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THESIS TITLE:

CHALLENGES AND SUCCESS FACTORS IN THE AGILE TRANSFORMATION JOURNEY: A CASE STUDY

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I extend my deepest gratitude to my mother, whose support and encouragement were instrumental in my pursuit of this Master's program. Her belief in my abilities and her unwavering support have been my guiding lights and have made this journey possible.

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ABSTRACT

In today's fast-paced world, companies must keep up with the changes to maintain their position in the market. While traditional companies struggle to keep up, Agile organizations adapt to changes much faster. This thesis discusses the challenges companies face on their journey towards becoming Agile and how to overcome them successfully. An in-depth study was conducted on a pump company to understand how Scrum and Kanban frameworks, a continuous improvement department, and digitalization can help companies become more Agile.

KEYWORDS

Case Study; Agile; Agile Journey; Leadership; Structure; Scrum; Vision; Continuous Improvement

INTRODUCTION

The world is changing very rapidly today. Companies that can keep up with the pace of this change can maintain their place in the market. But while traditional organizations have difficulty in keeping up with this pace, Agile organizations can adapt to this process more quickly. While traditional organizations are built around a static, siloed, structural hierarchy, Agile organizations are characterized as a network of teams operating in rapid cycles of learning and decision-making. (McKinsey & Company, 2019), Many companies around the world are trying to become Agile organizations, but becoming an Agile company is not an easy process. There are many obstacles and challenges. In most companies, when the challenges in this Agile journey process are not properly identified, the likelihood of failure in the Agile journey process increases.

Companies that will start Agile transformations need to work effectively in certain areas. These areas range from employee motivation, reward system, management style, organizational structure, ... and many more. Stakeholders should not be the only focus for companies that want to maintain market dominance or gain a share in the market. A company must first have a goal and a vision. Then a strategy can be formulated. In the next step, the Agile journey process will begin strategically. In this journey, where slow and decisive steps should be taken, this study has been examined as a manual for companies.

The purpose of this study is to examine how the challenges faced by large manufacturing companies in their Agile transformation journeys are different from the challenges faced by software companies, and after identifying the challenges, how these challenges can be overcome and recommendations are made for companies.

The company to be examined in the Agile journey is a pump company. The company has started to use Scrum and Kanban Frameworks. At the same time, as a company that attaches importance to digitization, some developments and innovations can be examined in many areas. The company has defined a strategy and has a clear vision and business goals in line with this strategy. A very prepared Agile Transformation process has been initiated.

Scrum is a framework where people can tackle complex adaptive problems and at the same time deliver products with the highest possible value productively and creatively. Scrum practices are ongoing in the mentioned company. At the same time, many different topics such as project development, sustainability, Agile human resources, etc. have been examined in the company.

In the study, firstly the most important points in the Agile journey of the companies are explained and then the challenges that can be experienced in this process are explained. The challenges are grouped and solutions are found for each of them. In this study, the challenges are grouped under 5 different headings. There are three measurement methods used in research. The first one interview with managers, the second one is an online

survey through which the evaluations of employees, Project Managers, Business Managers, Digital Transformation directors, and senior management working in different departments, and researcher observations are taken. A qualitative analysis was conducted and the results were used to identify the challenges.

CHAPTER 1

AGILE METHODOLOGY

1.1 WHAT IS AGILE?

Agile is an idea that originated in the 1970s. It is a methodology that was developed to overcome the flaws in the traditionally applied methodology. Dr. William Royce wrote an article about the traditional method. (Royce, 1970) Royce emphasized that a project can be developed like a product on an assembly line. Thanks to this perspective, he said that before each improvement in the product, the improvement to be made should be determined. This is considered to be the most logical and effective method to use in software and manufacturing. This research by William Royce started an era. He brought a whole new perspective to the project management process in software and manufacturing.

Compared to traditional project approaches, the Agile method, which emphasizes specific project management in product development, responds to the problems that will be encountered during the development process. In this method, incremental and iterative sequences are often used.

Generally, Agile methods do not have processes like traditional methods. In these methods, incentive project management models are applied in processes such as compliance processes and audit processes.

Its functions aim to quickly understand and coordinate customers' needs. The reason why Agile project management is so well accepted is that it moves many projects towards success. It can also be quickly adapted to many product and software development projects.

1.2 THE AGILE MANIFESTO

The Agile Manifesto was created on February 11-13, 2001 in the Wasatch Mountains of Utah by 17 people. Representatives from Extreme Programming, SCRUM, DSDM, Adaptive Software Development, Crystal, Feature-Driven Development, Pragmatic Programming, and others sympathetic to the need for an alternative to documentation-driven, heavyweight software development processes convened (Agilemanifesto.org).

The Manifesto, launched on 11-13 February 2001, has 4 main points.

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

The Agile Manifesto is based on 12 principles. These are set out below. (Agilemanifesto.org)

1. ***Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.***
2. ***Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.***
3. ***Deliver working software frequently, from a couple of weeks to a couple of months, with a preference for a shorter timescale.***
4. ***Business people and developers must work together daily throughout the project.***
5. ***Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.***
6. ***The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.***
7. ***Working software is the primary measure of progress.***
8. ***Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.***
9. ***Continuous attention to technical excellence and good design enhances agility.***
10. ***Simplicity--the art of maximizing the amount of work not done--is essential.***
11. ***The best architectures, requirements, and designs emerge from self-organizing teams.***
12. ***At regular intervals, the team reflects on how to become more effective then tunes and adjusts its behavior accordingly.***

After this manifestation, there are situations where business firms work in more detail and have expectations. Some of these expectations are, continuous value creation, not projects with long output such as the waterfall method, but producing small cycle products that are fast and customer-valuable, developing a project framework that can respond quickly based on feedback, reducing error, increasing employee motivation, create a continuous learning environment, increasing employee quality of life, keeping up with developments in the world, a sustainable and stable work tempo, ability to respond to dynamic market changes, constantly increasing work efficiency (Dikert et al., 2016).

1.3 AGILE IN LARGE-SCALE COMPANIES

Schwaber (Schwaber et al., 2007) explain that the use of the Agile methodology provides significant benefits in a wide range of areas for medium, and large companies. There are many who share this view. These include reduced time to market, improved quality, reduced waste, better predictability, and better morale (Dikert et al., 2016). In addition to these benefits, Leonor Barroca et al. (2019) identified the top three motivations for companies to use Agile as *'improve business/IT alignment '*, *'enhance the ability to manage to change priorities '*, and *'accelerate software/product delivery '*.

Although the use of the Agile Method is known to have many benefits for companies, implementing this method requires a professional effort and a high level of dedication. This dedication should be made by different departments, both by management and by employees. There are many frameworks of Agile methods for support. Scrum, XP, and their combinations are by far the most widely used Agile methods .

It is known that companies cannot benefit much from Agile methodology if they do not start with a plan companies that try to implement Agile methodology without a vision may fail or face many obstacles.

In their research, Dikert et al (2016) stated some of the challenges experienced in the Agile journey in the companies they worked with as a case study as follows; '*Change resistance', 'Lack of investment', 'Misunderstanding of Agile concepts', 'Coordination challenges in the multi-team environment '* and many more.

Challenges related to organizational culture, resistance to change, and lack of support and skills remain an issue. '*Inconsistencies in processes' and practices* are the most important of these challenges.

Although different studies in the past have identified certain problems in the transition to Agile, it is a fact that new challenges have emerged due to the rapid change in the market, geographical problems, and Covid Related. In these situations, responsible person need to create research that will provide solutions. In this study, an effort has been made to

identify the challenges that have emerged as a result of the work done in the company, compare them with the general challenges, and suggest solutions to these problems.

1.4 TRADITIONAL PROJECT MANAGEMENT

Traditional project management is a distinct method of project development in which projects are executed in a sequential cycle: initiation, planning, execution, monitoring, and closure. The traditional approach emphasizes linear processes, documentation, planning, clarity of objectives, prioritization, and control. According to the traditional method, time and budget are variable and requirements are fixed, so it often encounters budget and schedule problems. In this methodology, time and budget are not clear. It is possible to set a deadline/project duration before the project, and it is also possible to calculate the budget to be spent on the necessary steps during this time, but in the waterfall, traditional methods do not add new challenges or requirements to be faced in the later stages of the project. Therefore, even if the objectives and customer needs are clear, the budget and time are often underestimated.

1.4.1 WATERFALL METHODOLOGY

When we talk about traditional product development, we can use many methodologies. The most widely used of these is the *'Waterfall Methodology*'. The waterfall methodology consists of certain steps and these steps follow each other. As shown in Figure 1, there are six steps: '*Analyze', 'Design', 'Development', 'Testing', 'Implementation',* and *'Maintenance'*. Although there are different formations, this is the generally accepted approach.

What makes this approach unsuccessful is the lack of a regular feedback network and the inability to respond quickly to problems. By the time the product reaches the end customer, it is already finalized, so if the end customer doesn't like the product, a lot of work will have been wasted. Agile methodologies such as Scrum and Kanban are designed and focused to eliminate these mistakes.

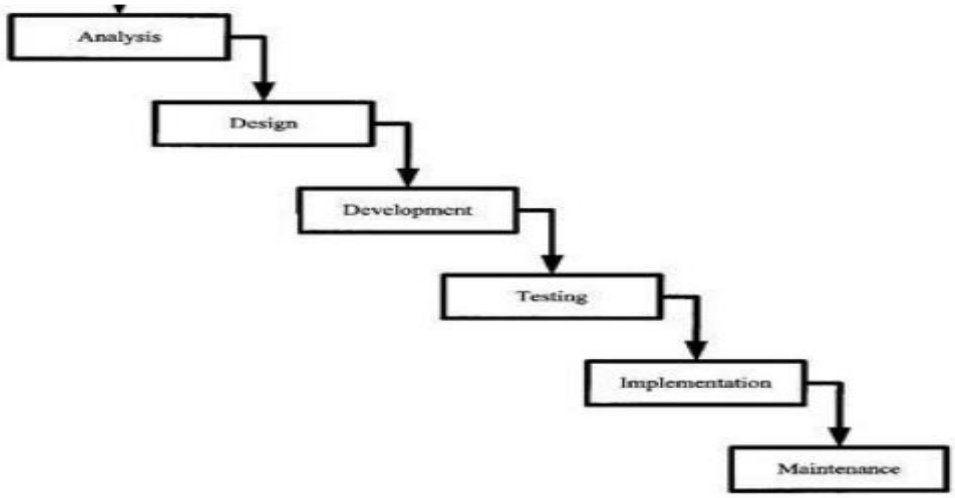

Figure 1. Waterfall Methodology Steps (Eason, 2016)

1.4.2 AGILE VERSUS WATERFALL

Agile and waterfall are two completely different methodologies. Both aim to bring a project to its final form. Agile is an iterative methodology. The waterfall is a sequential methodology and tasks progress in a linear formation. In Agile, on the other hand, there are various actions at each step to get feedback and solve problems. In Agile methodology, first, the backlog of the product to be made is clarified and then the first part is developed, then feedback and review are received for the developed part, its suitability is checked and another task from the backlog is included in the process to be produced. In Agile methodology, mistakes are eliminated quickly because there is constant communication and evaluation, but in Waterfall methodology, because it is a sequential system, mistakes are usually noticed towards the end of the project. This prevents companies from developing products at the desired quality, speed, and budget.

In Figure 2, the Standish Group CHOAS report (2015) considers 10,000 different project development processes and compares Agile and Waterfall projects. It is clear that projects developed with Agile have fewer failures and a significantly higher success rate.

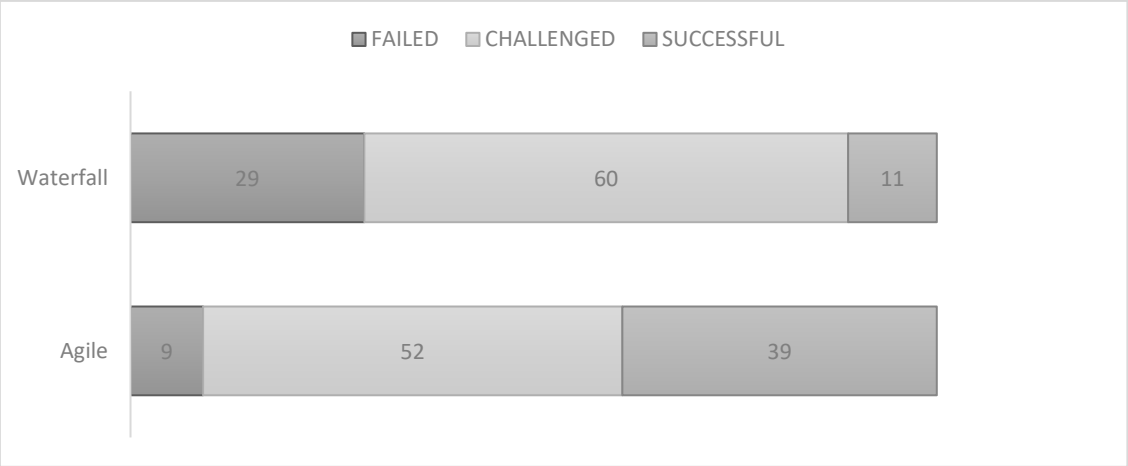

Figure 2. Chaos Resolution By Agile Versus Waterfall (The CHAOS Report, 2015)

1.4.3 SCRUM

Scrum was developed by Ken Schwaber and Jeff Sutherland in the early 1990s and its basic ideas were introduced by Schwaber (Schwaber, 2004).

Scrum is not a methodology. Scrum is a framework. Scrum implements the scientific method of empiricism. Scrum replaces a programmed algorithmic approach with a heuristic one, with respect for people and self-organization to deal with unpredictability and solve complex problems.

The fundamental unit of Scrum is a small team of people, a Scrum Team. The Scrum Team consists of one Scrum Master, one Product Owner, and Developers. Within a Scrum Team, there are no sub-teams or hierarchies. It is a cohesive unit of professionals focused on one objective at a time, the Product Goal. (Scrum.org)

The Product Owner is accountable for maximizing the value of the product resulting from the work of the Scrum Team. (Scrum Guild, 2020) It defines the work to be done, the definition of done, and creates a backlog. The Scrum Master is accountable for the Scrum Team's effectiveness. They do this by enabling the Scrum Team to improve its practices, within the Scrum framework. (Scrum Guild, 2020) Team members are the people in the Scrum Team who are committed to creating any aspect of a usable Increment each Sprint (Scrum Guild, 2020).

There are 5 Events in the Sprint. *The Sprint* is a period of 2 to 4 weeks. The tasks added to the sprint in the planning are completed during the specified sprint period. *Daily Scrum Meetings* are 15-minute meetings that bring the team together every day (during the Sprint). What has been done and what will be done are discussed. *Sprint Planning* initiates the Sprint by laying out the work to be performed for the Sprint. This resulting plan is created by the collaborative work of the entire Scrum Team. (Scrum Guild, 2020) *Sprint Review* is a time-boxed meeting (max. 4 hours for a 1-month sprint) held at the end of the sprint. The main purpose of the Review is to determine the value produced during the sprint and to update the Product Backlog accordingly. While the sprint review meeting

focuses on the product, the *Scrum Retrospective* meeting focuses on the process, i.e. how the scrum team worked together.

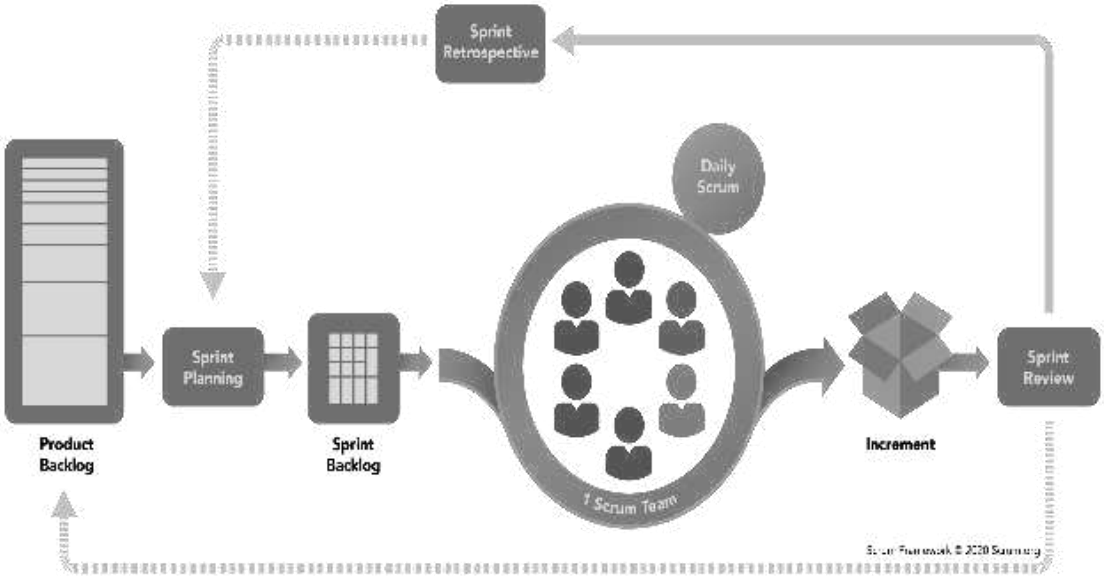

Figure 3. Scrum Framework (Scrum.org, 2020)

Scrum Artifacts represent the definition of done or value produced to provide transparency as well as opportunities for observation and adaptation. These artifacts are designed to maximize the transparency of key information so that everyone can understand the same thing from the artifact.

1.4.4 KANBAN

The word Kanban is Japanese and means "Visual Board". This definition originated in the 1950s. Kanban was developed by Taiichi Ohno to improve Toyota's production efficiency. Kanban is an approach used to control material movement in a just-in-time production environment. It helps you to visualize the project being developed and helps to establish a mental model in the team, as well as maximize efficiency and continuous improvement through visualization of the work done and the Kanban board.

Kanban has two main principles. These are; Change Management Principles and Service Delivery Principles. As shown in Table 1, there are three practices under each of these main headings.

Table 1 outlines the core principles of Kanban, divided into Change Management Principles and Service Delivery Principles. The Change Management Principles include: starting with current processes, pursuing incremental, evolutionary changes, and encouraging leadership at all levels. The Service Delivery Principles focus on meeting customer needs and expectations, managing the work rather than the workforce, and regularly reviewing the service network. These principles collectively enhance efficiency

and responsiveness in project management and workflow improvement within an agile framework.

Change Management Principles	Service Delivery Principles
Start With What You Do Now	Focus on Customer's Needs and Expectations
Agree to Pursue Incremental, Evolutionary Change	Manage the Work, Not the Workers
Encourage Acts of Leadership at All Levels	Regularly Review the Network of Services

Table 1. Principles Of Kanban

1.5 AGILE TRANSFORMATION

Agile transformation enhances collaboration among teams, creating a more harmonious working environment, which is highly sought after by companies today. Through this process, products or services can be delivered to customers faster, cheaper, and with fewer errors. Consequently, customer satisfaction increases, and teams align better with the overall goals and objectives of the organization. Additionally, agile transformation strengthens the ability to adapt to changes in market or industry conditions, thus providing companies with a competitive advantage and opportunities for continuous improvement.

Some benefits :

- *Improved collaboration among team members*
- *Faster delivery of products or services to customers*

- *Increased customer satisfaction*
- *Better alignment of teams with the overall goals and objectives of the organization*
- *Enhanced ability to adapt to changing market or industry conditions*

Some of the companies that have been pioneers in Agile transformation include Google, Amazon, and Apple. These companies have all embraced Agile values and principles in their development processes, and have seen significant improvements in their ability to deliver high-quality products and services to their customers.

CHAPTER 2

AGILE TRANSFORMATION :

LITERATURE REVIEW

This chapter discusses the problems commonly experienced by companies that have already made the decision to undertake Agile Transformation. In this section the most common areas are examined in the literature and in Chapter 3, which is more detailed to understand the groupings and areas, the issues and challenges that companies are most likely to face are discussed. The interconnections in this process and how challenges in Agile processes are in fact linked to other challenges are described.

2.1 GENERAL CHALLENGES

In this century, change is inevitable and the pace of change is faster than ever. This is due to the increasing number of organizations and competition in the business world, and companies are turning to Agile transformation processes. The primary goal of Agile transformation is to increase their power in the market and to be more flexible and adaptable to rapid change. However, entering this transformation process and taking this decision brings with it many challenges. Agile, a new methodology, has a more difficult

adaptation process than it seems. There will be many challenges as companies try to transition from traditional, hierarchical business models to more dynamic and flexible methodologies. To be successful in these implementations, companies need to overcome these challenges step by step. While many companies accept that this methodology is a necessity for success, in real life the trade-offs involved in implementing this methodology are more difficult to resist than expected.

In this chapter, we will discuss the main challenges that are generally recognized in the literature and the challenges that firms may face and that have been previously recognized as common in the literature.

The concept of Agile emerged in 2001, as outlined in Chapter 1. 23 years ago, 17 software developers came together to create the Agile Manifesto, and although it was published 23 years ago, we can consider it a newer methodology. The adoption of this innovative approach, especially in the technology and software development sector, and its subsequent adoption in other sectors has brought many challenges. There will be a significant difference between adapting this work with thousands of people in a production area and a 10-person startup company. However, regardless of the size of the company and the work being done, if we start with the challenges that small, medium, and large enterprises will face in common, we should first address the issue of training and skills development.

Training and skills development is one of the cornerstones of Agile transformation and an area that requires mandatory attention, regardless of the size or sector of the company.

It is necessary to provide the deep knowledge and understanding required for the successful implementation of this methodology. The adoption and use of Agile methodologies in companies require not only technical and professional skills but also a set of skills such as team dynamics, customer interaction, internal interaction, continuous adaptation, leadership, and safety psychology in the work environment.

Therefore, when the senior management takes the Agile transformation process through the board and Agile is chosen as the new strategic decision, the senior management needs to take action to teach this methodology to their employees. Not only software developers but also different employees from all aspects of the company should be trained and adopt this methodology. Employees at all organizational levels are vital in this process. This is because the Agile approach actually means a fundamental change in how work is done.
In today's market, there is a plethora of training and certification programs available for Agile transformation. For example, there are numerous educational options designed specifically for Scrum, Kanban, and Lean, among other Agile methodologies. However, companies should not limit themselves to merely providing certification assistance and theoretical training. Beyond this, it is crucial to afford individuals and employees the opportunity to understand how these methodologies are applied in practice.

While the development of talent and skills is fundamental to this process, the involvement of senior executives as described above is just as important. This is where the other issue of 'Leadership and Management Support' comes into play. Previous research has emphasized the contribution of senior management and the importance of leadership in this process. Leadership is in fact a catalyst for the sustainability and adoption of Agile

methodologies, as well as a catalyst for employee enthusiasm and motivation. The support of senior and middle management is not just approval. Managers need to be actively involved in this process, taking a leading role in changing the political order. Leaders are responsible for creating a healthy environment that embraces this change and encourages trial and error and, in fact, the start of regular cycles, as well as continuous learning and feedback processes. Senior and middle management's commitment to Agile must be very clear and transparent. If there is a fear of loss of power in the executives and they cannot show their commitment to the process, the employees will not be able to show the necessary commitment to the process.

The contribution, commitment, and support of the leadership and senior executives will be essential for a successful transformation in order to ensure that the necessary training is received at all levels of the company and that the necessary financing for these training is provided first and foremost, and then the training and methodologies are implemented.

After emphasizing the critical role of leadership and management support in Agile transformation, we can talk about another important element in this process, communication and collaboration.

When we talk about communication and collaboration, managers assume that it is very simple and that there is open communication in every company. But the situation is actually different than that. In many companies, people do not communicate properly or are afraid to voice their problems. In fact, Communication and Collaboration is one of the most important issues for the success of companies. Agile methodologies are based on

continuous open and transparent communication. It requires close cooperation, solidarity, and a healthy relationship between teams and even within the entire organization. This kind of relationship first and foremost increases the motivation of individuals to work, but also requires that the most valuable ideas are supported and implemented in healthy debate, rather than being accepted without discussion.

However, in less cooperative and poorly communicative firms, these discussions are often intimidating for lower-level employees. One of the most important points here is for senior management to create an environment for their employees to adapt to this open communication to the best of their ability. The current organizational culture means that teams are often intra-departmental and do not have frequent and continuous communication with other departments. There are two main differences here: in software development and startups, communication is better than in large manufacturing companies because of the small number of people and the nature of the work, but in large corporations, it is more complex. Generally, due to lack of communication and lack of clear and transparent documentation, people may do demotivating and time-consuming work such as job repetition. This is why proper communication is critical for a successful Agile transformation.

The reason why this critical change cannot be implemented so easily is that people who have worked for a long time in the current system based on the age difference do not find this change logical and do not support the cultural change as well as the change in the organizational structure. Here we need to talk about the fourth topic. Cultural Resistance and Organizational Change are of crucial importance for companies entering the Agile

transformation path. Improving communication and collaboration is not only a technical process but also requires a profound cultural transformation, a profound and fundamental change in the way individuals and groups within the organization react to certain situations, in their behavior, in their attitudes to business processes, and in the way they work.

Cultural resistance can be defined as the reluctance of employees to adapt to new methods and ways of doing business to the constantly and rapidly evolving technology in the developing world, or the reluctance to give up their current power.

The adoption of Agile methodologies, especially in large companies where traditional management structures and the current way of doing things are established as a habit, actually means a huge change and it would be a big mistake to think that this change process will be short. Adapting everyone in the existing system step by step to this new system, recreating the workflow, and making it more Agile requires a serious strategy and a long time. This requires serious change management. Change management entails a systematic approach to adapting employees to new ways of doing business, technologies, and methodologies. In this process, employees and teams should be provided with a continuous and regular training and development environment, including training and development programs, mentoring, and coaching.

In this area, we need to address another recognized challenge in the literature, Continuous Learning. In all the topics mentioned above, we have talked about providing a regular change environment for employees, and in this regular change environment, regular

follow-up and training are essential for the positive outcome of these changes. In order for employees to continuously adapt to new methods, technologies, and methodologies, they need to embrace learning and development as a process, while at the same time, employers need to directly promote this way of thinking within the company.

In this process, it would be more beneficial to provide a continuous training environment with a personalized strategy rather than standard training for each department. In addition to this, the fact that individuals have an influence on the training path they will follow and that they follow a standardized path will increase the career development of the employees, their loyalty to the company, and their love for the company. The more a person develops in their work, and the better they start to do it, the better their work motivation will increase in direct proportion.

The common challenges in this area are lack of time and resources. The training, certifications, and cultural change activities mentioned in this process will be a serious financial burden for companies. This is why it is important to adopt a proper strategy before integrating Agile methodologies. While in small companies this will not be a big problem, in large companies using trial groups and expanding the groups with the feedback from these trial groups will be a good approach to overcome this challenge.

However, the second challenge in this process is that it is very difficult to measure or track the impact of continuous learning. It will be difficult for companies to calculate the value created by individuals in this process or ROI (Return of investment). For this reason,

companies will have to develop a process that fits their own strategies. There are different approaches in the literature to assess the value of the activities and training received.

After the challenge of measurement areas mentioned above, we can talk about the next challenge, Measuring Success and Continuous Improvement. Even after adopting continuous learning and making the necessary strategic decisions, there is actually a serious and challenging process that continues for companies. We can first examine this in two areas, the first challenge is the measurement of success. Measuring success is an objective criterion for companies. Having a measurable value can be used to calculate the efficiency of decisions made by companies, the success of processes, and the success or failure of Agile teams by using certain measurement techniques that are frequently found in the literature. For example, in "The Scrum Guide" written by Jeff Sutherland and Ken Schwaber and widely used in the Agile transformation process, there are various measurement tools used to track the success of scrum teams. Examples of these are the Sprint Burndown (2.2.1) chart and Velocity chart (2.2.2).

Another challenge recognized in the literature is for firms to adopt a culture of Continuous Improvement. Continuous Improvement is the most important factor for companies to adapt in a changing and evolving world. Companies that do not improve themselves or fail to catch up with new technologies and developments will unfortunately fall behind the industry. This will create a negative result for companies. Again, there are difficulties of culture change in this field. Employees or senior management may not want to change the way of doing business, but also their inability or unwillingness to use new

technologies is in the area of cultural resistance. Leaders need to play an active role in this area and establish open channels within the company to identify gaps.

To start with, employees need to be in a constant feedback loop with the aim of continuous improvement. But another challenge in this situation is that employees may be afraid to give feedback. First of all, leaders will need to create this safety environment for employees. Once the communication has been successful, the necessary training or changes can begin. Usually starting with a small test group and gradually expanding this group will make the process more controllable. Taking small steps will accelerate the rapid resolution and intervention of any problems that may arise. For those who continue to progress successfully, it is important to celebrate successes. Positive feedback will keep team motivation and individual motivation high.

2.1.1 SPRINT BURNDOWN GRAPH

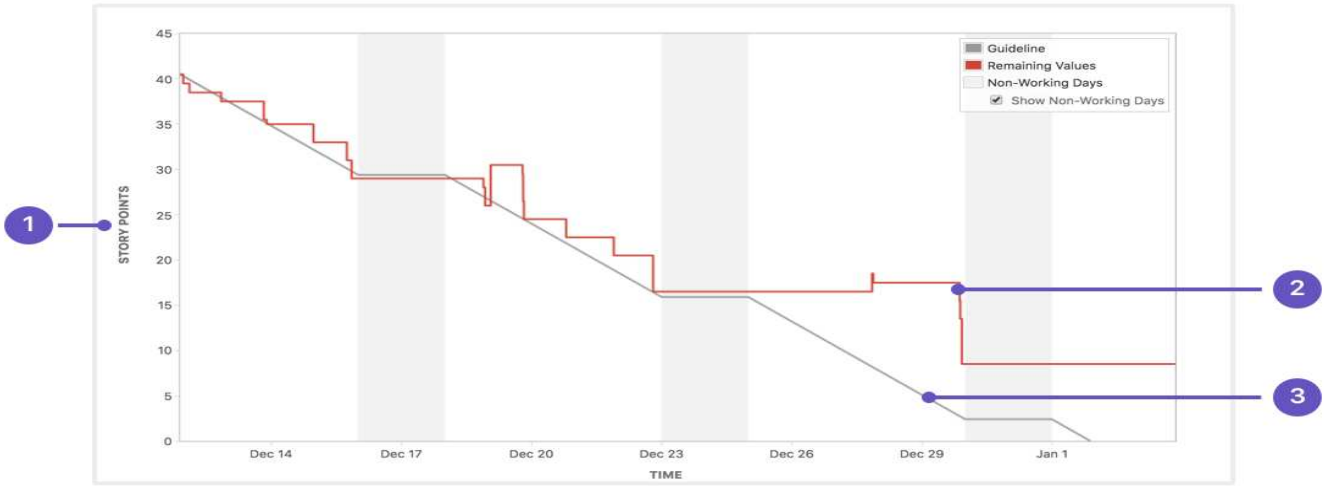

Figure 4. SPRINT BURNDOWN GRAPH Example From Jira Software(jira.com)

The Sprint Burndown chart is a tool used in Agility methodologies and visually shows how much of the work that needs to be completed during a sprint has been accomplished. Sprints are specific time intervals lasting a few weeks (2-4 weeks). During this time, Agile teams try to complete the goals and tasks they have set. The horizontal axis of the burndown chart usually shows the days, while the vertical axis shows the amount of work to be completed, where the story point is usually used as a benchmark. At the start of the sprint, the amount of work to be completed starts at the top, and teams try to burn down this chart by completing tasks.

This measurement tool is also useful for the team to track the progress of the work and the process. With some applications, it is possible to determine in advance whether the sprint will be completed successfully or not, and teams can take action accordingly. In addition, these graphs can be used in retrospective meetings and help to take steps for improvement.

In the chart shown above, (Figure 4) the field numbered one is usually the Story points field. The field numbered two is the Remaining values field. It shows us the amount of work remaining, which is shown in red. The number three is called Guideline. The gray line here shows an estimated process for the teams. If the red line is below this area, it is

a good indicator that the team will be able to complete the work within the specified time interval. In the case of full hang, the teams need to speed up their work.

2.2.2 VELOCITY CHART

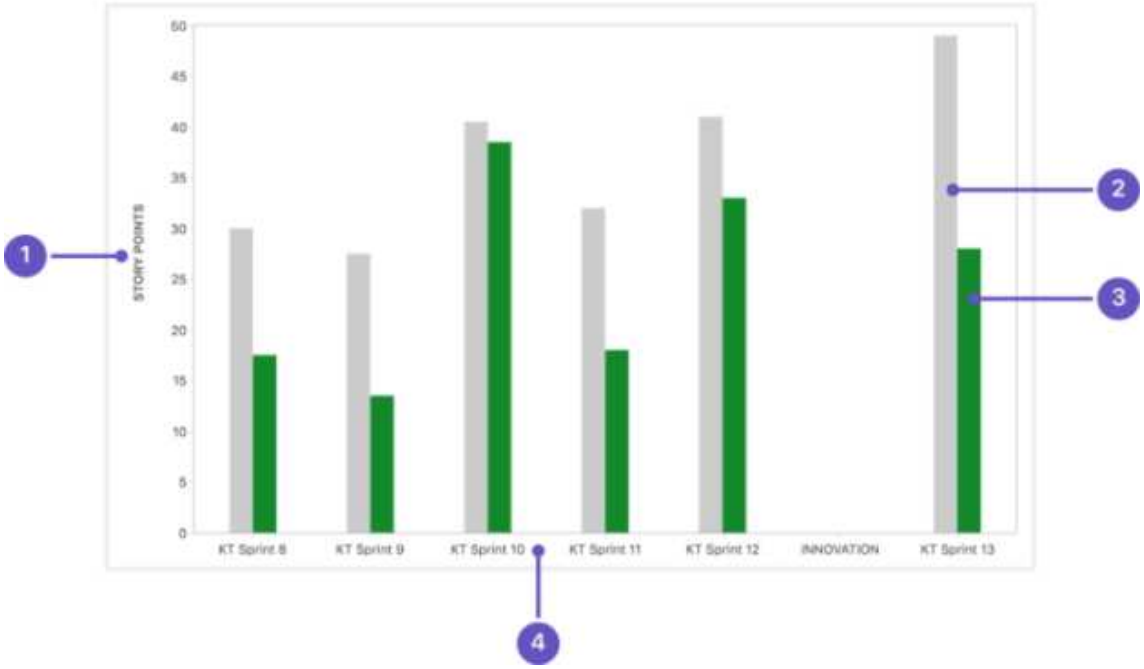

Figure 5. Velocity Chart Example From Jira Software (jira.com)

A velocity chart is, as the name suggests, a speed chart. It is used in Scrum and Agile methodologies to measure the performance of teams over a sprint or a period of time, i.e. the workload they can complete. This is a really useful tool for teams because it acts as a

little guide for teams on future projects. By knowing how productive they have been in one cycle, team members can estimate how much workload they need to take on for the next sprint. This helps to produce more efficient cycles. Preventing overloading will enable team members to work more proactively. It also provides the opportunity to communicate transparently.

An example of a Velocity chart is given in Figure 5 above. Here the area shown with number one are Story points. Number two is the commitment of the teams. The gray bar for each sprint shows the total estimate of all issues in the sprint when it starts. After the sprint has started, any stories added to the sprint, or any changes made to estimates, will not be included in this total. Field number three contains the points completed by the teams at the end of the sprint. Any scope changes made after the sprint started are included in this total. The field numbered 4 holds the number of sprints we are talking about.

2.2 CONCLUSION

As a result, it can point to the following 6 main areas as current problems. These six areas, which have been identified as general problems in the Agile transformation process, can be characterized as general problems, although they vary according to different company structures and sizes.

- *Cultural Resistance and Organizational Change*
- *Training and Skill Development*

- *Leadership and Management Support*
- *Communication and Collaboration*
- *Continuous Learning*
- *Measuring Success and Continuous Improvement*

In this study, we examine the challenges that a large-scale manufacturing company may face. What are the sub-areas of the 6 main challenges mentioned above or what are the different challenges that can be found in these areas have been investigated.

Larger companies engaged in manufacturing will need to spend much longer in this journey, and the extra challenges that will arise during this journey can be a general guide for different production companies. The fact that manufacturing is inherently more physical than software will pose a different set of challenges in Agile transformation.

CHAPTER 3

THE STUDY

In this section, the study and details of a manufacturing company on an Agile transformation journey are discussed. Through observation and interview methods at certain intervals, people who are actively involved in Agile Transformation within the company were interviewed and the findings are presented in this section. As a result of the study, challenge factors were identified and suggestions were made on how to address these issues.

3.1 STUDY DESIGN AND DATA COLLECTION

The measurement methodology for a project of this size is Qualitative. Interview and survey methods were used to collect this data and writer observations during the process. One of the most important parts of the process is to determine the questions to be asked. In this area, five main topics were selected for the preparation of the questions ;

- Method related
- Technology related

- Organization related
- Culture related
- Ability and Motivation (People) related

These dimensions, which have been used in a previous study (Reginaldo and Santos, 2020) , helped us to cover the whole general space.

Observations continued for a total of 12 months. In addition , writer made interviews with different members of senior management and white-collar employees.

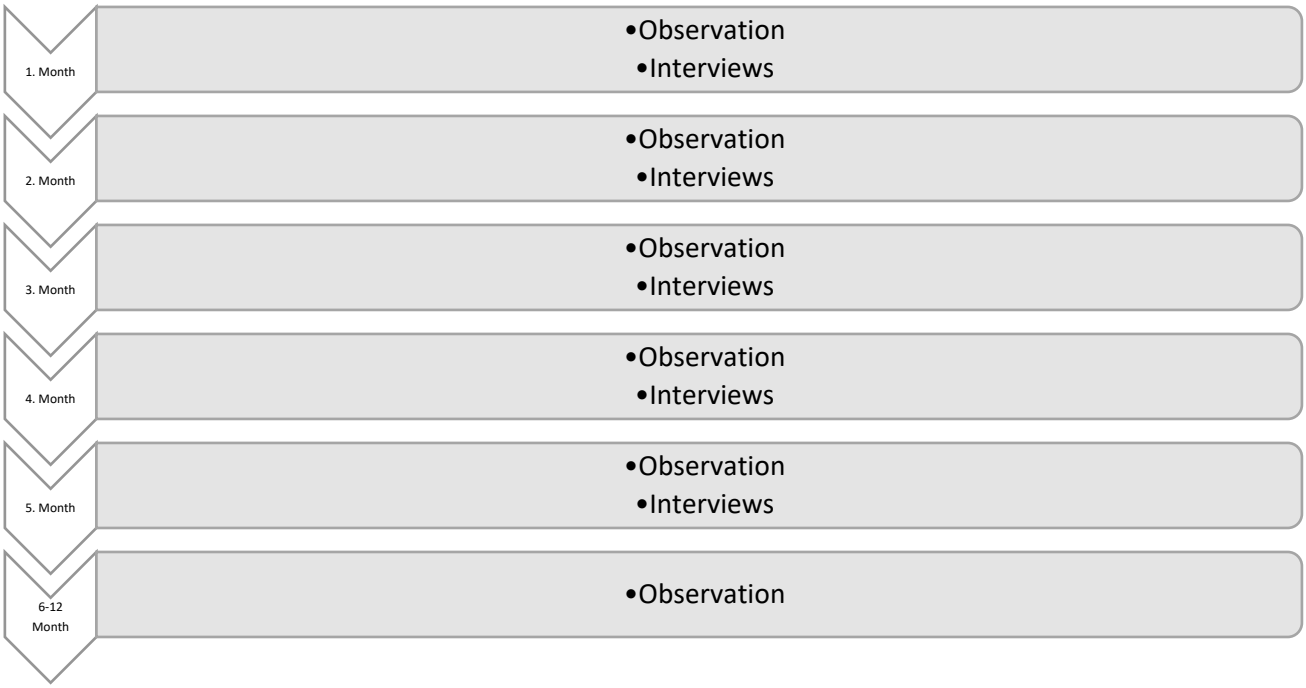

Figure 6. Data Collection Schedule

A schedule of the data collection actions to be carried out is shown in *Figure 6*.

In the questions asked in the interview, there will be a tendency to get information under 3 main headings. These can be named *'Mindset & Culture '*, *'Teams & Operations ',* and *'Strategy & Organization '*. Since there are many topics that can be observed in the Agile transformation journey, the topics have been prepared in this way with the broadest scope and a detailed scan will be possible thanks to the results found in the research in the old literature.

Finally, the results of the survey, shortening, and collation of the notes taken in the interview, observation, and the work done in the old literature will be brought together.

"In the tables presented in this section, findings from interviews and observations are indicated by the symbol 'x'. A greater number of 'x's represents a consensus among more individuals that this issue has a significant impact.

3.2 IDENTIFICATION OF CHALLENGES AND SUGGESTIONS

3.2.1 TECHNOLOGY RELATED

In this section, technology-related challenges were discussed, important points were identified in the interviews and these issues have been followed up. A total of 6 issues stand out in this issues. These issues are *Performance and Team Activity Tracking, Digitalization, The choice of software, Simplify Complexity, Making usage of tech faster and cheaper, and Connecting People - Smart working*. In this section, we will look at these issues in more detail and before that, an overview of the interviews is shown in the table below. The interview results are grouped in this way and the common issues of the interviews are identified. In the Observation column, the observations of the researcher in the company are indicated. Interview fields indicate the period of the interviews.

Technology Related	***Observation***	***Interview 1***	***Interview 2***	***Interview 3***
Performance and Team Activity Tracking	*x*	*xx*	*x*	*xxx*
Digitalization	*x*	*xxx*	*x*	*xx*
The choice of software		*x*		
Simplify complexity – one place for all	*x*	*x*		*xx*
Connecting People - Smart working	*x*	*xx*	*xx*	*xxx*

Table 2: Technology Related Issues

3.2.1.1 Performance and Team Activity Tracking

As a result of the study, the primary problem is that no other performance metrics other than those used in the Agile methodology can be identified. Nowadays Burndown chart and Velocity chart are common Scrum performance monitor graphs and provide us with information about the performance of the teams, but since the company we examined is not a software company and is a production company, the indicators of these charts do not provide a clear understanding of the performance of the team. Waiting for answers from suppliers, machine errors in production, rework and scraps handling, and human problems change the flow of these graphs. In the Scrum framework, User Stories are mentioned in *Chapter 1*. Each User Story is scored by the user who will complete that project. This scoring is preferred between 1-5 and 1-10. 1 is assigned for very simple and low-effort Stories, while the maximum score is assigned for very difficult and labor-intensive tasks. These scores determine the Burndown chart at the end of Sprint.

One particular problem in this area is that if the team starts to think that these charts are a measure of performance, they may create unnecessary User Stories or assign 10 points to a task that should be worth 1 point. This is actually contrary to the whole methodology, so it is important to communicate with the team and take the necessary precautions to

ensure that the Burndown chart and Velocity chart reflect the truth. These charts should not be used as the sole measure to determine whether the people on the team are doing their jobs well. Each member of the team should adopt a collective mindset and in this case, low or high scores on these charts in the Reviews should not deteriorate the performance or morale of the team. Stakeholders should then ensure the continuity of the project with more constructive criticism.

The possibility of a complete solution to this problem unfortunately does not exist in the production domain, but unlike in the software domain, in order to monitor team performance, the workload of individuals can be determined and they can be assigned to specific projects accordingly. In this case, we can give an example. One person can be on the team of more than one project, and in large companies, many strategic projects have to run concurrently. Due to the natural relationship of the production department with other departments, people in this department can be present in many different projects simultaneously. Here, instead of monitoring performance, tracking workload can be a solution. Putting an employee in more than one project simultaneously means taking away the time that we will allocate for that person to do the work. If we need to do a calculation, Daily Scrum Meetings last 15 minutes. Assuming that these meetings are held 5 times a week, 75 minutes a week is spent only with these meetings. Let's consider that the Review is held once a month and lasts 1 hour. If we assume that 1 hour is spent in Retrospective meetings and 2 hours are spent for Planning meetings every month, in total, approximately 315 minutes (5.25 hours) per person is spent on projects with 1 scrum framework. If a person is in 3 projects, it means that the employee spends 15.75 hours per month (10% of his working time), and if the employee is in 5 projects, it means that he

spends 26.25 hours (16% of his working time) only in meetings. Considering these, assigning a person to more than 3 concurrent projects significantly reduces the amount of time the employee has to spend on employee work. At the same time, there are project-related inter-team times that are not taken into account here.

Measuring an employee's performance, therefore, depends on many different parameters, and there are many reasons why employees may lose time that could be used to create value for projects. It would not be possible to calculate these in a large-scale manufacturing company.

When measuring performance, the employee's remaining time outside of meetings should be determined and a reasonable workload should be given. Under excessive workload, the employee's motivation may also decrease, as well as reflecting unfinished stories as finished in order to avoid bad reactions and over-scoring stories, and in fact, it may result in incorrect manipulation of the results of the graphs that provide us with a performance measure.

As a result, in order to improve performance, companies should not reduce employee motivation and belief in the Agile culture. It should be taken into account that this process is a long process that will take a long time to be adopted by companies culturally and this process should actually be handled with a people-oriented approach.

3.2.1.2 Digitalization

The study shows that , one of the most important things for companies that want to be Agile is the speed factor. Companies that adopt to be Agile and fast in the Agile transformation process can adapt this process more quickly and safely. The importance of the speed and follow-up opportunities provided by digitization in production, service, and internal communication is indisputable. First of all, all processes will be faster and if any new action needs to be taken due to this reason, this action will be understood more quickly. In addition, many internal and external areas can be analyzed with the data collected. The ability of the company to see its position in the market is actually an important basic component in the critical decisions it needs to make.

Apart from these, with the start of the AI era, companies that do not digitize will not be able to catch up with the competition in the market. The power of data and the importance of making decisions based on data is more important than ever. Analyzing and visualizing the data collected here and making critical strategic decisions based on them will give companies an edge in the Agile transformation process. One of the important points here is that companies should give special importance to AI and digitization and these areas should be examined under a main department, not as a side job. The speed of developments in this field is undeniably high and it is important that an active team follows the developments and adapts the existing system in the best way.

For the difficulties to be experienced in the digitization process, it will be more efficient for companies to take this path with a consultancy or in-house department if their budget

is sufficient. If there is no budget for this, it is necessary to start from small areas that can be applied and digitalize different processes of the company with small steps.

3.2.1.3 The choice of software

As with any process, there are many tools available today to make it easier to do a job the right way. There are many tools available today for Agile Transformation. However, it requires serious research to discover which of these tools are suitable for the company. The study shows that price and performance should be prioritized, and data security, user interface, and a tool that the company can customize according to its needs should be used. Even if many different software companies provide this service, making an investment outside the needs of the company and not using these applications will create a waiting situation in Agile Transformation. With a simple example, a board can be prepared for a Scrum project with post-its on a wall in the simplest way. However, when the size of the company increases, the number of simultaneous projects will increase, using posts for a company that carries 40 projects simultaneously will be contrary to the Agile Methodology and this situation needs to be digitized. Choosing the right application for the creation of Kanban and Scrum boards is very important here, you need to use an application that the whole team can easily use, where stories can be created quickly, and

which can be used quickly to maximize the efficiency of meeting times and provide you with specific results instantly.

Choosing the right application and gradually adapting it to Scrum teams will increase the efficiency of the time the team spends in meetings and reduce the loss of motivation.

3.2.1.4 Simplify Complexity

Another important topic in the study founded is reducing complexity for Agile Transformation, using many applications for the same purpose, using different channels for communication, and not keeping data in common areas to create a complex communication network. First of all, it should be an important element for companies to ensure that employees can access the data they want at any time. Reducing the use of paper, reducing e-mail traffic, and minimizing the time spent on document transfers should be minimized.

Companies should identify the applications that are used in a structured way and integrate these applications with each other. Different departments using different messaging applications or using different options for storage will create data pollution and file pollution. In addition, the motivation and belief of employees in this area will decrease. Companies should first reduce the number of applications used for the same function and continue with a single program. It is important that they establish a structured data storage

system for project files, Scrum reviews, and projects and that every authorized person can access these projects from one place. In this way, team members will be able to be aware of the projects they are involved in simultaneously, and the desired documents will be in a place where the whole team can easily access them.

3.2.1.5 Connecting People - Smart working

The study shows that , at the center of the Agile Transformation Journeys should be the people, and the employees in the company. A people-centered approach will give employees the necessary freedom and the option to make decisions as a team. Employee decision-making and parallel teamwork will give the firm the chance to be flexible to change, but will also make it easier for them to embrace change. Increasing communication between people will create a responsive and collaborative way of working. However, it is a very difficult process to adopt in companies.

The difficulty of this process stems from two sides. First of all, the concept of Smart working, which is accepted as a way of working today after Covid, allows employees to work from home, however, this application makes it impossible to track whether many people are actually working at home or not, which is not a very favorable situation for

employers and C-level management. For the employee who feels the stress of this situation, smart working can be a difficult decision and may feel pressured.

Since the Scrum framework gives daily and short-term tasks to the team members and at the same time puts the tasks to be done in the TO-DO blog of the individual, the fulfillment of the responsibilities of the employees is actually the completion of the user stories that they say they will do here. Smart working not only helps the employees to work in the way they feel best but also eliminates the lack of work at the management level.

Secondly, in traditional methods, departments are more intimate, but the lack of good communication between employees within different departments is less of a problem. In a project, there may be many employees from many different departments who will join and leave the team at different times. If companies want to improve the performance of these teams, they should first strengthen the communication of the people in the team. Although this is difficult to achieve in large companies, this problem can be solved in this way. "Shared Workspace". This concept will prevent the separation of employees into departments and create a working environment where anyone can sit wherever they want in a common area. In fact, the working environment, which is similar to a library, will allow different people from different departments to meet and communicate and will improve the relations within the company, that is, teamwork in the projects carried out. Intra-team and inter-company communication and trust play a major role in this area.

3.2.1.6 Technology Related Conclusion

This study analyzed the critical role of technology topics in the Agile Transformation process. Key issues such as performance monitoring, digitalization, software selection, simplification of complexity, and smart working emerged prominently. We realized that traditional methods of performance measurements do not adequately reflect the complexities of production processes and that alternative methods are necessary. We highlighted the importance of digitalization for speed and efficiency, noting that companies need to establish specialized departments for data-driven decision-making.
In software selection, we emphasized the importance of carefully choosing tools that fit needs and considering various factors.

We found that integrating applications and enhancing efficiency are necessary, and the smart working concept offers a human-centered approach, showing positive effects on agility and job satisfaction.

In conclusion, successfully addressing these technology issues will make companies more flexible and competitive. This process will require supporting employee motivation and cultural adaptation, necessitating long-term transformation, but with proper planning, good results will emerge.

3.2.2 ORGANIZATION RELATED

In this section, organization-related challenges were discussed, important points were identified in the interviews and these issues have been followed up. A total of 6 issues stand out in this issues. These issues are *Standardization challenges, Financial Support, Organizational Structures, Strategy/vision, Time management, Empowerment people, People Engagement* . In this section, we will look at these issues in more detail and before that, an overview of the interviews is shown in the table below. The interview results are grouped in this way and the common issues of the interviews are identified. In the Observation column, the observations of the researcher in the company are indicated. Interview fields indicate the period of the interviews.

Organization Related	***Observation***	***Interview 1***	***Interview 2***	***Interview 3***
Standardization challenges	*x*	*x*		*x*
Financial Support	*x*	*xx*	*xx*	*xxx*
Organizational Structures	*x*	*xx*	*x*	*xx*
Strategy/vision	*x*	*xxx*	*xx*	*xx*
Time management	*x*	*xx*	*x*	*xx*
Empowerment people	*x*	*xx*		*x*
People Engagement	*x*	*x*	*xx*	*xx*

Table 3: Organization Related Issues

3.2.2.1 Standardization Challenges

The study shows that after a company decides on Agile transformation, another challenge is for this company to determine the standardizations in this process. The quality of these standardizations is a serious challenge. Agile methodology is based on flexibility and rapid adaptation. For this reason, it is necessary to ensure continuity and consistency in production and operational areas. Lack of standardization in this context can lead to information pollution in departments, information, KPIs, and other vital areas, poor communication, time losses, and productivity losses, which in turn can reduce confidence in the Agile process. Communication breakdowns between different departments will also cause problems for the whole organization.

As mentioned above, one of the basic principles of Agile methodology is continuous improvement and change. Under this principle, standard procedures should be continuously analyzed and improved. However, when these improvements are not interpreted correctly between different departments and individuals working on the same subject, it is possible to experience inconsistency in the processes that will occur.

In order to avoid ambiguity in business processes, documentation, descriptions, and information such as how the work is being developed and the scope of the project should

be discussed and shared with the departments or persons involved. This will also enable people with multiple workloads to work more effectively between projects. General information meetings should be held with the team so that employees at different levels in the company can identify any inconsistencies in the work process and avoid confusion.

To address these issues, and to address the challenges of standardization, there needs to be a cyclically-wide understanding and harmonization of Agile principles and practices. All employees need to be trained in this area and at the same time be aware of the actions they need to take when necessary. In this process, collaborations and reports that will help to overcome this challenge should be properly reported and data sharing should be accessible to the employees in the mentioned areas or projects.

Feedback from company employees can lead to additional efficiency in the production area and have a positive effect on the preparation of a more accurate road map. Feedback and employee comments received during the processes will contribute to the production processes carried out in different areas to be more effective. The encouragement and motivation of employees to be innovative should also be adopted by the senior management. Coding standards, data structures, technical names used, standard language, documentation, quality control processes, and basic applications, etc. are among the areas that can be improved.

3.2.2.2 Financial Support

The study shows that financial support is a very important part of Agile transformation processes. Adequate financial support is essential for the successful implementation of Agile Transformation and for the adaptation of this situation by the company, not only in name but also in culture. In addition to the many innovations that Agile transformation brings to the company, it also requires training and investments for the adaptation and correct implementation of these innovations.

First of all, the senior executives in the company need to determine how much money will be spent on Agile transformation annually. One of the worst ways to reduce costs would be to cut training and continuous improvement from their budgets. If we want employees to contribute to Agile processes, companies are obliged to provide the necessary training, processes, and certifications to the employees in a complete manner. The reason for this is that the investment made will only be successful for employees who believe in teamwork and Agile methodology, if the employees do not receive the necessary information, there may be a loss of confidence and this may negatively affect the productivity of the whole team.

At the same time, when we say Agile Transformation, we are talking about a transformation process. Unlike training and culture change, it will also require expenditures in the form of implantation, maintenance, installation of these processes and in many areas. During these changes, additional revenues such as consultancy fees may be preferred by companies.

3.2.2.3 Organizational Structures

There is an organizational chart in companies. In Agile transformation, changes should be made in the organizational chart system that has continued until today. Company structure is a very important foundation stone in Agile transformation.

That the hierarchy in companies is moving horizontally rather than vertically. We cannot ignore the fact that the logic of only doing the tasks communicated by the top position in a certain way is now slowing down the projects. In Agile processes, Functional and Divisional structures need to work together.

Companies with a horizontal hierarchy structure will be able to adapt more quickly to the requirements of Agile transformation. The organizational structure, which is culturally persistent and vertically present in most companies, creates a major obstacle for employees to self-manage. The main symptom of this problem is the suppression of flexibility and creativity of employees.

In Agile companies and organizations, teamwork is more important than individual success. In the creation of teams, people who will contribute to the team should be included in the sprint and the team should be able to make its own decisions. The step-by-step completion of the necessary backlog items and the rapid resolution of challenges that cannot be solved by teamwork during this process is again the cornerstones of Agile information.

Through open communication and continuous learning, it is clear that there can be good communication between employees and management, as well as a significant increase in the quality of work done. In order for this structure to be adopted by the employees, the senior management must first adopt it. The creation of teams that are not adopted by the senior management will not develop this culture and this will be the biggest challenge.

As a result, companies that adopt a good Agile culture in Agile transformation can take faster and more effective action, while being customer-oriented and competitive in the sector. For long-term success, the organizational structure of the company needs to be handled very accurately.

3.2.2.4 Strategy/Vision

In the study, we identify that strategy and vision are the identities of a company. This identity is a guide to what they will be in the future and how they will get to where they want to be. The strategy sets the long-term goals of the companies/firms and at the same time determines how they will reach these goals, of course, milestones and necessary

steps are determined one by one and this makes it easier to follow the strategy. Vision is the identity of the company that it wants to be in the future.

These two concepts should be defined as a top-down approach in the Agile transformation process. From the most general form to the smallest stone, every work should have a strategy and vision. Although it may take some time to develop this culture, in fact, scrum teams need to develop a perspective for each project that is aligned and parallel to the main strategy and vision of the company. The most challenging areas in this process can be identified as cultural adaptation and resistance to change, while at the same time, the flexibility margin of the strategy should be taken into account. Agile transformation requires agility and the ability to adapt as quickly as possible to moment-to-moment changes in the world country or industry.

Once the right strategy has been developed, it should be revisited many times. Open and continuous communication is necessary to overcome the above-mentioned challenges. Constant communication between employees and senior management at all levels of the organization is necessary. This will ensure that in case of any missteps, the organization can get back on the right track and work towards common goals.

Secondly, Participative Leadership is of great importance. Giving importance to the ideas and suggestions of employees will help companies solve the problems they face more quickly. At the same time, developing pilot projects will ensure that the level of compliance with the determined project strategies can be observed.

A company or scrum project whose strategy is wrong or not clearly defined will have many problems in its course and will pose a big problem for the employees and teams that manage it. Companies will need to conduct a serious study on this issue and choose the most accurate and proportional to their interests.

The adoption of long-, medium--, and short-term strategies will, in general, allow us to more precisely determine the path we want to take and to see the feedback of these studies with the necessary KPIs or measurements.

3.2.2.5 Time Management

In traditional firm models, there is likely to be fixed planning at the beginning of the year. Employees and team members can identify projects that will contribute to the company's strategy and at the same time prepare a timeline for these projects. However, in Agile methodology, flexibility and being able to take action according to the situation are very important.

In the study we need to examine Time management in 2 different areas. Firstly, determining the time limits for the projects planned to be done at the beginning of the year will help to know which projects have more critical importance in the first place. However, these timeframes and projects need to be changed according to the direction of the sector, leaving room for flexibility. This requires the input of stakeholders and the proper use of resource management. Depending on changing project needs, companies can change projects during the year or use iterative planning to quickly resolve unforeseen delays and take necessary actions.

In addition, time management should also be used by scrum teams or Agile teams. Here we are talking about a project where the team members determine the daily outcome of a project and the workloads in the backlog are reduced one by one. However, if the workloads in the backlog differ from each other on a unit-time basis, this can cause a mismatch within the team.

Team members may not be able to predict the completion time of the minimized workload and this should be shared with the project owner and the team in scrum meetings to avoid a bottleneck. Based on my observations, minimizing a user story, then breaking it down into parts and presenting it as a value-creating part will increase team performance.

3.2.2.6 Empowerment People

As we mentioned above, the empowerment of employees has a serious importance in Agile Transformation. However, this empowerment process has its own challenges. Employees may not easily adopt this process. There is likely to be resistance to change. Before making an authorization in this area, the company should adopt a serious strategy and help its employees in this process with continuous learning.

However, empowerment naturally gives employees more authority and responsibility. Before this is done, it is important to talk to employees and find out what they think about it. In this process, identifying team leaders and having these team leaders work on a pioneer project as a trial at the beginning will have a positive effect on companies. In the work to be done as a trial, willing employees and employees who are also willing and have a leadership spirit should be identified and then this process should be initiated. Companies that enter this process very quickly may experience an increase in the workforce in the beginning, but in the long run, due to the increase in responsibility and natural disruptions in production, the daily work that will occur due to the increase in responsibility and natural disruptions in production will bring too much workload and responsibility for a worker in the field of manufacturing, so he will not be able to give full effort to the work he was originally planned to do. It will be more successful for companies entering Agile transformation to first carry out these studies with a demo group and then implement this strategy on a large scale.

It should also be checked that the necessary training and support is provided to employees. Having leading role models in the company will manage this process positively.

3.2.2.7 People Engagement

By using an Agile framework, we aim to increase the participation of employees. But when we say Agile, we do not only aim to use this framework. Companies that use a framework and expect everything to go in the best way will have problems in the short and long term. Certain actions and studies should be done for the use of this Framework. One of the most important elements for companies is that their employees and senior managers adopt the Agile mindset. And it will take time to establish this culture.

The biggest challenge in engaging employees is the merging of the pre-existing company culture with the new Agile culture. It needs to be harmonized with it. Since Scrum is more collaborative and team-oriented and enables quick action, it may be faster than expected to increase employee participation with the right communication.

An influential factor here is empowerment. Giving employees the necessary authority and enabling them to take responsibility, with the necessary freedoms, will increase human participation. Increasing job satisfaction will play a positive role in increasing the willingness of employees to participate.

In addition, the creation of a feedback process and the strengthening of bilateral relations, if there is an understanding of free speech and fearlessness in the internal environment, employees will be more involved in the projects and work they do.

3.2.2.8 Company Related Conclusion

In the study, we analyzed the challenges of standardization, noting that Agile methodology relies on flexibility and rapid adaptation, yet continuity and consistency in production and operational areas are crucial. To achieve this balance, it is essential to adopt a principle of continuous improvement and change, constantly analyzing and refining standard procedures. Regarding financial support, we discussed the necessity for adequate funding not just in name, but as part of the culture, emphasizing that budgets for training and ongoing improvement should not be cut, as these investments succeed only with teams that believe in and work towards Agile methodology.

In the aspect of empowering employees, we observed that this process has its challenges, including potential resistance to change. Therefore, companies must adopt a serious strategy and support continuous learning to assist their employees.

Lastly, on the matter of employee involvement, we noted that the Agile framework alone is insufficient; it is essential to blend the existing company culture with the new Agile culture. Providing employees with necessary authority and responsibilities, enhancing job satisfaction, and creating feedback processes are crucial for success.

3.2.3 CULTURE RELATED

In this section, culture-related challenges were discussed, important points were identified in the interviews and these issues have been followed up. A total of 2 issues stand out in this area. These issues *Resistance to Culture Change, Believing Psychological safety*. In this section, we will look at these issues in more detail and before that, an overview of the interviews is shown in the table below. The interview results are grouped in this way and the common issues of the interviews are identified. In the Observation column, the observations of the researcher in the company are indicated. Interview fields indicate the period of the interviews.

Culture Related	***Observation***	***Interview 1***	***Interview 2***	***Interview 3***
Resistance to Culture Change	*x*	*xx*	*x*	*xx*
Believing Psychological safety	*x*	*xxx*	*xx*	*xxx*

*Table 4: Culture Related I*ssues

3.2.3.1 Resistance To Culture Change

In this section, we will talk about the importance of resistance to change. One of the biggest challenges companies face on the Agile Transformation journey is also resistance to change. While this resistance varies from person to person, we can categorize it into three levels. Let's start with the people who are open and willing to change. These individuals are usually those who believe in the framework, have a desire to be pioneers, and are dissatisfied with the current culture. Their rate of change will be at the highest level, and they will also support the necessary changes within the company. As the second group, we can talk about people who have a medium level of resistance. These individuals can be grouped as those who are not affected by the current company culture and do not feel a sense of loyalty to the company.

The change and adoption process for this group will be somewhat more difficult, but adapting to the new culture will not be very difficult following the decisions from the senior management. For this group, resistance can be easily broken with the necessary training and a motivating activity and reward system. Lastly, there are groups of people who love the culture, have been working in the same way for years, and do not want to change. The resistance in this group is at the highest level. In this case, breaking their resistance to change will take a long time and will turn into a journey that needs to be carefully planned.

Initially, if these individuals are involved in active projects and are allowed to play an active role in the decision-making process, they may feel motivated and might succeed in decision-making and creating a dynamic team spirit among other Agile areas, then these individuals might move from the third group to the first group. However, the important and crucial thing here is that if the opposite situation arises, these individuals' belief in the methodology will be completely shattered, and they will prolong the change process in the company. Active follow-up and remote support with necessary thoughts by methodology leaders for individuals in the third group will make a significant difference.

3.2.3.2 Believing Psychological Safety

In the study we identify another important topic for companies on the Agile journey and all companies operating in the 21st century is the subject of safety psychology. This emphasizes the importance of how comfortable and secure an employee feels within the company. Ensuring that employees feel secure, creating environments conducive to productive discussions, promoting positive feelings and a sense of trust, valuing everyone's opinions, and this ideology against imposing bad ideas in a hierarchical command chain will primarily create a comfortable and safe working environment for the employees. Once this environment is created, companies will see a noticeable increase in their employees' motivation. Safety psychology is one of the top five issues that should be primarily addressed in Agile transformation. To create safety psychology within the company, it is essential to value the opinions of everyone from blue-collar workers to senior management. Individuals should be able to discuss their good and bad ideas in a

healthy environment. A structure should be established where managers' egos do not destroy good ideas and where the best idea wins.

Besides, regular motivation cycles given to employees by their managers, and leaders motivating their teams are equally important. There is no manual for this motivation. Based on observations, this subject, which is proportional to the increase in a person's experience, requires serious experience and is a skill with very fine nuances. People who can manage their own team, ensure quality work, and keep their team motivated at all times are the real leaders, and companies should spend significant time on creating leaders. These individuals will always drive the company forward, correctly impart the Agile mindset to their teams, and are indeed one of the most important assets of the companies.

3.2.3.3 Culturel Related Conclusion

The study highlighted the critical importance of cultural issues in the Agile Transformation process. Specifically, two main topics emerged: resistance to cultural change and psychological safety.

Regarding resistance to cultural change, we categorized employees into three groups: those open to change, those showing moderate resistance, and those exhibiting high resistance. We found that each group requires different approaches, and tailoring strategies to each group enhances success in the process and determined that particularly for the group showing high resistance, careful and long-term planning is needed.

In terms of psychological safety, the importance of employees feeling comfortable and secure within the company became apparent. They study noted that ensuring this safety requires valuing all employees' opinions, creating environments conducive to healthy discussions, and developing leadership skills.

In conclusion, overcoming cultural resistance and ensuring psychological safety are essential for a successful Agile transformation. This process requires patience and meticulous management. By understanding their employees' resistance and ensuring psychological safety, companies can execute this transformation, making them more flexible and competitive.

3.2.4 PEOPLE RELATED

In this section, people-related challenges were discussed, important points were identified in the interviews and these issues have been followed up. A total of 7 issues stand out in this area. These issues *Creating focused employees, New Skills Development Create engagement, Continuous Learning, Providing regular employee motivation,* Adaptation *of new employees to software programs – train, Statistics in projects can be demoralizing or reduce team performance* . In this section, we will look at these issues in more detail and before that, an overview of the interviews is shown in the table below. The interview

results are grouped in this way and the common issues of the interviews are identified. In the Observation column, the observations of the researcher in the company are indicated. Interview fields indicate the period of the interviews.

People Related	***Observation***	***Interview 1***	***Interview 2***	***Interview 3***
Creating focused employees	*x*	*x*	*x*	*xx*
New Skills Development	*x*	*xxx*	*xx*	*xxx*
Create engagement		*x*	*x*	*xx*
Continuous Learning	*x*	*xxx*	*xx*	*xxx*
Providing regular employee motivation	*x*	*xx*	*xx*	*xx*
Adaptation of new employees to softwares		*x*	*x*	*xxx*
Statistics in projects can be demoralizing or reduce team performance	*x*	*x*	*x*	*xx*

Table 5: People Related Issues

3.2.4.1 Creating Focused Employees

Another finding on the study, One of the critical issues, creating focused employees, is not often mentioned in literature but is actually a significant challenge. If we can accept that employees' adaptation processes in Agile transformation are one of the building blocks of Agile transformation, this issue should be addressed accordingly afterward. The Agile structure requires being Agile and taking quick actions, and the rapidly changing workflows and the variety of problems in the production environment place this issue among the top areas. Errors in production environments, which are highly random and require sudden intervention at unexpected times, can cause a person's focus area to change.

Firstly, ensuring that employees focus within the Agile framework requires establishing a balance among continuously changing projects and priorities. This situation increases individual responsibilities of employees, strengthening communication within and between teams. Effectively focused employees can develop faster and more flexible solutions, which allows for the completion of projects on time and within budget. This compliance is actually the desired structure for Agile transformation.

However, for employees to be able to focus in this manner, the work to be done must be clear, and priorities must be organized correctly by leaders. A person should feel satisfied in the area they are focused on and have invested effort in. Here, a significant responsibility falls on the managerial leaders.

Here, it is essential for companies or Agile responsibles to provide both employees and leaders with the necessary training to gain extra skills.

3.2.4.2 New Skills Development

As mentioned in 3.2.4.1, acquiring new skills is essential for a company during the Agile transformation process. Employees and leaders must be equipped with new skills that are necessary and suitable for their needs.

The process of managers gaining leadership qualities is a journey. Also, since every company is different from one another, we cannot clearly understand whether a person is a leader during the recruitment process. Of course, certain analyses can be made to determine if a person is suitable for leadership, but it must not be forgotten that every company, every employee, and every business process is different. Therefore, every employee should be provided with the necessary training within the company culture, and new skills should be imparted. These skills will determine who wants to be a leader and who does not. In this case, one of the most important skills to be acquired will be new skills focusing on teamwork and agility.

In the area of technical skills, developing the existing skill sets of employees will positively affect the work in terms of time, cost, and quality. It is essential for a company in the Agile process to aim to continuously provide its employees with necessary new skills, which is also a necessity in terms of internal motivation and job satisfaction.

3.2.4.3 Create Engagement

In the Agile transformation process, the 'Create Engagement' title forms the foundation of a successful Agile implementation as we identify in the study. Enhancing employee commitment will be effective in many areas. Many of these topics have been discussed earlier in this study, so under this title, we will discuss a topic not previously mentioned, such as the high performance area.

In this methodology, which necessitates being constantly changing and Agile, creating engagement in employees is very important for high performance and problem solving to be continuous and sustainable. In firms that fail to achieve this, disruptions in workflows, increased error rates, and deterioration of team motivation will be inevitable. Create engagement is actually a method that can be used to actively involve employees. An individual should first experience an increase in motivation in small projects, but then the team they work and are involved in should gradually grow. As employees also experience an increase in job satisfaction and development of a sense of responsibility, there will be a significant increase in the quality and speed of the work done.

Additionally, employees taking initiative will have a positive impact during the active role-taking process. However, for the processes mentioned above to occur, employees need to be willing and have trust in the methodology. First, it should be checked if the individual has this belief; if not, faith in the methodology should first be increased through

necessary training and supplements, and then the employee's responsibilities should be increased. While this topic will be an easy process to advance for white-collar workers, it will be a serious challenge in the production area for blue-collar workers.

3.2.4.4 Continuous Learning

Under the topic heading of Continuous Learning, it is again a mandatory category and one of the building blocks of Agile transformation. This area has been discussed several times in this study and its importance has been emphasized. For companies in the Agile transformation process, resource management should create an environment where employees can continuously learn.

Unlike other topics, we will examine this area in more detail. The hidden and unseen area here is actually whether employees are open to continuous learning or not. Not all employees may always have the motivation or energy to learn something new, or they may not want to expend this effort after professional burnout. We need to progress in two areas here. Firstly, individual character profiles should be created, and each employee should be categorized. Once this assignment is completed, a separate strategy should be determined for each group, and based on this strategy, the desire and motivation to learn should be instilled in the individuals. Once this level is completed, the subjects that the person enjoys and would want to learn should be identified. Then, the subjects that the person wants to learn should be compared with the areas that will drive the company's success in a positive direction, and the areas that fall within these two clusters should be

the continuous learning areas that companies offer to their employees. In this way, while an individual work path is created for each person, people's daily motivation will increase, and their commitment to Agile methodologies and the company will be enhanced.

3.2.4.5 Providing Regular Employee Motivation

Another challenge that companies will face during the Agile transformation process is providing employees with regular and positive motivation. Here, we are reminded again of the importance of the individual and the person in Agile methodologies. Valuing employees is another essential condition for the company during Agile transformation. Providing regular motivation to employees is a challenging and demanding process because, by nature, there will be changes in people's emotional states. While these changes occur, we need to treat each employee as an individual and provide regular motivation in the long term with Agile and different approaches.

While trying to provide this motivation, excessive pressure should not be applied. Certainly, completing the given work within the allotted time is a criterion, but any reaction shown to an employee in whom the company has invested for many years due to a lack of motivation will decrease the employee's productivity in the long term. As mentioned in 3.2.4.3, in the persona maps created for each group, the age, experience, and knowledge areas of individuals should be examined in more detail, and how to approach these individuals in cases of motivation or performance decline should be

determined beforehand. Here, Agile pioneers should regularly monitor these individuals, and if necessary, gather their thoughts during specific times through surveys or one-on-one interviews. In this process, individuals falling below a certain criterion should be supported with actions that will increase motivation, for example, a holiday or day off, extra training, or promotions, etc. The situation where the individual is demoralized should be addressed, and steps should be taken to increase their motivation again. At the same time, individuals who regularly have motivation should be noticed by leaders, appreciated, and work in a safety psychological environment, which will generally maintain the momentum of motivation increase.

Study shows that the top management's heavy involvement in this area will have a negative effect and create a constant feeling of being monitored among employees, which will have a negative impact within companies. Therefore, persona analysis must be done very well and comprehensively, and a successful strategy based on this should be determined.

3.2.4.6 Adaptation Of New Employees To Software Applications

With the rapidly growing and almost untrackable advances in technology, especially in the year 2024, alongside rapidly accelerating artificial intelligence developments, the way

many jobs are performed has changed. Companies can divide this process into three main categories: technology pioneers who follow and use these processes, employees who are open to change and use technologies they have previously learned in daily life but do not use new technological tools because they have not learned them, and finally, employees who do not believe in new technologies and want to complete a task in the old-fashioned way.

Creating programs and personalized systems specifically for the people we often talk about in Agile transformation is also one of our needs here. Emerging technologies and new tools allow us to perform many tasks very quickly. For example, tools like ChatGPT, Midjourney, DALL-E, actually enable us to complete many monotonous and unsatisfying jobs within seconds in companies. The use of these artificial intelligence tools or existing project management tools like Notion, Jira, etc., are cost-effective and significantly performance-enhancing options for companies.

Companies should first provide their employees with access to these tools, followed by the necessary training. In this process, a group created by the technology pioneers within the group should be formed, and there should be a meeting period where tools and technologies that will create a general positive impact in the company are discussed. Then, after this meeting, the purchasing processes for the tools selected by the members should begin, and the rest of the company should be taught how to use these tools. This way, both the communication and trust among employees will increase, teams rather than upper management can select tools according to their needs, and it can be demonstrated why these tools can be beneficial for those who do not want technological change.

The challenge here is that the participants need to have a serious level of knowledge at these technology meetings, which are expected to be held every three months. If these meetings are held only with volunteers participating, the meetings can deviate from their intended purpose.

3.2.4.7 Statistics In Projects Can Be Demoralizing Or Reduce Team Performance

Today, almost all companies proceed within a certain process without overlooking specific KPI parameters in their decision-making processes. The data-driven decision-making process yields positive results in many respects. Primarily, it will positively affect the decisions made by extracting a general understanding of the situation under review, and the company using past data for the future.

In companies undergoing Agile transformation, data-based decision making is actually an inevitable necessity. However, within this decision-making mechanism, determining the parameters carries vital importance. For example, productivity can be calculated by dividing a company's production amount by the total producible amount, and also productivity can be calculated by the ratio of total production time to workable time. This

situation requires the certain KPI values to be very accurately determined in advance according to the needs of the company. However, this situation is very difficult to handle for team performance.

Although the currently available velocity chart and burndown chart are used to measure team performance, they actually provide a general picture about the situation. Since the Story points in the tasks are determined by the team members, if people feel they are being monitored, these numbers can give misleading values. Here, the performance of the teams should be examined by considering every situation and should not be reviewed only based on story points.

It is important that the performance of the team should not be calculated based on certain data, but rather on the value produced. The impact of the work done on the main project should be determined by the product owners but specific historic data should not be collected. Data collected regarding the past will mostly affect the team negatively.
The challenge for companies is to collect non-historic data and follow the progress of the work without tagging individuals, and during this process, to keep the morale of the project team without them giving misleading information. The team can also evaluate this process internally.

3.2.4.8 People Related Conclusion

The study emphasized the critical importance of the human factor in the Agile Transformation process, identifying seven key areas: creating focused employees, developing new skills, fostering commitment, ensuring continuous learning, maintaining regular employee motivation, adapting new hires to software, and the impact of project statistics on team performance. The study highlighted the importance of managers under the diversity of challenges in rapidly changing workflows and production environments and stressed that continuous learning and skill development should be supported with training tailored to individual needs.

After the study , the recomendation forming groups of technology pioneers and holding regular tech meetings to facilitate new employees' adaptation to technology, also noted that performance measurements should focus not just on numerical data but also on the value created. Finally, a successful Agile transformation requires careful attention to human elements; focusing employees, maintaining their motivation, and adapting them to technology are crucial. This process demands patience and meticulous management; companies must approach employees individually and support their development to execute the transformation and become more flexible and competitive.

3.2.5 METHOD RELATED

In this section, method-related challenges were discussed, important points were identified in the interviews and these areas have been followed up. A total of 7 issues stand out in this issues. These areas *Respecting Time Box Viewing methodology as infallible* , *Job Prioritization - time management*, *Senior management needs to learn the framework , Starting projects without training people, – Expert Methodology Leaders*. In this section, we will look at these issues in more detail and before that, an overview of the interviews is shown in the table below. The interview results are grouped in this way and the common areas of the interviews are identified. In the Observation column, the observations of the researcher in the company are indicated. Interview fields indicate the period of the interviews.

Method Related	***Observation***	***Interview 1***	***Interview 2***	***Interview 3***
Respecting Time Box	*x*	*xx*	*x*	*xx*
Viewing methodology as infallible	*x*		*x*	*xx*
Job Prioritization - time management	*x*	*xx*	*x*	*xxx*
Senior management needs to learn the framework	*x*	*xx*	*xx*	*xx*
Starting projects without training people	*x*	*xx*	*xx*	*xxx*
Expert Methodology Leaders	*x*			*x*

Table 6: Method Related Issues

3.2.5.1 Respecting Time Box

Another issue that companies need to pay attention to during the Agile journey process is respecting the time box. It is very important to stay within the time intervals determined by the methodology. However, a different challenge noticed in meetings is the extra effort made to comply with these time boxes.

In an optimal and experimental environment, compliance with these time limits can be expected. At the same time, adhering to these time limits will be much simpler when using Agile methodologies in software development processes. However, in an area like production where variability is high, adhering to these time limits and keeping meeting times within the specified range is a serious challenge.

Defining these time boxes in a predefined manner will positively affect the quality of the work done, but feeling tense because of adhering to time limits, or other team members having a negative attitude towards those who cannot comply with these time limits, will adversely affect the project process. Companies must do their best to ensure teams comply with the set time limits, but a negative attitude should not be displayed if these time challenges are not met

3.2.5.2 Viewing Methodology As Infallible

In this study, we examined Agile methodologies in as much detail as possible and discussed the methodology in depth. However, it is important not to overlook a critical point: Viewing any methodology as a holy book can often create barriers for companies. That means the methodology should be flexible, non-restrictive for employees, positively impactful, and dynamic in structure, allowing companies to demonstrate commitment to the methodology and quickly adapt to the changing business world.

Especially on the Agile journey, companies should see this methodology as a guide and take precautions against all the difficulties mentioned above, but not as rigid rules to be applied in every situation. One of the fundamental principles of Agile methodology is adaptation and continuous improvement. This should apply not only to projects and workflows but also to the methodology itself. Instead of strictly adhering to it, it is essential to develop and optimize it over time, specifically tailored to companies. It must not be forgotten that we need to do this even more in production areas where change is constant and randomness is high.

Viewing the methodology as a holy book can limit employees' creativity and initiative. Employees are often forced to operate within the confines of what is considered ‘right,’ which can prevent them from producing original solutions. Especially in problem-solving processes, thinking flexibly and considering different approaches play a critical role in business success.

Moreover, the dogmatic application of methodologies can unnecessarily complicate business processes and lead to time loss. Each project and employee has different needs; thus, the application of the methodology must be flexible to accommodate these needs. In the production sector, within the supply chain, even a minor disruption can cause many problems, and solutions that are more flexible and intelligent as required by the team and situation will be more effective.

3.2.5.3 Job Prioritization - Time Management

The study shows that. in the Agile journey of manufacturing companies, job prioritization and time management include challenges that are quite different from those in the software sector. Firstly, while the path needed to complete a project is clear, foreseeing possible errors is very difficult. In manufacturing, job prioritization should not only consider the importance of the project but also the continuity of the production line and material flow. This requires a more strategic and planned approach, unlike the flexibility seen in software development.

Time management becomes complicated with unexpected situations such as machine failures, supplier delays, and interruptions in the line. Additionally, an employee involved in a Scrum project will also have responsibilities in many different areas within the company. When an employee is given job responsibilities in many areas, they need to decide which area's problem to solve first or which tasks to prioritize and how to manage their time.

Companies need to prepare the leaders they will train in this regard. As we have mentioned before, product owners must properly complete the plans of the active members in the team at that time. Therefore, companies should regularly, first with senior management and then with the product owners individually, establish clear

communication with the employees, and perform the best job prioritization without disrupting team motivation and with minimal impact on performance. An employee should not be overloaded with more work than they can handle, and in cases where they naturally cannot complete those tasks, they should not be demoralized, and the most efficient state of the employee should be brought out within the framework of safety psychology.

3.2.5.4 Senior Management Needs To Learn The Framework

In the Agile journey process of manufacturing companies, it has been emphasized many times that upper management needs to be informed about the methodology. This topic, which is actually the backbone of many critical areas, holds an important position in successfully handling the company's process. Within the company, new talents and the youth within departments can quickly learn and adapt to Agile working methods.

People who are new to working life, motivated by the challenges of the 21st century, are doing their best and are also able to more quickly adopt the culture of the company they have just started with. A person who has just started working can grasp the new culture, in this case the Agile working method, faster because they have no previous experience, and can also contribute to the team with more innovative solutions. On the other hand, an employee with years of experience in working life will adapt to this process more slowly.

The department responsible for Agile transformation in companies must first ensure full confidence in upper management regarding the Agile journey. Because the Agile working methodology is different from traditional working methods in many areas, people who have spent years in working life might be those who want to implement this methodology immediately and see results quickly, but this is not possible. It must first be ingrained in upper management that this journey will be long and challenging. After this stage, upper management should not start training the entire company and its employees on Agile all at once. Due to the randomness in the production area, many problems will arise simultaneously, and the Agile journey, which is attempted to be progressed quickly, will appear to be unsuccessful all at once. During this process, upper management should create trial groups in critical areas and progress step by step.

The more knowledgeable upper management is about the methodology, the more logical and consistent their expectations will be. For this reason, a serious training and culture change should first be made in upper management. Subsequently, in the case of trialing

Agile methodologies, based on my observations, having at least one employee who has just started working in the teams will positively influence the process. Senior employees will want to teach the new person the workflows, but at the same time, the newcomer, being proficient in Agile methodology, will indirectly keep the team within the process. This will build an invisible wall for commitment to the methodology.

3.2.5.5 Starting Projects Without Training People

The importance of this topic has been emphasized many times for companies in the study that have embarked on the Agile journey. In a company where Agile methodologies are not adopted and people do not know how the framework should progress, it will negatively affect the process.

Trial groups should be regularly determined, and training should be provided to employees in the production area for whichever framework is suitable. Scrum masters, product owners, and the team must be knowledgeable about the processes they will encounter throughout the project. Therefore, as previously mentioned, companies should prepare the necessary budget for these trainings and create a map on how to train different personnel in the company.

3.2.5.6 Expert Methodology Leaders

In the study, another aspect that companies need to pay attention to is the impact of scrum masters on the project. While this topic is open to discussion, in scrum teams, the scrum master is responsible for the correct use of the framework even if they do not have complete knowledge of the project. This is an effective method for software or small-scale projects.

In the software field, teams are naturally connected to each other, and due to the nature of the work, it is easier for scrum masters to keep the team within the framework. However, in production environment projects, scrum masters need to have a more effective grasp of the work being done.

Teams created during the process may consist of different departments; in this case, the product owner plays a key role in organizing the overall situation of the team and the necessary work processes. However, if scrum masters have a good understanding of the nature of the work, they can enable the product owner to progress in a more detailed roadmap. PO and SM can better explain the problems experienced in team performance situations or stakeholder meetings and can produce more proactive solutions with better

communication. Foreseeing problems that may occur in the production environment requires serious experience, so in production projects, at least in the initial stage of a project, scrum masters' mastery of the general process, terminology, and workflows will positively affect the team in retrospective meetings.

Additionally, people who are aware of the company structure and individuals' work capacities might ask for support in team collaboration. However, if this situation is also known by the scrum master, they can accelerate the team by addressing key people or supports in processes that create bottlenecks and impede progress. This situation must be approved by the PO, but in this case, the SM might have the opportunity to give good advice to the PO. The challenge here is that gaining experience in the production area requires a significant work history. Therefore, while this topic can be explained theoretically, SMs really need to exert serious effort to implement it.

In conclusion, the scrum masters having knowledge about the project will have a positive impact on the PO and team members. SMs should not have the right to make direct decisions, but if they can provide advice like a consultant, it will lead to more successful outcomes for the PO.

3.2.5.7 Method Related Conclusion

The study highlighted the critical importance of methodology-related factors in the Agile Transformation process. Six main topics emerged: adherence to time constraints, not viewing the methodology as the absolute truth, prioritizing work and managing time, senior management learning the framework, not starting projects without training employees, and expert methodology leaders. In terms of adhering to time constraints, the study emphasized the challenges created by variability in the production environment and underlined the need for flexibility.

Regarding the perception of methodology not being the absolute truth, noted that Agile should be considered a guide and that companies need to adapt it according to their own needs. In work prioritization and time management, we addressed the unique challenges of the production sector and highlighted the importance of handling unexpected situations. In learning the framework by senior management, we pointed out the significance of progressing step by step and working with pilot groups. On not starting projects without training employees, we emphasized the necessity of allocating a training budget and creating suitable training plans. And lastly, in terms of expert methodology leaders, we discussed the distinct role of Scrum Masters in production projects and the importance of having in-depth knowledge about the process.

CONCLUSION

In this study, the multifaceted challenges and critical success factors of the Agile transformation journey in a production-focused enterprise are examined in detail. Although this comprehensive case study shows that the implementation of Agile methodologies provides significant benefits, it also illustrates that careful application of strategies tailored to specific needs is necessary for successful adaptation. While it is clear that each firm will face different challenges, challenges that production-area companies might face have been grouped and solutions have been proposed.

Firstly, challenges related to technology, performance monitoring, and digitalization emphasize the necessity of customizing Agile practices to production environments, which differ from software development. Findings indicate that simplifying technological complexity and strengthening connectivity are not only beneficial but also mandatory strategies for increasing operational efficiency and ensuring team cohesion.

Organizational structure and cultural alignments also play significant roles in this transformation. This study reveals that resistance to change and the need for psychological safety are critical areas of strategic management focus for a smooth

transition to Agile practices. It is evident that an environment that encourages continuous learning and employee involvement can significantly reduce resistance and enhance adaptation. In terms of cultural adaptation, it has been understood how challenging the integration of corporate culture with Agile culture can be. It has been determined that companies should not rush in this process and that changing culture is a challenging process. The adaptation of employees to new systems, the management of cultural resistances, and the provision of psychological safety have proven to be decisive factors in the success of the transformation process.

In terms of human factors, it has been determined that motivating employees and developing their skills are central to the adoption and successful implementation of Agile methodologies. It is emphasized that every individual is different, significant efforts must be made for each employee persona, and personalized journeys must be designed to maximize the potential of teams and the human-centric culture in the workplace. Encouraging employees to actively participate in continuous learning and self-improvement processes has been clearly established as a necessary requirement for companies wanting to be Agile.

Furthermore, methodological considerations, especially viewing Agile as a rigid and flawless framework, highlight the importance of its implementation while maintaining flexibility and being open to iterative learning and adaptation capacities. The research advocates a balanced approach that respects timings while promoting a culture of innovation and the ability to respond to change.

Building on these insights, the study further reveals that the Agile Transformation process has a profound and multifaceted impact on companies. In the study we identified critical findings across six key areas: flexible application of the methodology, transparency, employee motivation and the necessity for continuous learning, challenges of cultural adaptation, transformation of organizational structures, and integrative use of technology. These findings demonstrate how companies can become more flexible, efficient, and competitive by embracing these aspects. Notably, Agile Transformation is transformative not only to business processes, also to the corporate culture and the employees' perceptions of their work. This complex integration necessitates a patient and strategic management approach to reinforce and sustain the changes. The study emphasizes that embracing this transformation process is a critical milestone in the companies' continuous development journey, paving the way for ongoing adaptation and improvement.

In conclusion, transitioning to Agile is not a one-size-fits-all path but a complex adaptation process that requires understanding both human and technical factors. This process requires not only knowledgeable but also highly adaptable leadership styles that can guide the organization through the complexities of change while maintaining employee morale and productivity. It is stated that top management and leaders themselves need to expend great effort in the development of this leadership style.

With the integration of insights from this case study, companies can better manage their own Agile transformations, select a more accurate strategy when making decisions, and then ensure thoughtful and effective implementation of these methodologies. This study

demonstrates that the successful integration of Agile in production-focused companies is not only about adopting new tools or processes but also about developing a transformative culture that advances both technological competencies and human-centric values.

For future work, propose creating a large language model to accelerate the backlog process in Agile projects and simplify user stories. This AI agent will take main fields from the backlog as input, break down these epics into less complex parts at each level, and then prepare daily story tasks. Such technological advancements will support the continuous development and adaptation strategies highlighted as essential in our study, ensuring that Agile methodologies can be implemented more effectively and with greater impact.

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