Company was a major endeavour, involving:

- Significant industry and vendor engagement to develop a comprehensive 'best practice' Agile methodology and framework which also met the specific needs of The Company.
- Training for staff within the large Information Technology department of The Company.
- The implementation of new metrics and measures to reflect on, and validate the success of, the new methodology.

In order to develop an appropriate Agile methodology for The Company, the project team first looked to the 'Agile Manifesto' – an 'open source' standard for Agile development widely recognised as 'best practice' within the Information Technology industry. The Company then engaged a major industry partner to provide 'Agile Consultants', to come in-house to evaluate existing software development practices (as well as the operating environment and organisational structure) within The Company and customise an Agile methodology for The Company accordingly.

A major element of the project implementation was for staff to be trained in the new methodology. For this purpose, the project team developed and deployed a comprehensive set of both 'instructor lead' and 'e-learning' training courses and materials. This training was very much 'work embedded', being closely tied-in with the rollout of new projects and adopting a 'just in time' and interactive approach (for example 'Agile Coaches' were embedded day-to-day within project teams using the Agile methodology, to help drive and refine its use). This training strategy reflects the views put forth in Wankel and DeFillippi (2005) that "there is no better vehicle for profound learning than the work itself" (Wankel and DeFillippi 2005, p. 271), and that "an adult learns best via hands-on problem solving" (Wankel and DeFillippi 2005, p. 271).

Lewis (2007, p. 272) states that project reflection should measure (among other more qualitative measures) the following project metrics: rework, speed, quality, number of scope changes and customer satisfaction. The project team at The Company put measures in place for all of these metrics within its Agile methodology. The project team also implemented what Lewis (2007, p. 343) refers to as 'status', 'design' and 'process' reviews:

- Status reviews – look at the status of cost, performance, schedule and scope.
- Design reviews – examine a product or service to see if it meets requirements.
- Process reviews – examine project processes and ask if they can be improved.

In regards to reflective practice, the Agile methodology implemented within The Company also incorporates the concept of 'retrospectives'. Retrospectives are a period of time specifically put aside (within each project iteration) to reflect on how the team is performing and what can be done to improve. These retrospectives are implemented as workshops which include all major project stakeholders, and they play a crucial role within the methodology. These retrospectives are examined in detail within the next section of this report, 'Lessons Learnt through Reflective Practice'.

4. Lessons Learnt through Reflective Practice

This section explores the 'lessons learnt through reflective practice' for this project within The Company. In doing so, this section:

- Discusses specific reflective tools and techniques utilised by the project team.
- Demonstrates a focus on the reflective aspect of how the project was managed.
- Relates the topic of 'learning through reflection' to the experience of the project team in implementing (and reflecting on) this project. This includes a discussion of elements such as learning styles, social learning, experiential learning, and so forth.

As discussed in the previous section, the Agile methodology implemented within The Company incorporates a significant amount of reflective practice in the form of 'retrospectives'. A retrospective is "a meeting held by the project team at the end of a project or process (often after a certain number of iterations) to discuss what was successful about the project or time period covered by that retrospective, what could be improved, and how to incorporate the successes and improvements in future iterations or projects".

The purpose of the Iteration Retrospective is "for the team to review what worked, what did not work, what they have questions about and what actions they will take for the next iteration". It is not about presenting the outcomes of the iteration to stakeholders or customers; this is covered in the 'showcase' phase of the methodology.

An 'Iteration Manager' (a project manager for the project iteration) is responsible for coordinating and conducting the iteration retrospective meeting:

- All team members attend.
- Others from outside the team can be invited, but only if their presence assists the team in reviewing the processes used in the iteration.
- If the presence of non-team members means the team is not comfortable in discussing operating practices, then non-team members should not attend.

Specific techniques to be followed in the retrospective meetings:

- Each team member puts up their ideas – suggest three ideas each.
- Common ideas are grouped.
- Team members vote individually for the most important things in each category.
- Discuss each category – focus on the high priority items.
- Agree actions for the next iteration.

The retrospective process is an example of Social Learning:

- Concrete Experience (doing / having an experience).
- Reflective Observation (reviewing / reflecting on the experience).
- Abstract Conceptualisation (concluding / learning from the experience).
- Active Experimentation (planning / trying out what you have learned) (Leigh 2012).

The retrospective process is also an example of Experiential Learning, which Moon (2004, p. 109) defines as "a process in which an experience is reflected upon and then translated into concepts which in turn become guidelines for new experiences".

The retrospective process is *not* an example of Problem-Based Learning, as 'unstructured problems' are *not* used as the "starting point and anchor for the learning process" (Wankel and DeFillippi 2005, p. 292); instead, the learning process in this case is based around

continuous improvement through reflecting on project performance at the end of each project iteration.

The Company achieved several benefits through the use of reflective practice in the form of these retrospectives – such as:

- These group retrospectives build trust within the project team – and as Cooper 1975, p. 157) states, a high-trust environment leads to: low defensiveness, high self-confidence, high feelings of competence, efficacy and positive learning outcomes.
- As Argyris (1992, p. 87) states, "it is difficult for people to reflect critically on their own work performance, especially in the presence of their manager". These retrospectives are highly-structured though and they are tightly integrated with the rest of the project process, making them easier for team members to engage with.
- When the project team discusses their conclusions, their questions, the processes they have adopted and their project strategies (as occurs in these retrospectives), "the whole group begins to learn together from the variety and the commonality of their experiences" (Wankel and DeFillippi (2005, p. 20-21).
- The retrospective for each project iteration forms a 'debriefing', and as Wankel and DeFillippi (2005, pp. 20-21) states "debriefings provide a means to crystallize some of the overarching concepts that are emerging in the experience" (Wankel and DeFillippi 2005, pp. 20-21).

As more projects were implemented using the Agile methodology, The Company reached several 'lessons learnt' through its reflective practice in the form of these project retrospectives:

- It is best to split into small groups to narrow down actions (this helps with large teams or with quiet members).
- Use a meeting space without a table.
- Have a backlog of retrospective actions with done / not done next to them.
- Write the output on a flip chart and stick it up in the workspace where all can see.
- Location is important – find a good spaces and 'mix it up' so as not to always be in the same place.
- Write up the retrospective output including actions and put on a blog/wiki or send round in an email.
- Do a 'warm up' exercise to break down any tension and get people in the mood.
- Providing some food is an excellent way to make the session more appealing, and is a great leveller.
- Use a facilitator from outside the team.
- Swap the facilitation role within the team: don't let it fall to the same person each time.
- Plan the retrospectives carefully – don't just turn up and run it the same way each time.
- Throw away everything from the retrospective *except* the retrospective actions. Focus on outcomes, not problems.

Through reflection over time, The Company learnt various lessons in terms of 'common ailments' regarding their Agile projects, and suitable cures for each issue:

Ailment	Cures
Actions not captured/ No obvious record or review of previous retrospective findings	• Review the actions from the previous retrospectives at the beginning of each retrospective. • Capture/Document actions & follow up by Scrum Master • Maintain backlog • Focus on last sprint only • Make someone responsible and accountable for each action. • Put the actions somewhere visible in the team space for example to create team building spirit • Reduce actions to a manageable number
Too many actions	• Apply velocity to actions, track progress and only take on what velocity dictates • Try Plan Of Action Retrospective Plan • Only choose one action
Unjustified actions	• Use root cause analysis • Ensure actions are suggestions from the team and prioritised by them.
Not having the right people in the retrospective	• Invite people early • Pick a time that suits everyone • Have separate retrospectives for tech team & wider team
Biased chair / Agenda hijacking	• Feedback to chair and escalate if necessary • Rotate chair • Coach chair on 'Agile' principles • Let team choose a non-biased chair
Lack of preparation/ Forgetting what's happened	• Compensate in the meeting by having a good time line • Prepare - personal/team log • Remind participants to think of good and bad points • Reminder before the meeting
People not speaking up/shy	• Chair/facilitator needs to create the right environment • Suggestion box/amnesty • Try different games which are more suited to retiring types
Retrospective actions and tips not shared with other teams	• Rotating facilitators • Shared retrospective blog • Retrospective 'lurking' • Cross team collaboration needed
Voting system may result in valid issues not being addressed	• Non-addressed issues get rolled over • Themed retrospectives • Encourage team to get on well so they empathise more with issues affecting minority • Vary the retro format (eg. no voting)
Suffering from 'Group Think'	• Have a Devil's Advocate • Try using the tool 'De Bono's Six Hats Thinking'

5. How Learning Through Reflection could have Improved the Outcome

This section explores how 'learning through reflection' could have improved the outcome of this project – and indeed other major projects undertaken by The Company as well. This involves an analysis not only of the benefits of reflective practice within projects in general, but an analysis of how reflective practice – and by extension, learning through reflection – could have brought benefits to this project implemented by The Company.

The following outcomes can result from 'learning through reflection' and reflective processes in general:

- Learning, knowledge and understanding.
- More effective forms of action.
- A process of critical review.
- Personal and continuing professional development.
- Reflection on the process of learning or personal functioning.
- The building of theory from observations.
- The making of decisions/resolutions of uncertainty, the solving of problems, and empowerment.
- Greater emotional engagement.
- Clarification and the recognition that there is a need for further reflection (Moon 2004, p. 84).

'Learning through reflection' could have improved the outcome of this project in various ways. The first and probably most significant way is that it could have allowed the project team to engage in more effective 'double-loop learning'. As Argyris (1992, p. 8) states, 'single-loop learning' involves a cycle of "actions, consequences and mismatches/matches" – while 'double-loop learning' allows the process to loop all the way back to the "governing variables"; in short, allowing the 'learner' (the project team in this case) to improve not only *the way they work on projects*, but also to improve *the way they learn about the way they work on projects*. This means that over subsequent projects, the project team could improve the project *methodology* itself.

To support 'learning through reflection', leading to 'double-loop learning' and the promotion of a 'continuous improvement' approach, The Company should have implemented the following measures when it deployed this project:

- More focus on flexibility and adaptability – the methodology is currently very comprehensive, but quite rigid and it is difficult to adapt on a 'project by project' basis when required. This is counterintuitive and also contradicts the 'agile' ideals the framework itself is supposed to espouse.
- An ongoing 'change management' process for the company's Agile methodology – to capture and record proposed changes to the methodology, track any changes which are made to the methodology, and to properly measure the effects of any changes made.
- What other companies have referred to as an 'Agile Community of Practice' – a knowledge-sharing framework to share experiences gained on Agile projects 'company wide', allowing project experiences to be shared *between* projects.

'Learning through reflection' improves project outcomes in a number of ways. Organisations need to reflect carefully on both project successes *and* failures, as "if you don't know how

you did something, you can't repeat it; and this happens all too often in organisations everywhere" (Lewis 2007, p. 352). One of the biggest barriers to effective project reflection though is the "aversion that people have to 'airing their dirty laundry'" (Lewis 2007, p. 353) – thus negative feedback is often not received, and so project teams are not able to learn from their mistakes. To assist with this, the project team which implemented the Agile methodology at The Company should have put more processes in place to ensure that 'independent facilitators' would be involved in the retrospectives held at the end of each project iteration. Independent facilitators could also be used for other sensitive issues such as conflict resolution.

In fact, even where the reflection process, by means of the project retrospectives, causes team members to see their own failures at times, this can be a positive experience. As Argyris (1992, p. 85) states "because many professionals are almost always successful at what they do, they rarely experience failure... and because they have rarely failed, they have never learned how to learn from failure". Retrospectives can allow the project team to learn from their failures in a 'safe' and constructive environment.

Some other ways learning through reflection could have improved the outcome of this project:

- Reflection slows the pace of learning, which allows learners to be more aware of and more able to reflect on, their own learning processes, their weaknesses and strengths (Moon 2004, p. 86).
- Reflection allows 'deep' learning to take place, where the learner "not only improves their behaviours, but also seeks the underpinning principles and endeavours to relate the material to previous knowledge and understandings" (Moon 2004, p. 59). This 'deep' learning approach "tends to produce higher quality learning in assessment tasks but enables the recall of content in a more effective manner after a period of time" (Moon 2004, p. 61).

As Wankel and DeFillippi (2005, p. 95) state "reflection is fundamental to learning and provides a basis for future action". By following the recommendations put forward in this section, The Company could have improved the outcomes of its project to implement Agile methodology within the organisation.

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