

Adapting agile workflows to accelerate geoscience study results

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SUMMARY

Woodside Exploration routinely conducts large regional study projects to inform business decisions regarding new acreage, data acquisition and drilling. Whilst varied, these studies generically comprise phases of data collection and conditioning, analysis, collaboration and actions leading to assurance and finally completion. These studies are usually managed in a linear, or Waterfall, approach and time taken to complete these phases ranges from weeks to months depending upon complexity. An 'Agile' approach, originally developed for rapid software development, has been modified to fit geoscience studies insofar as we define a 'Rapid Study Sprint' (RSS) that combines the analysis and collaboration phases of the project into a facilitated workshop, at the end of which preliminary products must be completed. The RSS is analogous to a hackathon and leverages intense collaboration to drive fit-for-purpose outcomes. Woodside Exploration Australia held its first RSS in 2017 to produce a play-based exploration evaluation of the Jurassic (J50) Macedon play interval in the Exmouth Sub-basin, offshore Western Australia. In one day of intense collaboration, the RSS generated maps of equivalent quality to traditional regional studies. This paper compares the actual time and cost of this RSS with a notional project plan for a conventional regional study with the same objectives and deliverables. Comparison demonstrates that the RSS and conventional regional project has a similar ultimate duration. However, the distribution of effort and reward varies considerably; with a 40% cost saving attributed to the reduction in worked hours and delivery of usable products two weeks earlier. Savings are attributed to the core principles of Agile driving collaborative behaviours and simplifying business processes to focus effort on the highest priority areas to address the key project objectives.

Key words: project management, agile, regional studies, play-based exploration

INTRODUCTION

Regional studies are projects conducted in geoscience to inform decisions regarding new acreage, data acquisition and drilling. These studies are usually managed using a linear or Waterfall process whereby discrete phases are sequentially executed (Knutson, 2011). The Waterfall project management style is common in industries like construction and manufacturing; and for many years it has also been widely used in software development. However, since the early 2000s, Waterfall

processes have been challenged and largely supplanted by Agile in software development. The change has been transformative for the software industry, and other industries have since adopted or adapted Agile methods (Serrador and Pinto, 2015).

The Agile Manifesto (2001) outlines the process' four core values:

1. Individuals and interaction are valued over process and tools,
2. Working models are valued over comprehensive documentation,
3. Customer collaboration is valued over contract negotiation,
4. Responding to change is valued over following a plan.

Woodside was an adopter of these principles, embedding them into the day-to-day work in the Science and Technology Divisions through Sprints, Hackathons and other activities geared toward rapid product development, testing and deployment¹. The approach led to significant acceleration of projects and associated cost savings for the Science and Technology Divisions. Yet, adoption of these activities and their ultimate utility within existing Exploration Geoscience workflows was less clear.

Woodside has been actively exploring for hydrocarbons in the Exmouth Sub-basin for more than twenty years. More recently, Woodside conducted a refresh of its play-based exploration processes to include Common Risk Segment (CRS) maps for all areas of interest for Exploration. Creation of these products may involve weeks or months of subsurface interpretation and analysis, usually organised under a Regional Study using a Waterfall process.

In 2017, Exploration Australia trialled a modified Agile approach to generate CRS maps for the Jurassic (J50) Macedon play in the Exmouth Sub-basin, North Carnarvon Basin, offshore Western Australia. The challenge was to produce high quality maps and analysis at a fraction of time and cost of a traditional regional study. This exercise was called the Rapid Study Sprint (RSS).

METHOD AND RESULTS

Rapid Study Sprint

A comprehensive framing session was held to assess the work required to complete the RSS. The framing highlighted the most impactful elements of the study requiring analysis. It was determined that substantial data collection and conditioning was required, but a useable product could be generated through

¹ See Trainer et al. (2016) and Cervone (2011) for more information on Agile activities

intense collaboration among the asset team and subject matter experts in a one-day facilitated workshop. The core values of Agile were embedded into the facilitated workshop, allowing for stakeholders to collaborate to produce preliminary products with less emphasis placed upon process, documentation and tools. Several issues arose that could not be addressed in the facilitated workshop, but these were not allowed to hinder participants producing at least preliminary products by the end of the one-day session. Rather, participants were encouraged to adapt processes, and if necessary adapt the agenda of the facilitated workshop to complete the preliminary products. The unresolved issues were addressed after the facilitated workshop and the preliminary products were further refined. The results were subsequently quality assured in the same manner as all play-based exploration studies.

Comparison with a Conventional Regional Study

The same data collection and conditioning would be required if a conventional regional study was conducted. The main difference is that each data would be analysed, interpreted, and possibly assured sequentially. The interpretations would then be amalgamated into CRS maps by the asset team and then separately networked with subject matter advisors. Following stage there would be revisions and updates ahead of quality assurance.

Advantages of the Rapid Study Sprint

The RSS combined the analysis and interpretation of the asset team and networking phases with the subject matter experts into a facilitated workshop. This equates to a large spike in personnel hours committed to the project in the facilitated workshop (Figure 1). However, over the whole RSS, the time taken to produce a useable product is reduced by two weeks compared to the conventional regional study. Despite the spike in personnel hours for the facilitated workshop, the RSS overall utilised 40% less personnel hours over the conventional regional study.

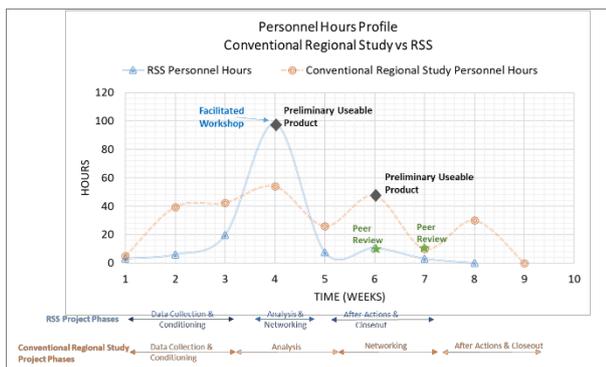


Figure 1. The J50 Macedon CRS RSS compared to a traditional regional study. The RSS combines the Analysis and Networking phases of a conventional regional study into a single facilitated workshop. In so doing, useable products are delivered two weeks earlier than the conventional regional study. Although the facilitated workshop creates a large spike in personnel hours, there is an overall 40% saving in time and cost over the conventional regional study.

CONCLUSIONS

Significant time and cost savings were realised by the adaptation of a conventional geoscience regional study using Agile principles. The compressed format focuses participants on the most impactful elements of the study; and the Agile principles of valuing the contribution of individuals and interactions, collaboration, iteration and reaction drives behaviours and processes that ultimately lead to high-quality and fit-for-purpose results.

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