# Deliverable Report

## *Handbook to apply Agile methodology in non-IT research projects*

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[1] PU = Public
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# Summary

This deliverable describes the emergence of agile methodology that revolutionized project management by prioritizing flexibility, adaptability, and customer satisfaction, diverging from traditional approaches. The Agile Manifesto, established in 2001, champions continuous improvement and collaboration over rigid processes, fostering rapid delivery and response to evolving priorities.

The core principles of Agile emphasize customer satisfaction, embracing change, frequent value delivery, and cross-team collaboration, promoting quality and productivity. Despite challenges such as accurate time estimation and maintaining collaboration amid constant change, Agile's application extends beyond software development to diverse projects, fostering speed, control, and predictability through methodologies like Scrum, XP, Kanban, and Lean.

Despite the challenges of integrating Agile methodologies with research and development processes, companies have found innovative ways to leverage Agile principles to enhance productivity and manage complexity. By tracking features alongside user stories and planning short-term iterations, organizations can navigate uncertainties and deliver value to customers efficiently. Overall, the Agile methodology offers a dynamic framework for project management, enabling organizations to drive innovation, respond to change, and achieve sustainable growth in an increasingly competitive business landscape.

# Disclaimer



# Abbreviations

| Abbreviation / Acronyms | Description |
|---|---|
| EC | European Commission |
| EU | European Union |
| GA | Grant Agreement |
| PB | Project Board |
| WP | Work Package |
| WPL | Work Package Leader |

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# 1. Introduction

## 1.1. Agile Methodology Concept

Agile is a set of project management philosophies proposing a specific way of working and organising projects. Each project is "chopped" into small parts that have to be completed and delivered in a few weeks with the objective to develop quality products and services that respond to the needs of customers whose priorities are changing at a faster rate.

## 1.2. Background

The origin of these agile methodologies lies in the software development industry when companies realised that the traditional way of working greatly delayed the delivery of the final product. They involved processes normally based on a closed contract, with very little communication with the workers.

In 2001, CEOs of the main IT software companies met in Utah, creating the "AGILE MANIFESTO". This document was intended as a continuous improvement model in which projects are planned, created, evaluated, and re-planned etc. to optimise processes, resources and outcomes. The aim was for a model that is continuous, consistent and relatively fast, with reduced delivery times that seek to avoid dispersion and focus all attention on specific task.

## 1.3. Main concepts

- Interaction between people before processes or tools
- Product operability before excessive documentation
- Collaboration with the client before contract negotiation
- Respond to a change before following a plan

## 1.4. Agile Principles

| Agile Principles | Description |
|---|---|
| 1) Satisfy the costumer through early and continuous delivery | Thanks to frequent deliveries and in less time, costumers receive value for which they are paying sooner and more often and, they can provide feedback |
| 2) Leverage change as a competitive advantage | Accept modifications in the requirements even in the last phases of a project. With that, the product meets the current needs of its users. |
| 3) Deliver value frequently | These smaller releases require less planning time and reduce the chances of errors in your development. Likewise, more deliveries translate into more and frequent feedback from the |

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| | client, preventing them from demanding major changes from the developers later. |
| 4) Cross-team cooperation | Break down barriers between the different teams of the project. Improving mutual understanding and collaboration; and achieve better results. |
| 5) Built projects around motivated individuals | Need to encourage members of the development team to feel motivated. Trust in the team. |
| 6) Face to face | Face to face communication is the most effective, as it significantly reduces response times and misunderstandings |
| 7) Product working as a measure of progress | Those actions that the development team carries out and do not affect the creation of a product that meets the client's demands, tell us little or nothing about the true progress of the project. If the product is not delivered to the costumer, the team has not progressed. It has not yet generated value for the costumer. |
| 8) Promote and maintain sustainable development | Seeks to optimize the way of working to avoid overloads and frequently deliver solutions to the market. Maintain a rhythm that can be followed by all of them, avoiding excessive tension or pressure. |
| 9) Technical excellence improves agility | Taking care of the technical aspects provides agility. |
| 10) Simplicity is key | Act as simply as possible. The client does not pay for the effort made, but because a solution that meets their needs is delivered. Dedicate the time and effort of the team to actions that really add value. |
| 11) Self-organized teams to generate more value | The teams that are given enough freedom and trust are the ones that achieve the best results. |
| 12) Reflection and frequent adjustments of the work of the team | Idea of continuous improvement. Teams must frequently review their work, to adjust it and improve their performance. |

*Table 1: Main agile principles*

# 2. Advantages and potential disadvantages

According to experts like Jesse S. Aronson, Alessandro Di Fiore, Kendra West and Andrea Segnalini; these are the main advantages and potential disadvantages of the agile methodology applied to any type of project.

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## 2.1. Advantages

1) **Quality Improvement:** Minimises errors in deliverables/ products/ outputs and improves the experience and functionality for the costumer.
2) **Increased Engagement:** Improves employee satisfaction and builds team awareness.
3) **Speed:** It shortens production cycles and minimizes reaction and decision-making times.
4) **Increased Productivity:** By better allocating resources, and in a more dynamic way, it improves production according to the priorities of the company.
5) **Greater Customer Satisfaction:** The costumer is more satisfied by being involved and committed throughout the entire development process. Through several demonstrations and deliveries, the client lives in real time the improvements introduced in the process.
6) **Use of Most Relevant Metrics:** The metrics used to estimate parameters such as time, cost, performance, etc. they are usually more real in agile projects than in a traditional one. Thanks to the division into small teams and phases we can be more aware of what is happening.
7) **Greater Control and Predictability:** The opportunity to review and adapt the products throughout the agile process allows all project members to exercise greater control over their work, which improves predictability in terms of time and costs.
8) **Cost Reduction:** Agile project management practically eliminates the possibility of absolute failure in the project, because errors are identified throughout development instead of waiting for the products to be finished and all the investment made.

## 2.2. Potential disadvantages

1. **Accurately determine the amount of time and money:** At the beginning of the project, it is difficult to determine precisely due to the constantly changing requirements.
2. **Uncontrolled expansion:** There is a danger that the lack of project boundaries will lead to uncontrolled expansion.
3. **Teams easily diverted due to lack of processes: the nature of the agile methodologies** of constant change **allows teams to be easily diverted. Often when proceeding without sufficient documentation or without a clear vision of what the product or result will be like.**
4. **It may be difficult to maintain the level of collaboration:** It depends on everyone involved in the project, including costumers, fully committing.
5. **Lack of documentation:** The project files are not collected so much and there may be a lack of documentation of them, as the solutions are only proposed to be carried out.
6. **Burn Out Syndrome:** Working with agile methods can increase the stress of some workers.
7. **Increased risk:** It can happen that the pace of work and the enthusiasm for the achievements made lose the risk aversion needed in any project.

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# 3. Methodological bases of the application of the agile methodology in non-IT projects

## 3.1. Functioning in the work environment

Before this methodology, companies developed projects linearly (or in a cascade) with a high risk of not adapting to the client's final demand. When this happened, they opted for emergency solutions, or even start the projects from scratch.

The main characteristic of the methodology is to make fast and continuous deliveries. Projects are divided into small parts that must be completed and delivered in short deadlines, called SPRINTS. The main advantage of this is that if it is necessary to make any modifications, changes are only made to the part involved and in a very short time.

Another very important feature is the use of multidisciplinary teams that work together throughout the process. For example, the person in charge of "marketing" can give "feedback" on how the final product is turning out to the technician who is performing a specific task. In this way (along with much faster deliveries) the final product is exactly what the market is demanding.

Agile teams carry out daily sessions, called DAILYS, which serve so that all team members know where each one is working and are aware of how they can collaborate so that the project continues to advance. In these meetings, each member must explain three principal things:

- **What tasks have you completed?**
- **What are the next steps to take?**
- **If they exist, point out the impediments that have prevented progress.**

## 3.2. Most used agile methodologies

### 3.2.1. SCRUM

Method indicated to solve complex problems and is based on empirical control processes. It means, decisions are made based on existing information and experience. It has two types of approach:

- **Iterative:** In each SPRINT a new vision of the product is generated that improves the version of the previous sprint. The properties of the product are refined and improved as the project progresses.
- **Incremental:** In each short period of time new features are added to the product.

On the one hand, some of the elements of this method are: assigned times, definition of done, Scrum cycle, products and different types of meeting. On the other hand, three roles are distinguished: Product Owner, Scrum Master and the development team.

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### 3.2.2. XP (Exclusive for software development)

This acronym comes from Extreme Programming, and it is based on frequent change and iterations relative to short periods of time. In this method four roles are established: agile leader or coach, client, programmer and tester. Regarding its values: simplicity, communication, feedback, motivation and respect as its main premises.

In all this context, 11 different engineering practices are considered:

- **Compact equipment**
- **Baking games**
- **User tests**
- **Small deliveries**
- **Simple design**
- **Pair programming**
- **Continuous integration**
- **Collective ownership of the code**
- **Coding standards**
- **System metaphor**
- **Sustainable pace**

### 3.2.3. KANBAN

The methodology consists of organizing daily work based on a task panel. It is designed to avoid overproduction and to ensure that components are passed from one thread to the next in the proper order.

A refill system is developed that controls the quantities produces to replenish components only when needed. Of course, instead of using specific Kanban, other reusable systems can also be implemented, such as containers, pallets or coded bands.

An alternative is anticipated production based on predictions.

### 3.2.4. LEAN

Philosophy based on maximizing costumer value and minimizing waste. In “pull” manufacturing processes, it lies in producing only what is necessary and at the right time.

Lean Start Up consists of extending the methodology to the launch of new companies on the market. The idea is to continuously validate each learning, experimenting with new ideas in the real business and iterating on this operating style.

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As a final comment à on these 4 methods, you do not always have to opt for one or the other, they can be combined with each other.

# 4. Concrete applications of the agile methodology in non-IT projects

In the final section, some examples will be shown as success stories, and good practices of the methodology in projects that are not in IT and software development.

## 4.1. Financial sector

According to the 2019 Study of IT Services Outsourcing by the Quint technology consultancy, the use of agile methodologies in the financial sector worldwide is about 66% and there is also a 32% intention to start using it in the short term. According to these figures, the growth of this form of work is very significant compared to 2018, with an increase of a 22% for the banking and insurance sector.

This is related to the growing digitization of the sector, which has experienced the need for a rapid migration of its services and products to digital media, for which agile methodologies make rapid and functional development possible.

In addition, because of the COVID-19 pandemic, the digital transformation of banking accelerated exponentially, as this situation demonstrated the importance of digital media for the continuity of the sector's operations and has forced financial institutions to rapidly digitalize to guarantee its continuity in the market.

So, adopting an agile methodology that structures a rapid digital transformation within a financial institution can become the factor that guarantees the success of this transformation and hence the growing popularity of agile methods in banking.

### 4.1.1. BBVA

BBVA's journey to become an "Agile" organization began in 2014. A transformation into a 100% digital organisation that continues to advance today.

The first step of the entity was to define the purpose: "Our purpose of making available to all the opportunities of this new era is reflected in our values. The costumer comes first. We are a team. Thinking big."

The adoption of the "agile" philosophy is helping to have clear priorities, aligning the forces of different areas, thinking locally and globally. And above all, it is enabling teams to collaborate seamlessly, put the costumer first, innovate, think big and add value globally.

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## 4.2. Textile Sector

The need to produce efficiently without causing disruption or delay in the delivery of a given product is an important factor.

Companies that want to remain active in a market like the current one, which requires quick responses, quality and quantity compliance, and short delivery times, require the implementation of more efficient production systems. Therefore, production systems have become a primary factor to implement in production plants.

Production systems to meet market demands do not require large investments in the implementation of computer systems. Currently, there are technological tools that can be adapted and automated to business models that involve production processes.

### 4.2.1. ZARA (Inditex)

Zara uses its resources four times more than most brands thanks to its agile system, so it isit is worth exploring what they do differently. Zara uses a technique called “postponement” which consists of postponing the creation, or even the shipment of products, as long as possible and taking into account their logistical record they are in a position to do so.

The products that Zara makes are hard to forecast; that is to say, they have a short life cycle and it is difficult to predict how or if the customers are going to like a product or not. Therefore, defining whether a thousand units or a million are needed is almost impossible. The solution that Zara has found is to make downward forecasts, if products start being scarce they start the wheel of creation and express delivery, which they already have established well and in less than 15 days they have the stock problem solved.

Zara’s logistics are so fast, reactive and flexible lies in the headquarters in Arteixo, Galicia. From there there is constant communication with all the stores in the world, which send information on what has sold the most and what the least on a daily basis. If a store asks for a consignment of clothing, it takes abouts 48 hours to receive it. First, they send the request to the central office, if it is approved, the factories are ready to start producing the garments, which, once finished are sent to the headquarters to pass a quality control and be forwarded to any part of the world. So, everything goes through Galicia, but also each team (order request, order reception, order manufacturing, shipping, quality control, etc.) relates to the rest and they communicate the status of the different life cycles of the product.

## 4.3. Technology Sector

While the application of project management is not new, new project management “approaches” or philosophies have led to significant improvements in the final quality of projects and in the overall management process itself.

Excel spreadsheet and reliance on Microsoft Office programs are not sufficient technology project management tools. It is vital to choose from a growing number of methodologies to manage complex

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projects successfully and within budget. All this offers the flexibility to make improvements that are outside the initial scope of the project, based on agile principles.

### 4.3.1. Apple

Apple is known as a pioneer company in being incredibly collaborative. There are no committees or working groups, instead, people are directly in charge of projects: one person oversees the iPhone operating system, another person oversees the mac hardware, another person is in charge of worldwide marketing, another in charge of operations and logistic, etc.

Apple is organised as a startup, the biggest startup in the world. Everyone gets together for 3 hours once a week and talks about what they're doing and how they're doing. Each person in charge knows what the others do, to take it into account in their own work, so there is a lot of teamwork between those in charge and that work is then filtered down, to pass the objectives to the rest of the work teams of the company.

### 4.3.2. Facebook (META)

When a new project is established, a team of about 6 or 7 people is assembled to carry it out, depending on the magnitude of the project. These people are chosen according to the skills needed to do the project, so on many occasions they come from different departments, with different backgrounds, etc.

Instead of coordinating the project through emails, chats or having a meeting per week to establish who does what, but everyone then goes to do it at their workstation, the entire team is gathered in a room, apart from the rest of the office, and they work there until the project is finished. They can also meet once or twice a week to dedicate the whole day to the project.

In that room they have all the necessary material and each one works on the part of the project in which they are experts. The fact of being all together allows them to speak and communicate directly, to be aware of the changes that are taking place in real time and to always keep in mind the work of the other colleagues, which in the end, is still the work of the rest of the team.

## 4.4. Construction Sector

The new technologies that are currently used during projects facilitate customer feedback and iteration from the design phase, modern simulation and virtual reality tools allow these iterations during the design process without adding costs to the project, which has "sped up" the decision-making process and contact with the client.

However, projects for the development of buildings or prefabricated elements are becoming more and more common, where a "zero unit" is built that will later be replicated in a manufacturing process of different units. In this type of project, the cost derived from the iterations during the design phase is less relevant as it affects a greater number of units, which makes it possible to use iterations or different prototypes as a design tool.

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### 4.4.1. Lean Construction

The Lean Construction philosophy seeks to add value to the client through optimized processes applying continuous improvement based on the following principles:

- **The client is the beginning:** And the end of everything. The Client, in general, wants a solution to a problem and the product or service must always be provided in the agreed conditions at the time he needs it, in the quantity he needs with the highest quality.
- **Continuous Improvement:** The assumption is that any process can be improved, as a whole and in its phases. This improvement, when it occurs repeatedly, benefits both the process and all the agents involved in it.
- **Continuous Flow:** The flow in the steps of the process must be continuous and uniform, complying with the deadlines, quantities, costs, and quality. Waiting times are a waste and a missed opportunity.
- **Value Generation:** The importance of focusing on the generation of value, thereby optimizing resources (space, time, capital, and professionals) and eliminating everything that does not add value. Or put another way by minimizing (or eliminating) waste.
- **Problem detection:** Work looking for perfection, detecting problems from their origin and providing solutions so that they do not repeat themselves.
- **Collaborative process:** Incorporate all agents, teams, suppliers, and subcontractors into the planning process, sharing information, risks, decisions and benefits.

# 5. Application of agile methods in R&D processes

## 5.1. Evolution of innovation process models

Innovation processes have been evolving from simple linear models to increasing complex interactive models. The first innovation process presented in the 1950s was generally perceived as a linear progression from scientific discovery, through technological development in companies, to the markets. The latest development in the 2000s is the systems integration and networking innovation process theory, and this highlights the need for continuous change. According to Dershin (2010), there has been a gradual shift from conceptualising innovation as a linear process understanding it as systemic or non-lineal.

Using sources like Modified from Rothwell (1994), Tidd et al. (2005) and Trott (2005); the table below has been made:

| Generation | Model | Features |
|---|---|---|
| First (1950/1960s) | Technology push | Simple linear sequential model; emphasis on R&D |

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|---|---|---|
| Second (1970s) | Market pull | Simple linear sequential model, emphasis on marketing |
| Third (1980s) | Coupling model | Integration of R&D and marketing |
| Fourth (1980/1990s) | Interactive model | Combinations of push and pull |
| Fifth (2000s) | Network model | Systems integration and extensive networking, continuous innovation |

*Table 2: Evolution of innovation process models*

In general, modern innovation processes involve activities that are essentially common to all companies:

1) **Searching:** scanning the internal and external environment for, and processing relevant signals about, threats and opportunities for change.
2) **Selecting:** deciding on the basis of a strategic view of how the enterprise can best develop, which of these signals to respond to.
3) **Implementing:** translating the potential in the trigger idea into something new and launching it in an internal or external market.
4) **Learning:** companies can learn from progressing through this cycle so that they can build their knowledge base and improve the ways in which the process is managed.

## 5.2. Similarities and differences between agile principles and R&D approaches

**Principle 1: "Satisfy the costumer through early and continuous delivery"**

R&D diverges from this in two regards: First, business value from R&D is often realized through subsequent development rather than through the R&D effort itself. The value of R&D may be intangible knowledge or proof-of-principle prototypes, and so there is less focus on early and incremental of value. In addition, the level of unknowns may be such that the project needs to start with an extended period of experimentation and prototyping. Lesson for Agile development: Understand up front what you do and do not know. Recognize that knowledge has value as well as working code.

**Principle 2: "Leverage change as a competitive advantage"**

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There is agreement between Agile and R&D on this principle, as both recognize that there are significant uncertainties at project outset.

### Principle 3: “Deliver value frequently”

Advancements in knowledge and capability do not necessarily happen on a regular schedule and so it can be difficult for research to be fit into sprints.

### Principle 4: “Cross-team cooperation”

This is an area of divergence. In R&D environments, teams are often composed of highly specialized experts who may operate in silos, unlike Agile's emphasis on continuous and cross-disciplinary team collaboration. This specialized nature can limit interactions between teams from different disciplines, which is counter to Agile’s approach of fostering multidisciplinary collaboration to quickly adapt to changing customer needs. In R&D, the focus is more on exploring new knowledge or technologies with collaboration occurring at specific stages rather than continuously. To align R&D more closely with Agile’s fourth principle, "Cross-team cooperation," it is beneficial to cultivate a culture that values communication across disciplines, sets common goals requiring collaborative efforts to achieve, and uses regular knowledge-sharing sessions and joint project reviews. This helps integrate different specializations within the project, aiming for a unified approach towards shared objectives.

### Principle 5: “Build projects around motivated individuals”

There is agreement between Agile and R&D on this principle. Researchers are typically highly motivated individuals and work best with considerable autonomy. (Sapienza, 1995).

### Principle 6: “Face to face”

There is agreement between Agile and R&D on this principle. While the definition of “face-to-face” has expanded over time to include web-conferencing, R&D thrives on dynamic exchange of ideas among members of a research team – though contemplative solo work time is also an important part of research. (Tidd, 2016).

### Principle 7: “Product working as a measure of progress”

In basic research, demonstrable product may not be appropriate or may take the form of executed experiments, though the experiments may not be successful. In applied research and beyond, successful experiments, prototypes, and other product come into play as measures of progress. Still, the non-linear and knowledge-based nature of R&D means that an accretion of working product is not always an appropriate indicator of progress.

### Principle 8: “Promote and maintain sustainable development”

In R&D environments, maintaining a sustainable pace of work, as advocated by Agile's eighth principle, "Promote and maintain sustainable development," presents unique challenges. Unlike Agile, which promotes a consistent and manageable work rhythm to avoid burnout and maintain productivity, R&D can experience fluctuating workloads with intense research periods followed by less intensive analysis phases. To adapt Agile’s sustainable development to R&D, it is crucial to establish clear expectations for work and recovery times, ensuring researchers have periods to recharge after intense efforts. Additionally, fostering a workplace culture that prioritizes the well-being and health of researchers,

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along with the quality of work over quantity, aligns R&D efforts more closely with Agile's sustainable practices. This approach helps manage the unpredictable cycles of innovation and workload in R&D, promoting a healthier, more productive environment.

**Principle 9: "Technical excellence improves agility"**

R&D product may take the form of a proof-of-principle or prototype which may be known a priori to be a throw-away or of limited lifespan. Thus, while the underlying research and development should be technically excellent, it may be sufficient for the product to be merely "good enough" to demonstrate the principle.

**Principle 10: "Simplicity is key"**

R&D often includes false starts as well as seemingly non-productive contemplative time. Thus, the total work done is almost always more than what would have been required if you had known the outcome at the outset. Minimizing the amount of work done is not always the right approach.

**Principle 11: "Self-organized teams to generate more value"**

There is agreement between Agile and R&D on this principle. Researchers work well with high autonomy.

**Principle 12: "Reflection and frequent adjustments of the work of the team"**

There is agreement between Agile and R&D on this principle. Researchers are creative people and can be great sources of ideas on how to do things better. Potential challenges include controlling the flow of ideas for improvement and mediating among competing ideas. (Badaway, 2010).

## 5.3. Potential strategy for implementing agile methodologies in R&D.

According to Ruly Weisbach (RND Director, HP), an expert that for the past 10 years have led six R&D business groups in a transition to agile, these are the principles he followed to make the transition.

➔ **Be productive, not efficient:**

Managers tend to give each developer one feature to work on. They justify this by claiming that it is more efficient than having several developers working on a handful of features. The result:

- A huge backlog in which all features are constantly in progress.
- A product manager who has no flexibility to change priorities, even if more important requests come in
- Features that take a long time to develop and are only ready (assuming they pass QA) toward the end of the release cycle.
- Resources such as QA, technical writers, dev, and ops, who are idle most of the time but become bottlenecks toward the end once all features and developed.

The right alternative: cherry-pick the most important features and stream them so the entire lifecycle workflow can consume them. This may seem inefficient, but it means that developers

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are available to help with QA, work on automation testing, do research, or even take courses to expand their horizons, rather than dispersing to other features that may create noise for those working on the important ones. Once those few important features have been thoroughly tested and fully documented and dev and ops are ready for upgrade, then they are truly “done”. That is what being productive with agile is all about.

➔ **Structure your R&D organization vertically, not horizontally:**

When an R&D organization is structured vertically as a group of feature teams, with each team responsible for a complete functional domain of the application, you can write or change code in all layers. You may have architects and other experts to govern critical areas and participate in design and code reviews, but the ultimate end-to-end responsibility is within the group. Expect some teams to resist this type of reorganization by claiming that it is more efficient to have the corresponding experts work on the back end, business logic, and UI. However, it is more important to be productive and allow a team to complete one feature from beginning to end.

➔ **Track features as well as user stories:**

The primary concern as a development manager is to deliver new functionality that provides value to the customers at least once every three months. To achieve that, is important to:

- Manage and track a feature's WIP to ensure that teams are not working on too many features at once
- Keep features focused and limited in scope
- Not let features get any bigger or more complicated than needed
- Track the quality of features
- Make commitments to the product managers regarding the resolution of features, they should be able to set priorities for features and track progress.

➔ **Plan short term, not long term:**

It is much more productive to implement only what is needed for the next delivery and refactor the code later if necessary. Even if a feature seems extremely important, it is less important than the features before it in the backlog. If it cannot be completed within the next two releases, there is no point talking about it until you break it down into smaller parts. Train the teams to think MVP, prioritize the backlog items from '1' to 'n,' and focus on what needs to be delivered in the next three months. This gives them a better understanding of the project's scope, and they will be more likely to stay focused on the functionality that is currently most important.

Below are a couple of examples managed by Ruly Weisbach himself applying some of the concepts mentioned above to two different companies:

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- A German chemical company adopted the agile principle of rapid iterations with early customer involvement in its R&D process. This new approach allowed it to increase its R&D productivity by 20% by either discontinuing projects or pivoting them in new directions early in the process. For example, thanks to early prototype testing with a small number of industrial detergent customers, the company decided to shelve research that would have otherwise resulted in a costly failure.

- PTC Therapeutics, a New Jersey–based biopharmaceutical company focused on discovering, developing, and commercializing rare-disease drugs. PTC faced the challenge of quadrupling the number of planned research and clinical development projects in 24 months due to its ballooning R&D investments and pipeline. It adopted a team-based structure to reduce inefficiencies and enable rapid scaling through empowered, cross-functional research, clinical development, and commercial groups. While this shift is still in progress, senior leaders are now more confident about smoothly managing greater complexity. Early results also suggest that the increase in productivity may be sufficient to manage twice as many programs, while also increasing the success rate of the projects.

# 6. Conclusion

The agile methodology offers a paradigm shift in project management, focusing on adaptability, collaboration, and continuous improvement. Rooted in the software development industry, agile has expanded its reach to various sectors, revolutionizing project execution across industries like finance, textile, technology, and construction.

The principles of agile, as outlined in the Agile Manifesto, emphasize customer satisfaction, embracing change, frequent delivery of value, cross-team collaboration, and sustainable development. These principles resonate with the evolving needs of modern businesses, where rapid response to change and customer-centricity are paramount for success.

Implementing agile methodologies in non-IT projects requires a shift in mindset and organizational structure. By adopting vertical team structures, tracking features alongside user stories, and planning short-term iterations, organizations can enhance productivity and adaptability. Success stories from companies like BBVA, Zara, Apple, and PTC Therapeutics demonstrate the transformative impact of agile methodologies across diverse sectors.

Furthermore, the integration of agile principles with research and development processes presents both challenges and opportunities. While certain principles align well with R&D approaches, such as leveraging change and promoting self-organized teams, others require adaptation due to the inherent uncertainties and longer time horizons of research projects.

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Overall, the agile methodology offers a dynamic framework for project management, enabling organizations to navigate complexity, respond to change, and deliver value to customers efficiently. As businesses continue to evolve in an increasingly competitive landscape, embracing agile principles can provide a strategic advantage in driving innovation and achieving sustainable growth.

# Annex 1: Sources

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