

Application of Agile Beyond Software Development

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Abstract

This paper explores various academic articles covering the origins of Agile methodology and applications of Agile beyond software development. The articles are mostly in agreement as to the foundational principles and definitions of Agile methodology, while exploring the effectiveness of applying the tools and techniques to different industries. This paper examines the flexibility of Agile methodologies while exploring multiple successes in the implementation of specific Agile frameworks, such as Scrum, in a variety of scenarios.

Keywords: Agile, Agile Business, Agile Methodology, Scrum

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Numerous examples of the cross-pollination of ideas may be made, especially between the technology industry and other businesses. The rate of innovation and change in the technology industry drove the need for new and more efficient methodologies for organizing and completing work on a timely basis. Prior to the “Agile movement”, the industry took years to develop products using a technique called waterfall (Kramer, 2019) that was focused on major, monolithic releases. This waterfall method consumed a lot of time and resulted in products that often failed to meet customer needs or that were obsoleted before their release. In the late twentieth century, the foundation for Agile was established. Lean, Kanban, and Scrum are the three major types of Agile currently in use. The lean method attempts to target and then to reduce waste. The Kanban method is focused on individual tasks, their interdependencies, and the effort required to complete the tasks. Scrum focuses on short, rapid cycles of work called sprints and incorporates daily stand-up meetings in which the team quickly discusses the tasks of the day. (Rigby, Takeuchi 2016) For this paper, we will focus on Scrum methodology and how this way of working has proven effective, thus enabling adoption into business management beyond its Information Technology roots.

Literature Review

In Kramer and Wagner’s (2019) journal publication, they found that Agile takes five to six years to replace the aged waterfall methodology and that the effort resulted in flexibility and improved operations. The foundational componentry of Agile and the three main varieties (Lean, Kanban, and Scrum) are detailed by Rigby, et. al. in their (2016) publication, which also speaks to initial leadership reaction to this new methodology. Moving us away from perceived anarchy, Cervone (2014) calls for leadership involvement in his article discussing the adaptation of Agile

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methods. Applying Agile to software development, Saito (2018) documents how well Agile works in its environment of origin. Underscoring the importance of correct team sizes, Munoz (2018) discusses his findings in the practice of Agile. Som de Cerff (2018) emphasizes why Scrum is the ideal form of Agile and why it is more pervasive than Kanban or Lean. Huckabee (2015) starts to take us away from information technology (IT) into other industries while discussing how the feedback loop in Agile is a real advantage. An alternate view is afforded by Borkovich (2018) showing us that Agile is not a fit for every organization. Collins & Wilson (2018) and Dulock & Long (2015) both discuss the application of Agile to the library arts, specifically library operations. Flood, et. al. (2018) share their experience of the positive results of Agile in the healthcare industry. Showing that Agile, and specifically the Scrum methodology can transcend IT, Pope-Ruark, R. (2012) and Loewus, L. (2017) discuss the benefits of Agile in the education sector. Shifting to a very technologically conservative group, Kerr, J. (2017) talks about how to bring Agile into a legal firm. In closing is Bellman's (2015) short review of Jeff Sutherland's book, which clearly supports the trend of Agile becoming pervasive throughout the business world. Jeff Sutherland is credited with introducing Scrum framework to the world.

Discussion

Agile methodology got its start in the late 1980s and perhaps even a little sooner depending on who you ask. The government is typically a "late adopter" of information technology, lagging behind their industrial and commercial counterparts. An interesting aspect of Kramer and Wagner's report (Kramer, & Wagner, 2019) is their mention of the government adopting Agile in 2004. This indicates that the government was not too far behind industry in its adoption of Agile. Prior to Agile, organizations had been using waterfall methodology to manage software development projects. A major problem with the waterfall method was lengthy

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development cycles that stifled agility. A development team would start work developing a software product, not stopping until it was fully tested and ready for release. This process took months and sometimes ran for years.

A good example is Microsoft Office, which was updated every couple of years with a major release (e.g. Office 95, Office 98). In between these major releases, updates and patches were made available as needed to solve bugs or security issues. Fast forward to 2011, Microsoft released Office 365 and changed the cycle. This new version of Microsoft Office very different as it is available as a subscription service. For software developers, this aligns nicely with Agile. With Agile methodologies, such as the Scrum framework, software publishers are enabled to release new versions of the software daily, weekly, monthly, or on whatever time schedule makes the most sense for the software publisher. The subscription model, while enabling shorter development cycles, also transforms large revenue spikes into a steady subscription stream. However interesting, revenue impacts are not addressed in this paper.

With anything new there is an adjustment period. Facing the unknown, we often succumb to fear, uncertainty, and doubt. In the early days of Agile, some executives equated this new method with anarchy. (Rigby, Sutherland, & Takeuchi, 2016) It appeared chaotic and fast moving with the same requirement for the boss to assign tasks to the workers.

In practice, the Agile Scrum framework is very focused and structured. The project starts with the assembly of a small team who possesses all of the knowledge and skills to accomplish a specific set of tasks. This team is guided by a project owner who is ultimately responsible for delivering the product to the customers. The project owner manages the backlog of tasks and shares the tasks with the team in the sprint planning meeting. The sprint then has its own backlog of tasks and it is the team's responsibility to estimate the effort. The project owner can remove or

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add tasks based on the desired timing for the sprint. Inside of each sprint are daily stand-up meetings, lasting about 15 minutes. A key part of the Scrum framework is rapid and frequent prototyping, which allows problems to be detected and corrected quickly. The end of each sprint is scheduled based on the completion of tasks and is marked with clear deliverables. That is, all involved are in agreement with the definition of the sprint completion. At the end of each sprint is a retrospective, where lessons-learned are fed into the front end of the next sprint.

Leadership involvement is still important in this new methodology. Although the workers are empowered, leadership must engage in the planning stages while maintaining a long-term focus without being dragged into the daily minutiae. (Cervone, 2014). Documentation is critical to capture knowledge, although keeping that documentation up to date can quickly become an insurmountable task. Another benefit realized by the smaller Scrum teams is an increase in knowledge sharing and management. (Saito et. al., 2018) Putting emphasis on the documentation process as part of each sprint resulted in documentation being more current and more relevant. The size of the team also encourages better team cohesion and communication. Smaller teams are proven to maintain better communication and increased stability. (Muñoz et. al., 2018) Improved communication on the team yields results. The same is true for communication outside of the team. In a rapidly iterating process, it is critical for the team to get early and constant feedback from customers. (Huckabee, 2015). This constant communication allows requirements to change quickly with minimal loss of effort. Rapid prototyping allows customers to get a sense of where a product could be headed, at the same time allowing them to be part of the development process.

Agile is not a one-size fits all proposition. While many organizations across multiple industries have had great results with Agile, others have not had the same success. Ethnography

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requires long-term extended fieldwork. Although multiple attempts were made to apply Agile to this discipline, they all failed. It was simply not a fit with the nature of the work. (Borkovich, 2018). Moving past what appears to be an outlier, Agile has been translated into many organizations and fields beyond IT with great success. The Royal Netherlands Meteorological Institute adapted Agile Scrum framework into their own Agile Way of Working (AoW). They were successful in applying their AoW to a research and development project and completed the feedback loop to improve their next project. (Som de Cerff et. al, 2018) Delivering technical services in academic libraries requires structure around change management and iterative planning. North Carolina State University (NCSU) adopted Agile methods to transform the way their staff works. (Collins & Wilson, 2018). NCSU realized improved communications, better resource usage, team cohesion, and increased efficiencies after adopting Agile. The digital initiatives group and metadata services department at the University of Colorado Boulder (CU-Boulder) Libraries found that their adoption of Scrum resulted in better service for their customers and more efficient use of their time. They were able to morph their work pattern from unpredictable peaks and valleys to consistent and stable. With this newfound certainty, the team is better able to prioritize competing priorities. The new, shorter, and compacted meetings are appreciated as well. (Dulock & Long, 2015). The Maya Health Alliance used their own customized Agile framework called Agile Global Health to manage a case study involving diabetes programming in Guatemala. (Flood et. al, 2016) They ran into challenges in the field and they credit their Agile methodology for enabling them to uncover and resolve unforeseen problems. Improvisation and adaptation are factors they indicated as contributing to the success of their program. Shifting to higher education, Professor Pope-Ruark of Elon University finds Scrum framework to be useful for her students. She leverages the ability to break work down

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into smaller pieces, making large projects easier to manage. The students enjoy better communication and buy-in to their work due to their high levels of involvement. Group sizes of four to five have proven the most effective. (Pope-Ruark, 2012) In Chesterfield County, Virginia, some middle school teachers have adopted Scrum framework to help their students with organizing their projects. The teachers have been impressed by how quickly and how effectively the students are using Agile. The students appreciate being able to work independently, focusing on specific tasks and celebrating sprint completions. The teachers see the process as preparing their students for the job market, with the students gaining organizational skills that will be with them for life. (Loewus, 2017) The legal field is known for being highly conservative and slow to adopt new practices and technologies. The hardest part is getting the team on board to use something new and different. Once they accept Agile into their daily operations, they need to understand how to adjust Scrum to the specific needs and the tasks unique to a legal firm. While adjustment is needed for a law practice, Agile is a game-changer for the legal industry and should be seriously considered. (Kerr, 2017)

In his review of “The Art of Doing Twice the Work in Half the Time” by Jeff Sutherland, Geoff Bellman predicts that Scrum will be pervasive across the entire business world. (Bellman, 2015) Sutherland calls Scrum “the most important workplace innovation since the computer chip.” Noting that up to 85% of employee effort is lost as waste, Scrum promises organizations to realize efficiencies previously unattainable.

Based on the current literature, Scrum is a universally applicable methodology based on proven effectiveness across multiple industries. Scrum brings increased efficiencies, improved quality, and increased productivity. The future of business will very likely involve the incorporation of Scrum or some Agile variant in its daily operations.

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Conclusion

Known as the Scrum framework, the Scrum method, or simply Scrum; this is a revolutionary way of working. While all of the ideas may not be new, the way they are organized makes it a highly efficient and effective way of managing projects and operations. The age-old question, “How do you eat an elephant?” is answered “One bite at a time.” Scrum takes this one-bite at a time approach and organizes it into a way that enables right-sized teams to achieve cohesion, to work together, and to improve their communications and sense of direction. Although Scrum started as an Agile method for software development, it has a much further reach and greater application. Scrum is flexible, malleable, and can be shaped to fit almost any organization in almost any industry. When something is this effective in increasing product quality and speed to market, it makes sense to give it a try. Proven effective in many of large technology companies, Scrum will become pervasive across the majority of industries and organizations.

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