Agile programming and its applicability to large, distributed international research projects and their management

Mike Kobernus, Alice Newton
Norwegian Institute for Air Research

Introduction

Scientists prioritize the allocation of project funds to research and related activities and welcome cost effective management mechanisms that clearly demonstrate savings in time, money and effort. Traditional waterfall approaches to project management have severe limitations and overheads that limit their applicability and usability in modern research projects. In this paper we discuss a practical approach to developing Agile e-Environmental tools with special focus on a case study for e-Environmental Services best practices.

About the Projects

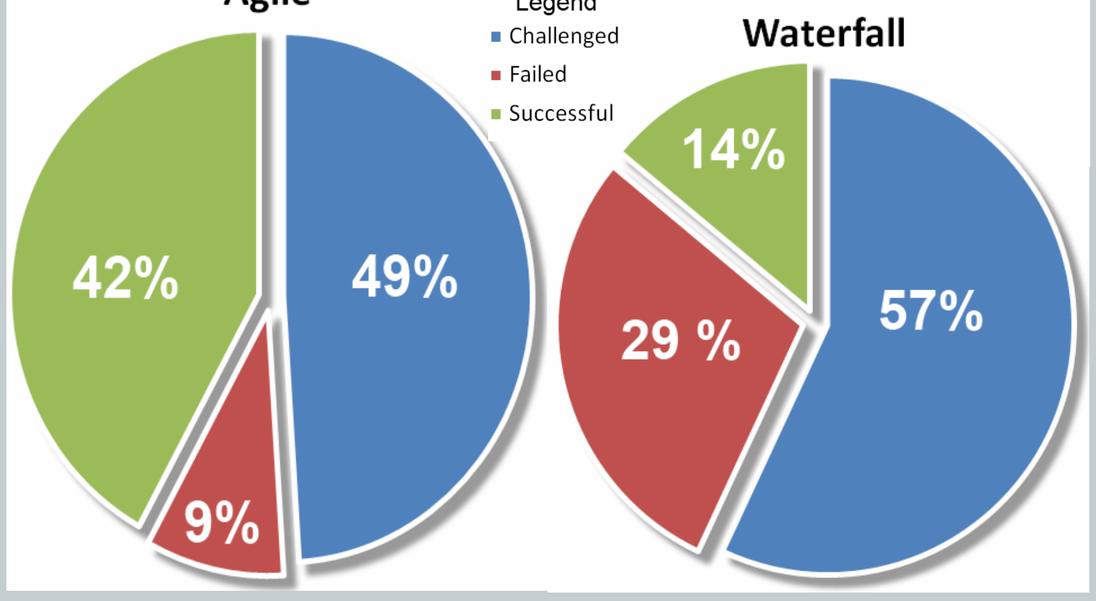
ENVIROFI will consolidate the Future Internet requirements from the *Environmental Usage Area* perspective and provide specifications and prototypes of interoperable geospatial *Environmental Enablers*. Agile methodologies were applied both for the management of the project and the development of downstream applications. These will be used in Terrestrial/Atmospheric /Marine environments.

COMET LA will identify sustainable community-based governance models for the management of natural resources that could be used in different social-ecological systems in a context of climate change and increasing competition for the use of these resources. The project will adopt the lessons learned from ENVIROFI and apply them to its own project management and development of services and tools.

Comparing Agile & Waterfall

Agile and waterfall methods are diametrically opposed approaches but have the same goals.

Agile approach	Waterfall approach
• Develop code fast • Quick, daily planning meetings • Individuals are self-organized • Working code early in the project	• Spend months in analysis and design • Long, weekly status meetings • Individuals are directed • Working code at the end of the project



Advantage of Agile over Waterfall

A recent study performed by the Standish group, reports that as many as 29% of waterfall projects fail, while only 9% of Agile projects fail. We believe that the success of Agile is largely due to the early involvement of end users and the early development of user accessible applications or prototypes.

Supporting the Agile Process

In addition, we developed or adopted specific tools that support the agile approach. These fall into two groups; centralized data storage with accessibility to the entire project consortium and tools used in software development and architecture design.

Wherever possible, we adopted free, or open source applications.

- ✓ Alfresco (online docs repository)
- ✓ DNN (public/private web portal)
- ✓ Media Wiki (specification dev)
- ✓ Use Case Server (use case dev)
- ✓ Confluence (content dev)
- ✓ Google Docs (content dev)
- ✓ Enterprise Architect (UML Modelling)
- ✓ NetBeans (Java)
- ✓ GIT (Version Control)
- ✓ SKYPE (Daily planning)

✓ *Open source, or license free software* ✓ *License donated*

Lessons learned

Due to the early involvement of our end users, we lowered costs by ensuring that prototypes were fit for purpose and matched user requirements exactly. We maintained regular contact both within and across work packages with regular planning sessions that kept us focused on priorities. We used effective tools to support the project that increased productivity by cutting out unnecessary emails and the typical document version control issues associated with sending content to multiple partners for review and approval. We created effective, independent teams that coordinated with each other without the need for management.

As consequence, the ENVIORFI project is on budget, hitting its milestones on time.

These lessons can be applied to any large, distributed project and COMET LA , which is comprised of 11 partners in countries as diverse as Norway and Colombia, will now take these lessons learned and attempt to use them over the next three years with the aim of reducing costs and raising quality as they identify sustainable community-based governance models for the management of natural resources.

References and acknowledgements

For more information on the projects mentioned here visit: www.envirofi.eu & http://cometla.nilu.no/

Agile Applications – A New Paradigm, an Old Devil, 2011, M. Kobernus, S. *Schade, D. Havlik, M. Egly, J. Pielorz*

Chaos Manifesto, 2012, Standish Group

Enterprise Architect from Sparx Systems www.sparxsystems.eu

Confluence from Atlassian http://www.atlassian.com/software/confluence

NILU PP 11/2012