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Second Edition[1]

Use of Agile with XP and Kanban Methodologies
in the Same Project
Ira Barash

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By Ira Barash

Abstract

This paper discusses the advantages of using a combination of project management methodologies Agile / Scrum with XP (Xtreme programming) and Kanban in a complex project in a large corporation to reduce project risk. In addition, the importance of communication of project accomplishments and risks to the program and portfolio managers and lines of business (LOB) is covered. Finally, the Project Management Institute (PMI) latest PMBOK guides are reviewed to see how PMI has addressed the use of different methodologies.

Purpose

The purpose for this paper is to show through the presentation of concepts and use of an example that more than one project methodology is possible in a single project.

Second, continuous learning by experimentation and the use of retrospectives during the project is the best way to ensure success.

Introduction

No tool or technique is perfect. Waterfall methodology is described in the PMBOK guide from PMI and XP, Scrum and Kanban techniques are addressed by the PMI-ACP certification process. XP, Scrum and Kanban are members of the Agile and Lean toolsets. PMI Institute and references in literature agree that finding motivated people and using the correct project management toolsets at the right time are important to completing a project successfully.

Agile/Scrum and Extreme Programming (XP) are being widely used in companies to accomplish software development projects. In a small project, a single team approach works well. As projects grow larger and more complex, multiple scrum teams may be employed.

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[1] *Second Editions are previously published papers that have continued relevance in today's project management world, or which were originally published in conference proceedings or in a language other than English. Original publication acknowledged; authors retain copyright. This paper was originally presented at the 7th Annual UT Dallas Project Management Symposium in Richardson, Texas, USA in August 2013. It is republished here with the permission of the author and UT Dallas.*

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Other internal teams and external suppliers may be required to complete these larger project. These entities add complexity to the project. My experience shows that Agile project teams do not have the time to interface with these groups that are outside of its core team. Constraints placed by the time box approach forces emphasis on the Scrum backlog. My recommendation is to split the work and use both Scrum and Kamban teams.

In this paper, the similarities and differences of Scrum and Kanban are going to compared and contrasted. Then, this paper will demonstrate that these two methodologies may be used together to make a project perform in a more efficient and effective manner.

Scrum-ban is the term that it used in literature. I am not proposing the use of Scrum-ban. I am proposing two separate streams. One stream that uses Scrum or Scrum-ban with XP programming for application development and reporting, and another separate team that uses Kanban for everything else as the chosen methodologies.

Mortgage Process implementation is used as an example to show how a large complex project may effectively use the concepts of Scrum (or Scrum-ban) with XP programming and Kanban as two separate teams.

Problem to Solve

The application and reporting portions of the project work well with an Agile/Scrum approach. The portion of the project where other internal departments and external suppliers does not fit under the Agile Framework is where Kanban is used.

The internal functions include Infrastructure, Accounting, Treasury, Data Warehouse, EDI, Credit Card penny testing, and Security (ITO). The external stakeholders include vendors that supply interfaces like Core Value (Flood), Fannie Mae, Freddie Mac, FHA, and many others. The major issue is that these internal and external stakeholders cannot satisfy the constraints placed by the time box approach that Agile demands.

Why should Waterfall not be used?

My original thought was to use Waterfall methodology. It was used in the past to do Mortgage projects. It involves processes defined in the PMBOK Guide. A common set of processes as described in the guide are: Integration, Planning, Execution, Monitor & Control and Closing.

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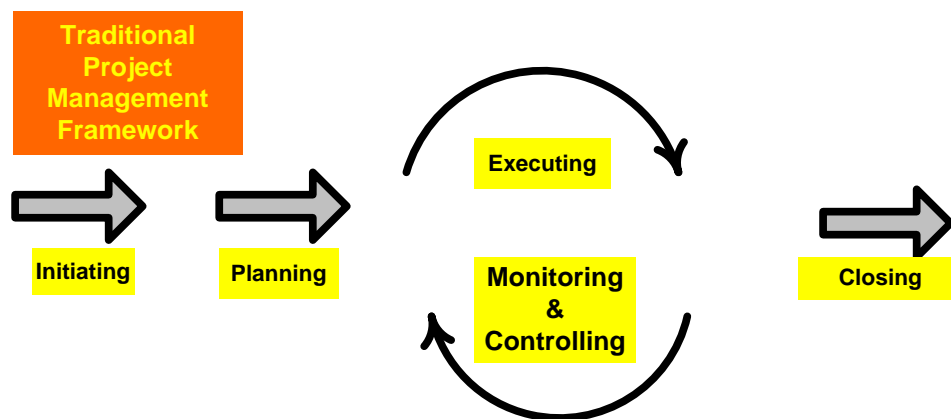Second Edition[1]   Ira Barash

Chart from Scrum in Action – Page 14

The project starts with Project Charter that defines high level functionality. After the project is funded by the Business and scheduled and approved by the Project Management Office, the planning stage begins. During the planning phase, all of the project requirements are determined through requirements, scope, and work breakdown structure (WBS) documents. The schedule is determined. A baseline is set. Any changes to the requirements including schedule, budget and scope changes must be submitted and approved through a formal change request process.

The Project Manager forcing methodology over work and the rigidity of this process adds time because changes are not encouraged.

The final nail is that the entire project is delivered to production after the system is programmed, installed and tested completely.

This approach does not fit with Agile methodology. First, the Agile methodology demands that changes be incorporated into the project when they are realized. Change requests and other demands mandated by the Waterfall method are not conducive.

Secondly, the type of items that are outside of the application development and reporting do not require this type of formal structure. The type of work to acquire infrastructure and test interfaces does not need the overhead of Waterfall.

Finally, production ready code and frequent implementations do not fit into the Waterfall Methodology.

Similarities of Scrum and Kanban

The similarities of Scrum and Kanban (Henrick Kniberg) are:

- Both are Lean and Agile methodologies
- Use pull scheduling
- Limit WIP (Work-in-Process)

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- Use transparency to drive process improvement through retrospectives
- Focused on delivering releases of software early and often
- Based on self-organizing teams
- Required to break work into pieces
- Require the release plan to continuously optimize based on empirical data driven by velocity and lead time

Prescriptive versus Adaptive

Prescriptive means more rules to follow. Adaptive meaning "fewer rules." The most extreme case is 100% prescriptive which means that there is a rule for everything. In contrast, 100% adaptive means "Do Whatever," where there are no rules.

Agile methods are sometimes called "Lightweight methods" because there are less rules than traditional methods. Agile Manifesto suggests "Individuals and interactions over Processes and Tools."

Differences between Scrum and Kanban

Agile / Scrum is more prescriptive than Kanban because Scrum has more rules and constraints; therefore, less options are open. For example, s, and Kanban being more adaptive does not. The advantage with Kanban is that there are almost no rules. In the business environment, "Doing Whatever" can contribute to meaningful results.

Other Agile methods like XP (extreme programming) have more rules than Scrum.

XP includes most of the rules of Scrum plus engineering rules like test driven development and pair programming. These types of constraints work well for software development; therefore, recommended.

Mix Tools and Do Not Limit

Mix and match the tools as needed. A successful Scrum Team should use most of the elements of XP. Kanban teams can use daily standup meetings, a scrum practice. Some Scrum teams limit their queues, a Kanban Practice. The point is whatever works, use it.

A final point is to use the rules of a particular methodology. If not, it becomes confusing. If Agile / Scrum is being used, use the structure as described below, the time box approach and cross-functional teams.

Agile/Scrum & XP Programming with Sprints & Timeboxed Approach

The flow of Agile/Scrum method is shown below.

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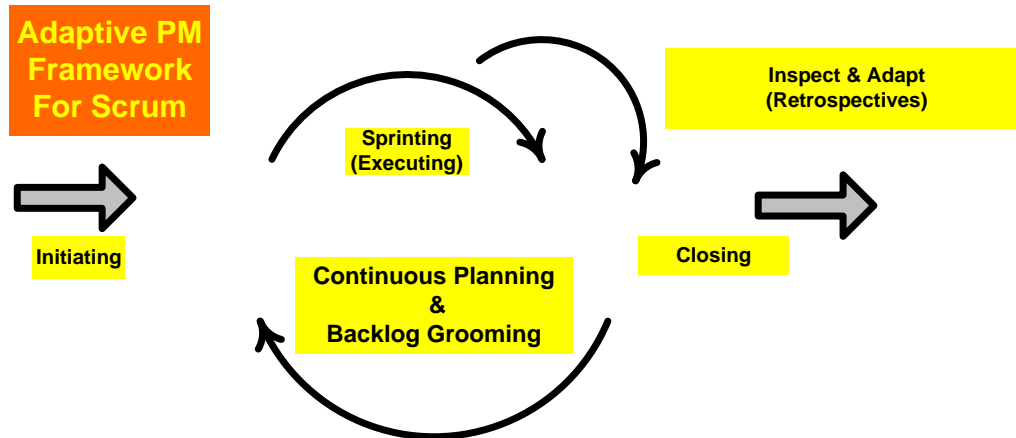*in the Same Project*
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Chart from Scrum in Action – Page 14

Scrum/Agile Team

Scrum works with one-to-many small teams (10 or less). A product backlog is created as a starting point. It is prioritized. Each backlogged item is rated. The rating is determined by the team. The sprints are determined. Velocity is calculated by looking at the tasks that are included and their ratings. Story Points are used as a measure of Velocity. Sprints, if done properly, use the story points and the ratings to level the effort. Burn down charts may use story points or days/hours to show results.
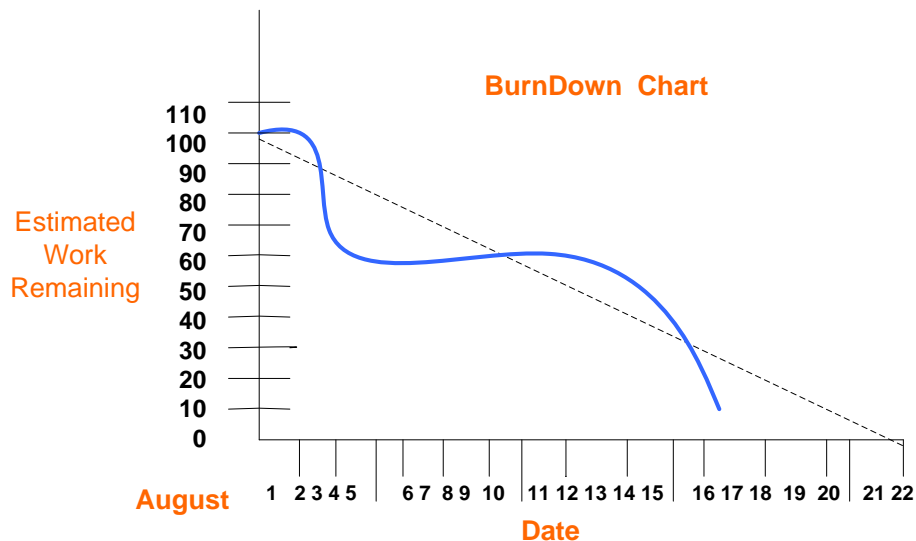
The sprints are planned for a certain length using a time box approach. The goal is to complete each of the items accepted by the team in the amount of time specified. The output will be production ready code that can be released. Retrospectives are used to

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analyze the results of the previous sprint in order to make improvements in the upcoming sprints.

As mentioned previously, the application portion especially for Web development and the reporting aspects of the project work very well with the Agile approach.
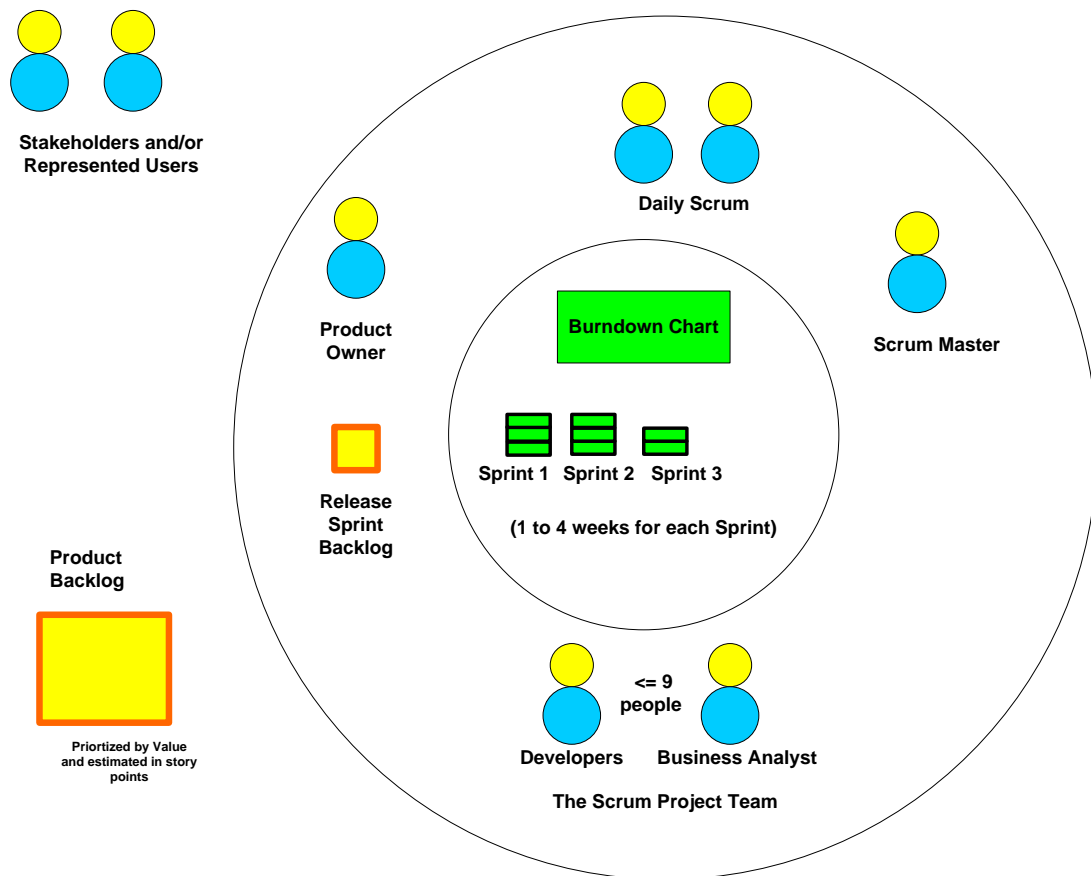
Kanban with WIP Limits

As the Agile portion of the project progresses, requirements are spawned that require other internal groups and external suppliers to be contacted to perform work. My suggestion is to create an index card or sticky note and let the Kanban team work to complete these tasks. Kanban uses a pull principle. Once the task is completed, the team selects new work by bring it into the queue. The advantage to Kanban is that it has a limited number of prescriptive methods. Time box approach and cross functional teams are not required by Kanban. The team can work at its own speed and get the results required.
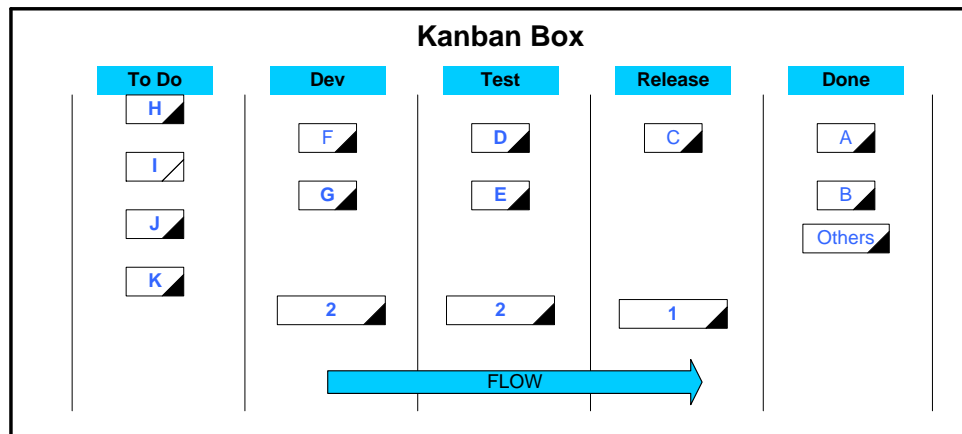
Mortgage Example

The Scrum/Agile team in the Mortgage example determines that it will do 4 week sprints. The Product Owner, scrum master and team review the backlog by rating each change and prioritizing the tasks. The team decides to organize the work by priority and drive the work through the queue by choosing the highest priority items first and matching the complexity it introduces into the sprints.

The items are chosen for the first scrum. The cross functional team made up of developers, designers and an architect reviews the items selected, create estimates and agrees that it can do the tasks assigned in the time allowed for the sprint. The team works to complete the tasks. Their goal is to finish with production ready code.

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Kanban Team

A second backlog is created that will be used by the Kanban team. This backlog is made of needs that are generated from the backlog. The items are infrastructure in nature like installing servers, providing security for the project, testing load balancers and testing interfaces from vendors. The team interfaces with internal groups and external suppliers. The work is selected by the team based on priority. The limits on each of the queue force the team to finish the work and move it to the next queue before new work can be introduced.

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Kanban Box

To Do	Dev	Test	Release	Done
H	F	D	C	A
I	G	E		B
J				Others
K				
	2	2	1	

FLOW

Organization of the Mortgage Project

Because of the size of a Mortgage application, a program manager may be used to oversee the Agile Sprint and Kanban Teams to facilitate in the coordination between all of the groups. The program manager reviews the work to insure that the overall project works in a coordinated manner. The Program manager does not control any of the work of the team. He makes recommendations based on his view.

Communication With The Stakeholders

Communication to stakeholders is planned, managed and controlled by the program manager. This is important because the program manager controls the flow of the project. Accuracy of communication to the stakeholders, whether internal or external, is especially important. Accurate current status of all of the functional aspects, schedule, and cost to all concerned whether it is formal or informal is paramount.

Food for Thought Section

Scope Creep in Agile

In Scrum, there is no scope creep because change is accepted. Because of the short iterative process of the sprint and the use of the product backlog, changes may be added at any time. The product owner must make the proper choices of what to include in the next sprint. The customer sees the results in the demonstrations after each sprint.

Earn Value Analysis

It is important to stay on schedule. Earn Value Analysis is a key to measuring performance. Three key components are cost performance, schedule performance and budget forecasting. Cost performance may be reviewed by calculating cost variance

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and cost performance index. Schedule performance may be shown by calculating schedule variance and schedule performance index. Budget forecasting is determined by calculation up to three different measures of cost to completion and variance to completion. These values can be graphed to show where the project is at any time.

Testing

Manual and automated testing and continuous integration testing are essential. A test plan is mandatory to insure that every component of the system is complete. Test driven development (TDD) is effective to churn out good code.

Team Building

Getting a team to high levels of performance takes thinking as a team and understanding behavior. The Bruce Tuckerman model "Storming, Forming, Norming, Performing & Adjourning." helps teams get to higher levels of performance.   Other models like the Kersey Temperament Model help managers form teams that are cross-functional and can achieve their project goals of working together in a self-organizing team as well as people who can lead.

Why Retrospectives are important

Learn from successes and current failures. If the desire is to improve the performance of the team, retrospectives should be scheduled frequently and on a regular basis. Secondly, ensure that they lead to real change.

The use of Agile techniques such as Kanban and Scrum are not the goal. Continuous learning is. Use short feedback loops to elevate change. Keep experimenting, learn to learn from failure. Do not worry about getting it right from the beginning.

"The real failure is the failure to learn."

Conclusion

Scrum with XP development may be most effectively and efficiently used for the development of the application and reporting.

Kanban may be used most effectively and efficiently to track and complete interfaces and infrastructure type issues associated with the project that are more suited to this method.

Both teams perform well because the work using Agile Lean methods is matched to the proper techniques. Development and reporting work is best suited to prescriptive flow including time box methods prescribed by Agile Scrum.   Infrastructure work with interactions to internal departments and external suppliers is best completed utilizing the natural adaptive flow of Kanban.

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Risk is mitigated because Agile forces teams to identify issues quickly. Frequent incremental delivery shows results early. In addition, the choice of which Agile method to employ makes the project more efficient and effective.

Waterfall should be used less frequently if at all because of its inefficiency. Having to define requirements upfront and use change control to make changes does not allow for quick responses. It is simply overkill and inefficient in many cases.

Other tools may be applied. Graphical solutions to do design and architecture aid in high quality design. Automated testing helps to assure great results because of speed and repetitive nature of results. Understanding management models helps to build good teams.

Most importantly, continuous learning and improvement through the use of retrospectives helps to insure a very successful outcome. Identify quickly what works and keep improving it. Eliminate what does not work and replace it.

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About the Author

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Ira Barash is married and employed by VisionIT in a contractor role working at HP as a project manager. Previously, he worked for two years as a contractor at Capital One Financial through Strategic Staffing in the mortgage application and infrastructure areas. Barash received his PMP® from the Project Management Institute (PMI®) (2012), a certificate in Project Management from the Graduate School of Management at the University of Texas at Dallas (2007), a Masters of Business Administration (MBA) in Finance from Wright State University (1989) and a Bachelor of Business Administration (BBA) in Quantitative Analysis from the University of Cincinnati - Carl H. Lindner School of Business (1976).

From 2010 to 2012, Barash was Volunteer Commissioner for the City of Plano on Community Relations Committee. He and his wife actively support the Plano (Texas) Symphony Orchestra through volunteering and financially as a Virtuoso Member. He is a member of PMI, the PMI Dallas Chapter and Toastmasters. Ira's passions are to be a terrific husband, have challenging work assignments, live a healthy lifestyle including traveling, exercise, writing and supporting of non-profits financially, and by volunteering.

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