

## Adoption of agile development methodologies

### Adopción de metodologías ágiles de desarrollo

NUÑO, Carlos\*† & FRAGOSO, Héctor

*Universidad Iberoamericana*

ID 1<sup>st</sup> Author: *Carlos, Nuño*

ID 1<sup>st</sup> Coauthor: *Héctor, Fragoso*

DOI: 10.35429/JMME.2022.10.6.9.13

Received March 19, 2020; Accepted June 30, 2022

#### Abstract

The digital technologies are transforming our world as deeply as written, the changes threaten all enterprises in all fields. Each company should be reinvented or eventually go out of business. Agile has potential for companies respond in fluid and sensitive manner as required by the context of current digital technologies. Agile methods have been adopted in a wide variety of organizational contexts; some methods are more suitable for certain organizational environments than others. In this article we review aspects more important that an organization should be considered for adopting agile software development model. The agile model adoption in technological areas is as important as its adoption in any area to participate in the development of software projects. The management support is essential to lead software development projects to the expected success.

#### Resumen

Las tecnologías digitales están transformando nuestro mundo tan profundamente como escrito, los cambios amenazan a todas las empresas en todos los campos. Cada empresa debe reinventarse o acabar quebrando. Agile tiene potencial para que las empresas respondan de manera fluida y sensible como requiere el contexto de las tecnologías digitales actuales. Los métodos ágiles se han adoptado en una amplia variedad de contextos organizativos; algunos métodos son más adecuados para determinados entornos organizativos que otros. En este artículo revisamos los aspectos más importantes que una organización debe tener en cuenta para adoptar el modelo ágil de desarrollo de software. La adopción del modelo ágil en áreas tecnológicas es tan importante como su adopción en cualquier área que participe en el desarrollo de proyectos de software. El apoyo de la dirección es esencial para conducir los proyectos de desarrollo de software al éxito esperado.

---

**Citation:** NUÑO, Carlos & FRAGOSO, Héctor. Adoption of agile development methodologies. Journal- Macroeconomics and monetary economy. 2022. 6-10: 9-13

---

---

† Researcher contributing first author.

## Introduction

Agile development methods are a group of system development methodologies that share a common philosophy, values and goals. Their primary goal is to deliver software products quickly with the highest possible value to the customer.

Agile development methods use a rapid iterative and incremental development process with high levels of communication and customer involvement, and the agile approach is more people-oriented rather than process-oriented. This means that it relies heavily on individual skills.

The two most popular agile techniques are Extreme Programming and Scrum.

- XP is a set of principles and practices that aims to enable successful software development despite poorly documented or constantly changing requirements in small and medium-sized teams.
- Scrum aims to manage the development process through an empirical approach by applying the ideas of industrial process control to software development.

Organisational culture is one of the most important tasks to study in the organisation and is very important for the successful implementation of an agile model in software development.

## Software development - art or engineering?

People involved in software development generally have an engineering background. A software product can be built in many ways and there is no mathematical model that measures the accuracy of a software design. Other engineering disciplines such as civil, chemical, transport, etc. do have mathematical models that guarantee the efficiency of a product.

In reality, a software engineer cannot guarantee 100% of the success of a product, there are many factors in the different stages of software development that can significantly affect plans, designs, requirements, etc. What he can guarantee is the quality of his product.

In software development, the future is not predictable, you always have to be willing to change. So is a software developer a craftsman? A craftsman has no methods, he is only guided by a set of best practices.

## Traditional Development Methodologies

Traditional development methodologies consist of performing each stage of the project in an independent and linear way. Nowadays it is very difficult to document all the requirements at the beginning of development projects that satisfactorily meet the needs of the users.

The main disadvantage of the married development methodology is its responsiveness to changes and the time the business has to wait for a functional product. As the project progresses, the cost to remedy errors from previous stages is usually very high, mainly because the team must go back one or more stages to correct the problem.



**Figure 1** Traditional Software Development (Consortium, 2012)

## Software Development

An agile methodology always tries to omit everything that does not serve to build a product, such as exhaustive and unnecessary documentation. It is important to mention that agile is not fast and it does not mean quality, on the contrary, it is very likely that a bad adoption of the agile approach will result in the failure of a project.

Implementing agile means putting a lot of emphasis on people, rather than processes and tools. A common mistake in organisations working with agile methods is not to consider that people fail.

Unlike a traditional development methodology, agile builds software iteratively, i.e. the project team plans activities and executes them in a short period of time, with the goal of building and delivering business value in the shortest possible time.

### Why adopt agile?

The main problem in software development is the delivery of full-featured products on time and within budget. The problems solved by adopting agile methods is the customer relationship.

Companies use estimates for feasibility analysis and project planning. However, it is difficult to have enough similar projects in recent years in order to calculate reliable estimates. Requirements, development teams, technologies and customer needs change with every project, and most developers do not develop exactly the same product twice.

In order to build the product that the customer really needs, constant customer involvement in the project is required. This involvement involves interaction between the customer and the development team in order to have a quick response to changes.

The agile method allows the software to be more closely aligned with the user's needs. A user is not clear about their needs when the project starts, with agile the team can continuously explore the business needs and refine them in each phase (iteration).

Agile means following the following principles as part of the software development philosophy (Consortium, 2012):

- Satisfy the customer through early and continuous delivery of valuable software.
- Deliver functional software frequently.
- Welcoming changes to requirements even late in development.
- Work together on a daily basis throughout the project.
- Surround the project with motivated individuals.
- Face-to-face conversation.
- Agile processes promote sustainable development.

- Continuous attention to technical excellence and good design.
- Retrospectives.
- Simplicity.
- Self-organising teams.
- The primary measure of progress is functional software.

### Adopting Agile in Traditional Environments

It is difficult for a company with a traditional development process to respond quickly to unexpected changes, especially if the implementation phase has already begun. Each modification risks affecting the project plan and the organisation of the process.

It is difficult to keep contract variables (scope, price, and time) fixed over time. Therefore, agile companies regulate their customer relationships with flexible contracts instead of fixed ones that predefine functionalities, price and time.

Typical solutions for plan-based companies include:

- Trying to anticipate needs that may change over time during the analysis phase.
- Create an initial detailed requirements specification through official documents.
- Applying more restrictions in contracts.
- Simply trying to please the customer and comply with requests.

All these solutions are not satisfactory for a successful software product. Agile companies are less concerned about variations in requirements. They use an iterative process, in which the customer can refine and modify requirements.

Traditional plan-based companies present the product at the end of the project and it is only then that the customer can test the product. This option maximises the risk of requirements understanding by the development team. Companies mitigate this risk by trying to communicate with customers to explain product delivery issues and use prototypes to allocate additional time in the budget as a precautionary measure.

Agile companies aim to deliver the final product faster as many times as possible, as the team builds products with functionality of value to the customer. The delivery of functionality is incremental within a sequence of releases that appears to best meet customer needs.

Both agile and plan-based companies are looking for the best developers. They have a clear preference for developers who can work in teams over developers with high individual skills.

The success of a project based on agile methods depends to a large extent on the experience of the team members in the methodology and work discipline. Teams perform better when they stay together for a longer period of time than teams with less time working together.

Most blueprint-based companies claim to be familiar with agile methods. However, many project managers have only a superficial knowledge of them. People (customers and developers) do not easily accept drastic changes in traditional environments.

The main causes of non-adoption of agile methods are superficial knowledge of the discipline, resistance to change within the company and customers, and large or geographically separated teams.

While environmental variables (requirements and technology) affect all software development projects, the agile approach can better protect the customer from most of the negative effects.

Development areas are often the drivers of organisational change to adopt an agile approach to software development. Software engineers believe it is important to deliver the highest possible value to their customers. The mistake these organisations make is not involving customers and stakeholders intensively at every stage of the project.

When starting the development of a project, it is important to define the high-level project requirements and to set out the product architecture and design framework. It is recommended that the above activities are developed in an initial iteration (research phase and initial project framework).

### **Shortcomings of the Agile Approach**

Organisations implementing agile should consider the weaknesses of the agile model. The most important of these are listed below.

- Risk management in projects is ambiguous.
- No specific architectural design activities
- Responsibility is not always assumed as it should be
- Ignores the importance of the contractual (commercial) relationship
- Difficult to apply in large groups (more than 10 people)
- Physically distributed work teams make it difficult to understand requirements and to communicate with the client.

### **Conclusions**

Agile methods are becoming more and more common in today's software development industry. Companies see the advantages of applying such practices, but it is difficult to change the minds of many people to understand the advantages of applying agile.

People are fundamental in agile methods, it is important to develop a model that helps to work with physically distributed work teams. Currently the software development industry has specialised staff in different cities and agile does not yet have a model for working on distributed projects.

Agile has proven to be an excellent alternative for software projects, and especially for projects where the urgency is high, the creation of a team spirit, the need to deliver software products that generate value to the customer, and the need to create a team spirit. In today's world I see very few environments where the needs are not urgent.

The experiences and achievements of the agile community, of which I have been privileged to be a part and a driving force, show that agile adoption does not have to be mandated from above and that it does not need to be perfect, planned, or regulated in order for it to take hold and thrive.

**References**

Consortium, C. (2012). Agile Conference. Paper presented at the Agile Conference, México D.F.

David, B. (2012). Beyond Mainstream Adoption: From Agile Software Development to Agile Organizational Change.

Diane, E. S. (2009). The Impact of Organizational Culture on Agile Method Use.

Emam, H. (2009). Using Scrum in Global Software Development: A Systematic Literature Review.

Kevin, V. (2009). The Agile Requirements Refinery: Applying SCRUM Principles to Software Product Management.

Lily, C. (2009). Adopting an Agile Culture.

Martina, C. (2005). Project Management in Plan-Based and Agile Companies, 22, 21-27.