

Risk Management for Agile Projects

Muhammad I. Shah*

Research Centre, Spring Bud Pty Ltd, Australia

***Corresponding author**
Muhammad I. Shah

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Abstract: Over the course of the last three decades agile project management has by far become the preferred approach to project management being employed by today's organisations. The online and fast paced nature of today's market place has meant that organisations need to be able to deliver their projects much quicker and in shorter time frames than in previous times. A new way of working has meant that existing areas of project management have needed to evolve to align with this new way of working. One such area is that of risk management. Risk management plays an integral role in the success both of a project and the organisation itself. This manuscript aims to review how risk management can be performed within an agile project management framework.

Keywords: Agile, Risk Management, Agile Manifesto, Projects, Project Management, Risk Register.

INTRODUCTION

Agile projects management has become the preferred approach to project management. The flexibility, simplicity and ability to get to market within smaller timeframes within deliverable components, has made it the preferred approach to project management. As highlighted in [1], Agile grew out of the real-life project experiences of leading software professionals who had experienced the challenges and limitations of traditional waterfall development methodologies on projects after projects.

The ability to manage projects successfully plays a critical part in the ability of a project to deliver a project to completion, successfully. The agile approach to project management was first introduced to the software community through the form of an agreed manifesto, commonly referred to as the Agile Manifesto. The Agile Manifesto initially started life out as a manifesto that highlighted the key values that agile software development should follow. However, it soon became so successive, that it has morphed into a grander approach, it is no longer applicable to software development projects alone. Instead it has grown and now forms the basis for project management across both software and non-software related projects alike.

The sweeping impact that the agile manifesto has had on organisations, is part of the reason why it has become such a successful approach to project management. Not all components of project management have been clearly defined and articulated within agile project management. Agile is a lean, iterative, change-driven approach to project management. The day to day operation of the project and the project team is relatively clear to all that employ this approach to project management. This, however, is not the case for all aspects of agile project management. Risk management is one such aspect. Risk management

is a vital component of project management. Within an agile approach to project management, this is also the case. The ability for a project to manage risk that is identified during the project, is a critical part of not only the success of the project, but also the success of the organisation. As highlighted in [2], an organisation's ability to manage risk is at the heart of their very existence. It is important to understand how risk management can best be supported within agile projects, to align with the core principles and values that have been defined in the Agile Manifesto. This will ensure that the approach taken to agile risk management aligns to the objectives of agile projects and therefore aligns with what has made agile such a successful approach to project management. As described in [2] Agile is iterative, and as such, risk management should follow this theme, and become prominent and form part of each iteration, as each identified risk is prioritised to be managed through to a control and monitor stage.

The remainder of this article goes as follows. The first section will introduce the Agile Manifesto. The second section will review the agile project management framework. The third section will review the importance of understanding risk and the management of risks. The fourth section will review how risk management can be supported in the change

driven agile approach to project management. The final section will draw the conclusion.

AGILE MANIFESTO

The Agile Manifesto forms the foundation upon which Agile has taken off, and become, by far, the preferred approach to project management in the last decade. The agile manifesto was formulated over a weekend that gathered some of the leading representatives of approaches that challenged the traditional sequential, documentation heavy approaches to software development. These leading representatives formed, what has since been referred to as the 'Agile Alliance' [3]. The Agile Alliance all shared a common view that software could be delivered quicker and easier, if delivered without the weight of the sequential documentation heaviness of the existing approaches to software development. Flexibility, the ability to embrace and not reject change and be able to deliver in smaller, manageable chunks was at the heart of their discussions. This resulting in the development of the Agile Manifesto, a Manifesto for Agile Software Development.

The Manifesto for Agile Software Development includes four key values:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

This Agile Manifesto is also underpinned by twelve Principles of Agile Manifesto. These principles form the basis and foundation by which all agile projects adhered to. The interesting point about this Manifesto is that was initially developed as a Manifesto for Agile Software Development. The success of the Manifesto was so profound that it has fast been embraced by software and non-software projects alike. The Manifesto for Agile Software Development quickly became simply the Agile Manifesto a Manifesto for all agile projects to follow alike. Let us now review the agile project management framework.

AGILE PROJECT MANAGEMENT

Agile project management is focused on a lean, rapid, collaborative approach to project delivery. Short, manageable yet sizeable chunks of deliverables are worked on during short, time-boxed iterations. This allows projects to deliver quicker, more efficiently, and with less overhead that the traditional waterfall approach to project management could support. As detailed in [4], the agile way of working, has provided an avenue in which organisations have been able to streamline their project delivery, allowing companies to get to market quicker and with greater efficiency.

One of the key objectives of agile project management is the ability to get to market quickly, in small manageable delivery sizes. A project delivery framework that allows an organisation to get to market quicker and efficiently, whilst supporting change, is exactly what is required to remain competitive in today's fast paced and online market place. No longer could organisations afford to go through rigorous, documentation heavy projects that were laborious and time consuming. Resulting in lengthy projects that were unable to support change, and would end up being irrelevant and outdated by the time they were delivered to market. Due to the fast-paced environment organisations find themselves in, it is no wonder that Agile has fast become the preferred approach to project delivery. Let us now review the importance of understanding risk and the management of risks.

RISK MANAGEMENT

According to [5], Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning and controlling risk on a project. The objectives of project risk management are to increase the likelihood and impact of positive events, and decrease the likelihood and impact of negative events in the project. As such project risk management is an important aspect of project management. As highlighted in [6], risk management has become a core part of project initiation and execution since its form recognition in projects in the 1980s. As detailed in [7], project management techniques are designed carefully so that the project manager can run the project successfully by minimising the risks and other negativities. Also, as highlighted in [5], project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives such as scope, schedule, cost and quality. As highlighted in [8], a risk has three essential components: uncertainty, loss and finite duration. There's always uncertainty as to whether a risk will occur. If an item is certain to occur, we instead call it an issue. Risk although traditionally viewed negative effect, may or may not be so. In fact, a risk once understood, may turn out to have either a positive or negative effect. As highlighted in [9], risks are often thought of only as hazards, even though they can present significant opportunities and possibilities for organisational innovation and new competitive advantage leading to short- and long-term profitability. Project risk is underpinned by the very nature of the uncertainty and changes that complex projects attempt to introduce within organisations. As detailed in [2] risk management is a key component to an organisation's very existence, without, it will leave organisations' vulnerable.

It is important that organisations understand the impact that each identified risk can potentially have on the project, and organisation. As detailed in [10], risk management can reduce uncertainty and increase

the possibility of success of projects. This therefore translates into how a project team manages any risks they identify during the project. Three factors that impact an organisations attitude to risk is that of Risk Appetite, Risk Tolerance and Risk Threshold. As highlighted in [11], because a risk may not occur, we have a powerful means of managing it; namely, preventing it from occurring.

According to [5], Risk Appetite is the degree of uncertainty an entity is willing to take on in anticipation of a reward. Risk Tolerance is the degree, amount, or volume of risk that an organisation or individual will withstand. Whilst, Risk Threshold refers to measures along the level of uncertainty or the level of impact at which a stakeholder may have a specific interest.

Risk Appetite, Risk Tolerance and Risk Threshold are factors that contribute to the risk appetite of an organisation. Let us now look at how risk management can be supported in the change driven agile approach to project management.

AGILE RISK MANAGEMENT

A fast paced, flexible, change-driven approach to project management, allows organisations to remain competitive in today's ever-changing market place. As highlighted in [12] risk management can be perceived as somewhat contrary to the more lightweight processes using in Agile Methods. Some critics of the framework argue that agile project delivery opens organisations up to more risk, whilst others argue that agile project

delivery reduces risk, as the change-driven approach allows the project to rise, and quickly work to reduce risks as the project's product backlog is revisited and reprioritised each iteration. As detailed in [13] the inherent cadence and iterative nature of Agile practices make them well suited for the management of a wide range of risk commonly encountered in product development and related projects. As defined in [14], a Product Backlog is a prioritised list of the work necessary to bring the product into existence.

Agile (change-driven) approach to project management involves many ceremonies that are unique to this framework, and do not exist in the plan-driven approach to project management. Some of the key ceremonies include Daily Stand-ups, Product Backlog Prioritisation, Iteration / Sprint Planning, Retrospectives and Iteration Showcases. As such, as detailed in [15], contemporary risk management should be looked at as an integral part of the agile process and decision making.

From an agile risk management perspective, there are three key agile ceremonies that can be employed to help perform risk management:

- Daily Stand-ups
- Product Backlog
- Iteration Planning (Prioritisation Sessions)

The below table is a clear representation of how these three key agile ceremonies are used to help perform risk management.

Initial Risk Discussion	Daily Stand-ups
Risk Identification & Register	Risk Register
Risk Action Plan	Added to the Product Backlog
Risk Action Prioritisation	Iteration prioritisation sessions (next iteration planning meeting, will review the product backlog)

Let us now look at the three components of risk management and how this is incorporated within an agile approach to project management, i.e. agile risk management.

Identify & Analyse the Risk

The first stage of risk management begins with the identification of the risk. As part of risk identification, within an agile framework, the risk should be raised and discussed with other project team members at the daily stand-up. If agreed that the identified risk, is indeed a risk, then it should be raised. Raising a risk involves noting it down on the Risk Register and the initial heat map reflection of the status of the risk in its current identified and untreated state.

- Daily Stand-up
- Raise & discuss risk
- Risk noted in Risk Register & Heat Map

- Raise the risk in the risk register
- Heat map updated to current reflect risk status

Control, Develop & Perform Risk Actions

A regular risk meeting needs to be held to discuss all the open risks noted on the risk register. This will give the project team and the risk representatives an opportunity to assess the risk, and decide on how the risk should be actioned. Details of which need to be kept in the risk register. Whilst action items need to be raised as work items, to be added to the Product Backlog, for prioritisation in the next product backlog prioritisation session. This is an iterative process that will continue while the risk is worked on. Note, that within an agile project management framework, the risk actions are added to the product backlog, and when the risk actions will be worked on are continually discussed and reviewed, as part of the regular product backlog prioritisation sessions. Note, as highlighted in [11],

project risk should be your foremost concern when deciding how to proceed with a project and assign project features to iterations – remember, the riskiest ones should usually come first. This ability for agile projects to absorb change is one of the most important aspects of agile project management. This is what allows agile projects the ability to overcome risks more quickly than those in a traditional sequential approach to project management. This ensures the risk is actioned in a timely manner. Risks are closed out a lot quicker in agile, than otherwise could be in a traditional sequential approach to project management. As highlighted in [16], agile risk management involves promoting the visibility of risk, ensuring collective ownership and accountability in relation to risk, and supporting informed decision making in an environment that is often founded on people-centric principles.

The following steps make up the Control, Develop & Perform Risk Actions, which are iteratively performed, until all risk actions are closed out.

- Regular risk meeting
- Risk & control measures discussed and noted
- Follow-up Risk Action Meeting
- Risk action plans discussed and noted
- Risk Actions added to Product Backlog
- Risk actions prioritised in next iteration planning session

Monitor & Closure

The risk register and the product backlog provide the main avenues by which the risk actions will be performed. Once these are complete, the risk will

move into a monitoring mode, to ensure the risk is fully actioned. The Heat Map should be updated to reflect the final status. The Risk Register should also be updated to reflect the actions taken before moving towards closure. Once closed the risk will remain as a closed item on the risk register for future reference if required.

Therefore, the following steps make up the Monitor & Closure Actions, which will be performed to close out the risk.

- Heat map updated to reflect risk status
- Risk register updated to reflect risk status
- Product backlog prioritisation to review risk action until it is prioritised for inclusion in a subsequent iteration

Identify & Analyse the Risk

Within this first stage of risk management, the risk will be identified and as such, discussed and raised during the next Daily Stand-up. If the risk requires an action plan, then the components of the action plan should be added to the product backlog and prioritised. This prioritisation will need to form part of the next product backlog prioritisation, which is a great deal sooner, than what can be supported in the traditional sequential approach to project management.

Control, Develop & Perform Risk Actions

Within this stage of Agile Risk Management, we will raise the Risk in a Risk Register. It is useful to document, at a minimum the following information, in the risk register that is used:

Risk Identifier
Risk Owner
Inherent Risk Rating
Control Type
Control Description
Control Owner
Control Effectiveness
Residual Risk Rating
Action Plan
Action Plan Description
Action Plan Status
Action Plan Target Date
Future State Risk Rating
Risk Status

If the project team is currently using an Agile application or tool, many tools now offer Risk Management add-ons, allowing risks to be managed within the same tool the project is using to manage the agile project. One such popular tool for managing Agile Projects is Atlassian Jira. The Atlassian Jira tool

supports various risk management add-ons that can be used to manage risks. If one of the risk management add-on tools is utilised, then generally the above data elements will still need to be added when logging a risk. The above information will in general, be supported as data elements that can be added to the risk when raised.

Each of these risk register elements are further expanded below, to highlight the type of information

that this risk register element should contain:

Risk Identifier	A unique identifier series to be applied to the risk register.
Risk Owner	The person responsible for managing the risk.
Inherent Risk Rating	The rating associated to the risk in its identified, unmitigated form. The rating applied should consider impact, likelihood and risk.
Control Type	Recommend drop-down list with the following options: Detective; Preventative; Recovery.
Control Description	A description of the type of control in place.
Control Owner	The person responsible for assurance of control.
Control Effectiveness	Recommend drop-down list with the following options: Effective; Ineffective; Requires Attention; Robust.
Residual Risk Rating	The rating associated to the risk during control. The rating applied should consider Impact, Likelihood and Risk.
Action Plan	A summary of the action plan.
Action Plan Description	A description of the action plan to be undertaken.
Action Plan Status	The current status of the action plan.
Action Plan Target Date	The planned target date of the completion of the action plan.
Future State Risk Rating	The rating associated to the risk post action plan completion. The rating applied should consider Impact, Likelihood and Risk.
Risk Status	Recommend drop-down list with the following options: Raised, Open, Control, Action Plan, and Closed.

Plot the Risk on a Heat Map.

Once the risk is raised, then the risk needs to be added to a Risk Heat Map. If the risk is being managed manually in a risk register such as a spreadsheet, then the addition of a risk to a Heat Map will be manual. However, if a software add-on is used, then the Risk Heat Map, will generally be available to generate automatically. As the risk transitions through different risk ratings, then the risk will see its position on the Heat Map change, to reflect this. If manually maintaining the Risk Register, then the Risk Heat Map needs to be kept in sync also. Whereas if the project risks are being managed in an integrated software risk management package, then the Heat Map will generally be generated and updated automated once the risk has been raised, and ongoing when the risk rating changes.

- Analyse the Risk.
Add any risk actions to Backlog for prioritisation
- Address the Risk.
Backlog prioritisation, includes actions prioritised from risk register.
- Review Heat Map.
With risks highlighted
- Monitor the Risk until Closure.
Regular Risk Meeting - review risk register, heat map update with risks and any changes to the risk rating based on control and actions in flight.

Once the risk has been identified and documented, the risk register helps to identify the subsequent steps and action plan. Once in flight, the risk can quite quickly be monitored, managed and

brought under control. This is one of the key benefits of agile risk management. The risk is brought to light as soon as it is identified, and discussed and worked on, once it is prioritised as such. Hence the very nature of agile risk management lends itself to managing risk more easily.

CONCLUSION

Risk Management is an important aspect of project management. Without it, the success of the project and the organisation can be brought into disarray. As highlighted in this manuscript, agile risk management is very accommodating of risks. Risks are raised immediately to the project team when a risk is identified. Risks are documented and analysed, and if using a software add-on, the maintenance and tracking of risks becomes very easy to manage. Automatically generated and up-to-date Heat Risk Maps, form part of visual tools that can be used to visually highlight the current risk status.

As highlighted in this manuscript, agile project management is the new way of working and provides how projects can deliver quicker products and services to market, within an iterative, change-driven approach to project management. By embracing change, this more flexible manner of working, can more easily work to address any risks and prioritised actions that are required to address these risks. This article has highlighted the agile concepts such as daily stand-ups, product backlogs and product backlog prioritisation sessions that all help contribute to the successful management of risks in an agile project framework. Thus, forming the way in which risks can be managed successfully, agile risk management.

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