

Article

Sustainable Agility Culture—The Case of a Pasta Company

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Abstract: The ability of an organization to be agile, and, therefore, the organizational culture of agility that determines it, is a key characteristic necessary for enterprises to meet the challenges of the requirements of sustainable development under conditions of uncertainty. Uncertainty, in turn, is an inherent feature of achieving the challenging goals of growth and often survival in today's competitive enterprise market. Analyzing the organization's ability to be agile, the article includes the results of a study of the productivity of the pasta packaging process in a selected manufacturing company. The main purpose of the article was to identify the factors important for the implementation of the concept of organizational agility and to develop steps to follow the Shu Ha Ri methodology in a pasta packaging company in order to increase production productivity. Based on the data obtained in the form of the number of employees per shift and the amount of packed pasta, significant differences in the productivity of shifts were found, and the challenges of organizational agility were also identified, which include the changing nature of demand, the impact of the state of the machines on the continuity of production, and the occurrence of shortages at the packing stage due to the manual nature of the process. Based on the conducted research and analysis of the tools used in the formation of an agile culture, a proprietary approach to sustainably increase the productivity of the packaging process was proposed using the Shu Ha Ri methodology. The conducted research made it possible to formulate the paradigm of sustainable agility culture and its main dimensions for companies in the food industry.

Keywords: agility culture; agile enterprise; small and medium enterprise; pasta company; packaging productivity; sustainability



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1. Introduction

The agility culture of enterprise, especially nowadays, is an important issue that is the subject of research by many scholars around the world which, in addition to resilience organization [1–3], has become an attribute of companies following the turmoil of the pandemic and subsequent issues triggered by the incursion of Russian troops into Ukraine. The first articles on enterprise agility were published as early 1990s [4,5]. Nevertheless, the concept of an enterprise operating according to an agile culture has significantly developed after 2001 and the publication of the Agile Software Development Manifesto [6]. The concept of agility can apply to other areas, such as manufacturing, management, and programming, as well as to the overall operations of the company [7].

Agile manufacturing refers to the organization of a production system that ensures the delivery of a final product of high quality that fully meets customer requirements [4]. In addition, agile manufacturing is about overcoming unpredictable changes and risks that occur in a turbulent environment and using these changes as opportunities to advance the manufacturing process [8]. Agile management refers to a flexible and interactive process that leads to the delivery of a product or service to the customer according to their expectations. In other words, it is an iterative approach that takes into account the customer of a product or service and involves him in the production process [9,10]. The iterative approach also allows companies to manage the tasks of the production process

in such a way as to obtain the best solutions and deliver them to the customer as soon as possible, despite the constant changes that take place, which may cause deviations from the previously accepted assumptions. Agile software development, or agile programming, refers to iterative and incremental methods that have replaced the traditional approach to developing software. This makes it possible to deliver better and cheaper solutions to the user more quickly [11,12]. Agile enterprise allows companies to successfully compete with other business entities in an unpredictable market. This is made possible by constantly adapting, within the structure and methods of operation, to uncertainty and short-term opportunities that arise [13–15]. However, it should be remembered that there is a certain trade-off between agility factors, such as quality, innovation, speed, and flexibility, because a manufacturing company cannot achieve all these characteristics at the same time [16].

Due to their characteristics, mainly limited resources, small and medium enterprises (SME) rarely take full advantage of the opportunity offered by agile production and management methods [17–19]. Despite this, it should be said that a culture of agility can and even should also apply to small- and medium-sized enterprises, which are often able to take advantage of emerging opportunities and adapt to changing market conditions in order to stay afloat [20]. This is carried out through the use of innovative and modern production technologies and agile practices to manage the process [21]. As shown by the research carried out in SMEs [22], agile practices in companies can not only bring financial benefits, but also allow for better communication within the company, faster detection of discrepancies, and more effective problem solving.

With the adoption of agile methods and modern technologies in the operations of companies, including SMEs, it is necessary to control and evaluate them, especially in terms of production efficiency. Methods of assessing production efficiency can be based on KPIs (key performance indicators), i.e., indicators that allow efficient and effective control of the production process [23]. There are general production indicators as well as specific ones that are related to a specific industry and production process [24]. A set of relevant KPIs has been compiled into standards [25]. This makes it easier to define and apply them to the chosen area of production. One such indicator, used to assess the productivity of a company, is the index of labor efficiency and productivity [26,27]. The labor productivity index is a measure that is used to assess the productivity of employees and the efficiency of the use of human resources in a company. It is a key management tool for monitoring and analyzing employee performance in the context of specific organizational goals. The labor productivity index can be expressed in various forms, such as the number of tasks completed, units produced, and revenue or profits generated over a specified period of time [28–30]. By systematically monitoring and analyzing the labor productivity index, companies can identify areas for improvement and implement effective strategies to improve employee performance. Effective management of the labor productivity index can lead to increased operational efficiency, improved product or service quality, and better financial performance for the enterprise [31].

The aim of the research presented in the article is to identify the factors important for the implementation of the concept of organizational agility while ensuring the principles of sustainable development and to propose the adaptation of the Shu Ha Ri methodology in a production company that packs pasta. Additionally, agile activities using the Kanban board, lean manufacturing, and Scrum were proposed. Nevertheless, the greatest emphasis was placed on the Shu Ha Ri methodology. The research focused on observing, recording, and evaluating the production performance of individual shifts over a one-year period. Based on the results, changes in the production process were proposed to increase its efficiency while reducing shortages. The novelty of the article is the proposal to use the Shu Ha Ri methodology in the implementation of agility culture for a production company, especially one specializing in packaging pasta. This will allow for the verification of the proposed methodology and individual steps for such an enterprise. It fills a gap that exists because the Shu Ha Ri methodology is rarely used in the production process. The article is divided into four main sections. The Section 1 describes an overview of the agile culture, especially

considering small and medium enterprises, and defines the novelty as well as purpose of the research presented in the article. The Section 2 presents the existing problems in the pasta company mainly connected with productivity. The Section 3 (research and discussion) is divided into three subsections. The first one presents the research methodology. Then, the results of the expert survey related to the productivity and problems of the pasta-producing company are described. The last part of this section proposes changes and the introduction of agile methods to the company, which are intended to increase productivity and improve the work culture in the SME. The article concludes with a summary (Section 4) with directions for further research.

2. Problems of Changed Productivity in the Pasta Company

The pasta packaging process is a manual process due to the fact that the machine process causes damage to the pasta, which generates losses. Employees are selected for packaging teams and perform the manual packaging process in places designated for this purpose on the production line depending on orders from customers. The results of the study of the productivity of the pasta packing process at the selected enterprise are shown in Figure 1. The graph shows the number of kilograms of pasta packed, taking into account the shifts and the number of employees who worked on a given shift. To conduct a productivity analysis based on the given data, we can focus on two main indicators:

1. Productivity of work per shift, that is, the productivity of work per shift, determined by dividing the total amount of work performed in a given month by the number of employees working on a given shift. The productivity value in this case will be given in kilograms of packed pasta per employee per shift.
2. Total productivity in a month determined, as the sum of the amount of work performed by all shifts in a given month and dividing by the total number of employees working in all shifts in the same month. The productivity value, like the productivity of work per shift, will be given in kilograms of packed pasta per worker.

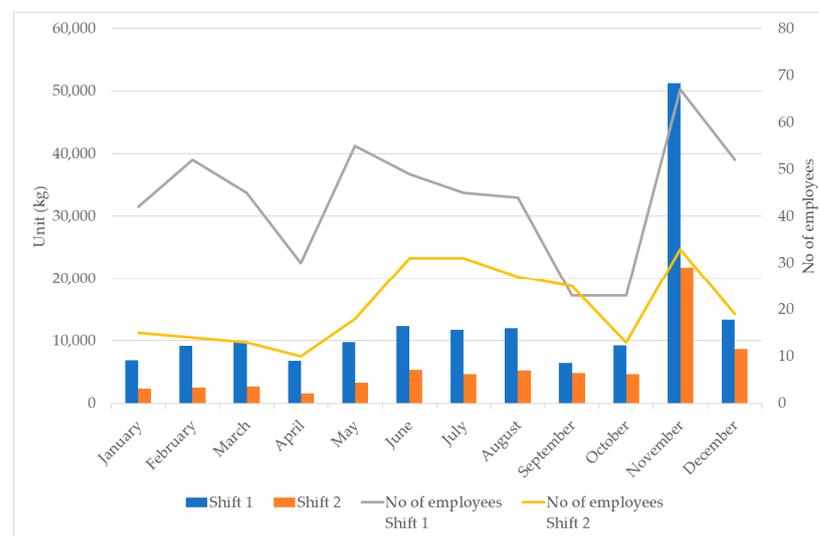


Figure 1. Packaging productivity diagram for the whole year.

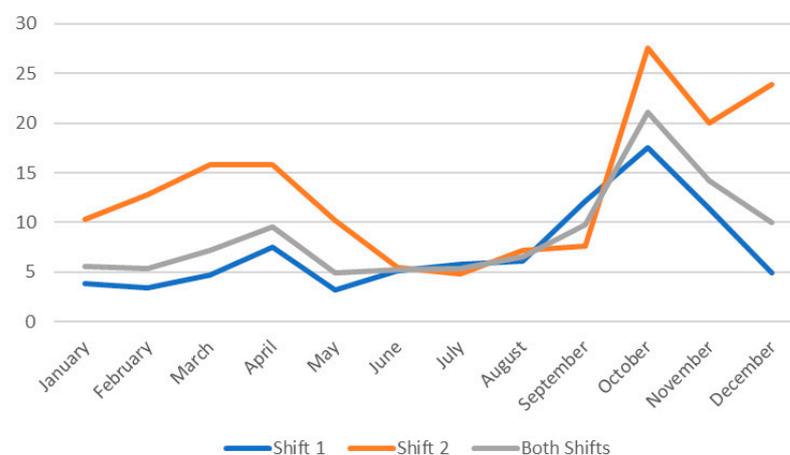
Considering the data presented in Table 1, it is important to point out the differences in productivity between different months and shifts. In some months and shifts, productivity was higher, while in others it was much lower. For example, in November, Shift 1 achieved very high productivity (764.69 kg per worker), while in January, Shift 2 achieved the lowest productivity (155.04 kg of packed pasta per worker). Analyzing this data allow to identify trends and determine which months and shifts are more productive and which may require action to improve productivity.

Table 1. Packaging productivity per employee.

Month	No of Employees Shift 1	Work Productivity—Shift 1	No of Employees Shift 2	Work Productivity—Shift 2
January	42	163.01	15	155.04
February	52	177.05	14	178.44
March	45	214.20	13	205.77
April	30	225.83	10	158.52
May	55	176.78	18	184.33
June	49	251.16	31	170.90
July	45	260.73	31	150.48
August	44	271.36	27	194.07
September	23	280.10	25	191.67
October	23	403.09	13	358.38
November	67	764.69	33	660.29
December	52	256.94	19	454.42

A detailed analysis of the productivity results shows that for the first shift, the average productivity was about 287 kg of packed pasta per worker, while for the second shift it was 255 kg of pasta. This gives an about 11% difference in productivity between shifts during the working month. The highest productivity values were obtained in November, and this was related to the highest number of workers involved in the packing process. On average, 44 workers worked on the first shift, while the second shift typically involved the work of 21 workers. More than twice the number of workers on the first shift also resulted in much higher values of pasta packed. The first shift packed an average of 13,206 kg of pasta per month during the time period studied, while the second shift packed 5623 kg, more than 100% less than the first shift. Based on the data presented, it is clear that there is a high variability in the productivity of workers and the entire packing process. An example of this phenomenon is the second shift. In the month of September, 25 workers packed 4791.8 kg of pasta, while the following month 13 workers achieved a similar value of packed pasta at 4659 kg.

In terms of average productivity per worker, one can see a fairly typical pre-holiday demand growth curve for the food industry. Quite surprising in this context is the high productivity during the second shift, which may indicate the completion of additional tasks by first-shift employees that are not directly translated into the amount of packed pasta (Figure 2).

**Figure 2.** Packaging productivity per employee (kg/day of worker).

In addition, the following problems were encountered during the implementation of productivity studies in the pasta packaging process:

- The manual packaging process of pasta causes shortages that manifest as damaged/crushed product, which is withdrawn from the commodity distribution chain at the quality control stage.
- Frequent production interruptions, machine breakdowns, or technical problems caused production losses, which included a reduced number of kilograms of packed pasta.
- An insufficient number of trained employees could lead to insufficient productivity and generate losses.
- Packing teams on individual shifts were improperly organized—teams with very high productivity and very low relative productivity compared to the average value of this parameter were observed.
- The large assortment of the plant producing and packing pasta, which causes frequent changes in the organization of production, as well as the need to rearm machines and adapt the packing process to the type of pasta.

3. Research and Discussion

3.1. Methodology of the Test—Case Study

The approach used in the article is a two-stage approach. In the first stage, data collected from a whole year of productivity were analyzed. On their basis, the main problems of maintaining high productivity and quality in a turbulent food market were formulated, as well as the main challenges for the company's sustainable development. These problems were presented to 10 specialists in agile implementation and food production, with 10 to 20 years of experience in enterprise management and implementation of agile innovations. The experts were asked the following questions:

- What is the nature of the identified production problems?
- What are the main challenges of agile and sustainable manufacturing?
- What agile methods can be helpful for the identified problems?
- What are the ways and practices to shape an agile culture?
- How will agile management methods align with sustainability goals?

The interviews were conducted through an extended, unstructured interview. Experts were presented with production issues and asked to respond to the issues presented above. The interviews were conducted in the second half of 2022 and were completed in February 2023. After the material was collected, the development of conclusions was carried out by compiling the answers obtained in terms of the research questions posed.

The second stage involves developing a roadmap for implementing a culture of agility using the Shu, Ha, and Ri model for a specific pasta company. The Shu Ha Ri methodology was developed in Japan and describes the steps to obtain excellence. The first step is to follow the rules and principles already in place. One should discipline one's conduct and follow the instructions and tasks given by the master. Then, in the next step, one seeks to break the existing rules when it is deemed possible and appropriate. In this step, innovations can be made, experiments are carried out, new hypotheses are made and, most importantly, one does everything without the help of the master. The last step, or Ri, involves a complete departure from forms and existing rules and opens the door to creativity. In this case, the student becomes the master and creates his own rules, practices, principles, adopting everything he has learned in the past. The above-described methodology was applied to the specific case of a pasta company. The research was carried out by taking into account the following post-processing stages shown in Figure 3.



Figure 3. Diagram for implementing research and introducing agile management in a pasta company.

The study of the pasta packing process was carried out for 12 months. During this period, both the number of workers who took part in the packing process on two working shifts was verified, and the number of kilograms of finished product that managed to be packed and prepared for further distribution was recorded.

3.2. Results of Experts Survey

As a result of interviews with experts, it was determined that the production problems identified are typical of the food production sector, and in this context, experts pointed to the following problems in food production by a small production company:

- Limited resources that make it difficult to invest in equipment and packaging technology, as well as difficulty allocating funds for research and development, which limits their ability to bring innovation and new products to market.
- Little ability to take advantage of economies of scale, making it difficult to compete on price with larger competitors.
- Challenges of quality control, and the constant raising of standards and the need to use manual labor during inspections.
- Seasonality and fluctuations in demand—the need to meet variable demand requires more flexible structures, relying heavily on the human factor.
- The need to achieve sustainability goals and reduce environmental impact can challenge small companies with limited resources to invest in environmentally friendly practices and technologies.

In terms of the challenges of agile and sustainable manufacturing, experts mainly pointed out the following:

- The need to change organizational culture, which can be a particular problem for employees/companies with a traditional approach to manufacturing.
- The role of communication and coordinating the activities of different departments and teams to ensure smooth communication (including from the bottom up) are key to agile manufacturing. This is especially difficult if the company previously operated in a more hierarchical manner.
- The need to use the right techniques and methods, and the conviction to use them.
- Adequate change management to overcome the resistance of employees and decision-makers, while encouraging the active use of the tools being implemented.

For agile methods that can help on the identified problems in the pasta packaging company, experts suggest using one of the following methods:

- Scrum, which is an agile project management methodology based on flexible iterations in which a team works on a specific set of tasks, enabling adaptation to changing conditions and continuous process improvement.
- Lean manufacturing, which is a production management methodology focused on eliminating waste, optimizing workflow, and delivering value to the customer by minimizing resources and production time.
- Kanban, which is a work process management method based on a visual board that allows for monitoring the flow of tasks through various stages, thus, optimizing efficiency and reducing waste during scheduled tasks.
- Shu Ha Ri, which is a development model in the context of learning and mastery, including three phases: Shu (learning and following the rules), Ha (deviating from the rules to explore) and Ri (transforming into an author and creating your own rules), often used in agile work methodologies.

In terms of ways and best practices used to shape an agile culture in companies, experts pointed out the following:

- Continuous improvement, which mainly involves improving processes and practices based on analysis of the results achieved and the reactions of customers and users of the product.

- Collaboration, which means promoting teamwork, sharing knowledge and skills, and striving to solve problems as a group.
- Communication, which will mainly involve the exchange of information, ideas, and opinions, contributing to a better understanding of the company's goals and solving problems that arise at the pasta packaging stage.
- Transparency of the enterprise's operations, which allows building trust within the team of employees and enables joint decision making as a group.
- Adaptation of introduced changes in the enterprise and adaptation to new requirements, which allows flexible response to changing working conditions, such as a turbulent environment.
- Trust and respect, such as showing respect for diversity of opinions and developing the ability to listen and understand the perspectives of other members of the production team.
- A leader as a guide who exemplifies an agile culture in practice, i.e., applying the values and best practices adopted for agility in the enterprise.

It is also important to use such agile management methods that will work in tandem with sustainability goals, which will also allow:

- Reducing waste—agile methods encourage the identification and elimination of waste in production processes, which has a direct impact on efficiency and the reduction in negative environmental impacts.
- Adapting to changes in a turbulent SME environment—sustainability requires the ability to respond quickly to changing conditions, and agile methods enable operations to adapt in response to new challenges, such as regulatory changes or market trends.
- Innovative solutions—agile management methods promote collaboration, creativity, and innovation, which can lead to the development of more sustainable solutions and products, which the company will then offer to the market.
- Team responsibility—sustainability requires the involvement of every team member, and agile methods emphasize responsibility and self-reliance, which contributes to building a strong and responsible company culture.

Summarizing the above answers provided by the experts, the next chapter proposes measures to introduce a culture of agility in the pasta company, which should help improve the company's productivity rate.

3.3. Changes in the Company by Agile Methodology

Human productivity, despite the intensive development of automation and robotics, still remains a determinant of the production outcome in many sectors of the economy, especially for smaller companies, where investment is limited and solutions require too many accompanying changes and reorganization of the entire manufacturing process [32].

Considering the identified problems that occurred at the pasta packaging stage, several agile methods can be proposed to improve the productivity of the company. One such agile method includes Scrum. The Scrum methodology is based on the work of a team in which each person has different competences supplemented by others. The product owner knows the product best; therefore, he is the person who creates a set of tasks in the production process. The list of tasks is ordered from the most important to the least important tasks [33]. The Scrum methodology has been used in the management of small and medium enterprises [34], large companies from the automotive industry [35], but also in enterprises from the food industry [36].

Applying the Scrum methodology to a pasta packaging company can significantly improve the productivity and flexibility of the packaging process. Under the Scrum methodology, a company can divide work into sprints, which are short periods of time, such as weeks, during which the team focuses on specific tasks, producing the right standard of packed pasta. In the case of pasta packaging, sprints can be scheduled to focus on optimizing the packaging line, eliminating delays, minimizing shortages, and streamlining the packaging process. Daily Scrum meetings will enable the team to monitor progress,

identify potential problems and respond quickly to changes. Thanks to the iterative and flexible nature of the Scrum methodology, the pasta packaging company will be able to adapt its operations to the changing needs of customers and the market, thus improving service quality and increasing customer satisfaction. To do this, the company should use the Scrum board. This is a visual tool that allows the team to track the progress of work and tasks within sprints. It allows for transparent monitoring of activities, identification of obstacles, and quick response to changes. The authors of the article proposed a Scrum board (presented in Figure 4) to the company manufacturing pasta. Each change will have its own Scrum board. Additionally, in order to control the packaging process, the board was divided into packing teams. During work, teams will regularly report on the status of the packaging process. They will indicate what needs to be accomplished, what type of pasta they are currently packing and how advanced the process is, as well as report on the completion of the packaging operation.

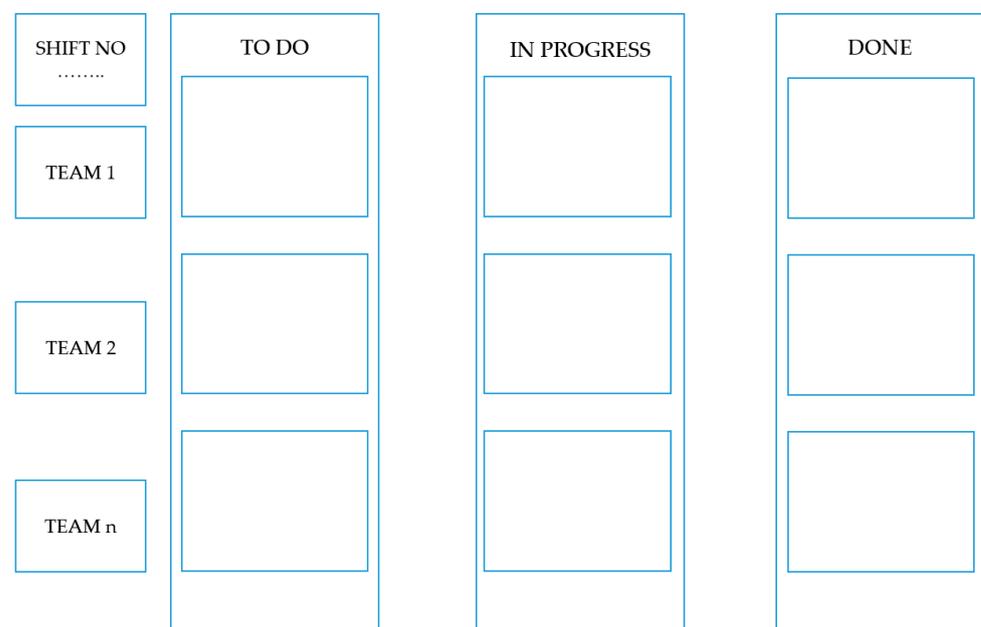


Figure 4. Scrum board for a pasta company.

Lean manufacturing is a process that improves production, which allows for adapting the final product to the customer's expectations and ensuring his satisfaction [37]. The idea of this management process is based on two branches [38]. The first one is the high quality of the product ensured in an agile production process. The second one is based on customer satisfaction and happiness. Lean production and sustainable manufacturing are of significant importance and influence on the position of companies on the turbulent market [39]. Therefore, the authors also included lean manufacturing methodology as one of the solutions to improve productivity. The two main assumptions of the authors that can be applied in the pasta production process are, primarily, just-in-time production and avoiding shortages. Appropriate adjustment of the pasta production process will also ensure a proper and optimal approach to the manual packaging process. This will ensure that workers packing pasta will have it delivered on time. There will be no downtime in the production process. Additionally, there will be no overproduction and no pressure on packaging workers that occurs when there is too much pasta. Moreover, timed production and, consequently, the packaging process will allow companies to generate time for quality control and elimination of pasta packages that contain too many defects. According to the authors of the article, due to the optimized production time, it will be possible to significantly reduce defects in the form of damaged pasta nests.

Kanban methodology can be used to continuously supervise the production process and introduce changes on an ongoing basis that will give priority to a specific task that needs to be completed in the company [40]. The Kanban board can be used to supervise the time of pasta packaging, especially in terms of compliance with individual standards for a given shift [41]. Additionally, the proposed Kanban board (Figure 5) can only be a certain model that will be changed by employees to adapt it to the conditions prevailing in the company. As the authors of Ref. [42] showed, it is possible, and kanban boards take different forms depending on the organization.

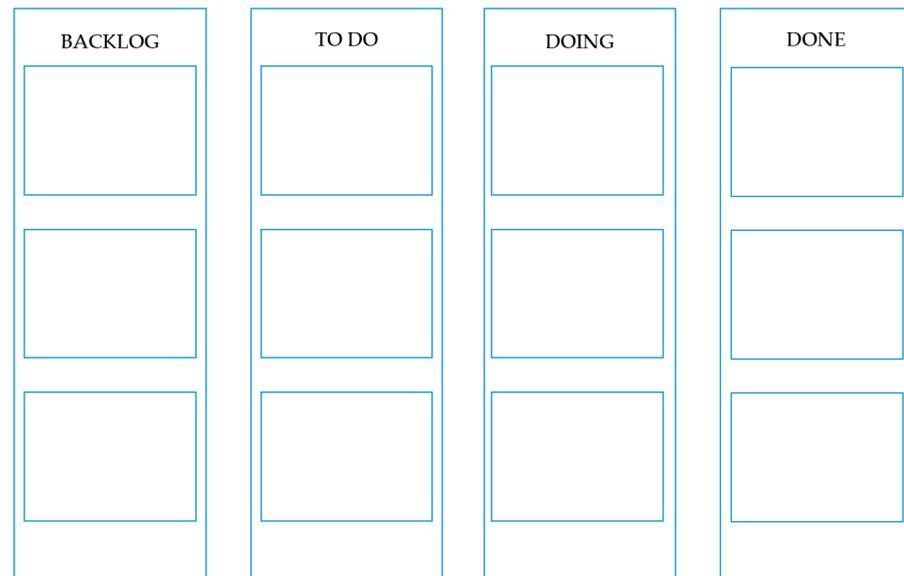


Figure 5. Kanban board for a pasta company.

If Kanban methodology is used, a pasta packaging company can better manage the workflow on the packaging line. A Kanban board can represent different stages of the packaging process, from package preparation to final quality control. Tasks or batches of pasta can be moved between stages as they progress, allowing for more efficient inventory management and reduced downtime on the production line. Visual representation of the packaging process will also enable identification of potential areas of delay or mismatch, allowing quick intervention and elimination of problems. Kanban methodology promotes continuous improvement of the packaging process, which will positively affect product quality and increase production efficiency. This is especially important in the food industry, such as for pasta packaging, where timeliness and quality are key to customer satisfaction.

Other methods of creating a company's agile culture include fostering the development of soft skills, such as communication, cooperation, flexibility, and problem-solving ability. This will allow for a better flow of information among employees and increase the productivity of the pasta packaging process. In addition, agile training and coaching support should be offered to employees, which will allow the team and the organization to better understand the agile philosophy and effectively put it into practice. Shu Ha Ri methodology has been used to overcome communication obstacles in learning English by Japanese people [43]. The results of the study showed that understanding the cultural background is just as important as the three-level approach, combined with classroom management techniques emphasizing paired and student-centered work through small groups. This will help build confidence and gain new experience.

The Shu Ha Ri methodology in management is a concept that describes the evolution of managerial skills from basic learning and application of standard practices to flexible and creative management in different situations [44]. It is particularly relevant in the context of agile management, which requires adaptability and continuous improvement. The use of this methodology allows businesses to eliminate and reduce all inefficiencies in the process

of employee training, which was proven by Ref. [45]. This methodology can also find application in requirements engineering (RE), where it is important for engineers to have experience and to strive to master the craft rather than just applying known tools to their work [46]. The Shu Ha Ri approach can be applied to improve the pasta packaging process and increasing productivity, allowing the process to evolve effectively in three stages.

The initial stage focuses on learning and understanding the standard procedures for packing pasta and adhering more closely to the set standards and rules. In this stage, it is crucial to teach the packaging team the correct operations they should follow as part of their work. This may include:

- Thoroughly training employees in standard packaging procedures to ensure uniformity and quality in the performed operations.
- Creation of clear packaging instructions to guide each employee.
- Supervision and support from more experienced leaders to help implement and solidify packaging standards.

In the advanced stage, the focus should be on investigating and understanding the causes of any problems or challenges in the packaging process. In this stage, changes and improvements can be implemented to increase productivity. Possible actions in this stage are as follows:

- Analyzing packaging process productivity data to identify areas for improvement.
- Conducting causal analysis, such as an Ishikawa diagram (cause-and-effect diagram), to understand why problems occur in the packaging process.
- Implementing new technologies or tools that can automate or improve certain steps of packaging.
- Experimenting with different packaging approaches to find more efficient ways of working.

The master stage, where the packaging process reaches a high level of efficiency and excellence. In this stage, the focus should be on the pursuit of innovation and continuous improvement. Possible activities in this stage are as follows:

- Encouraging employees to share their ideas and suggestions for improvements in the packaging process.
- Creating a culture of continuous improvement in which every employee is involved in identifying and solving problems.
- Establishing regular reviews of the packaging process to monitor performance and look for new opportunities for optimization.
- Investing in developing the competence of employees to become leaders in their areas of responsibility and innovation.

The Shu Ha Ri approach allows for the gradual improvement and adjustment of the pasta packaging process, which will help increase productivity and create an efficient and flexible work environment. In addition, the company is planning structural changes in the pasta packing teams. The aim should be to create teams of two people who will pack a minimum of 672 kg of pasta per shift. At the moment, this productivity rate is not achieved and is very far from being reached. Moreover, the company intends to make every effort to ensure that any personnel changes do not affect the minimum productivity rate. The proposed Shu Ha Ri methodology should allow the assumed minimum kg of pasta to always be packed in a shift. The individual stages of implementing the Shu Ha Ri methodology are presented in Figure 6.

In a pasta-producing company, the use of the Shu Ha Ri methodology can bring many benefits in terms of improving the productivity of production and the packaging of pasta. Research recommendations related to the proposed methodology include focusing on several key areas, which include three stages (Shu Ha Ri). First, the company should constantly analyze and update its production procedures (pasta packaging) while maintaining appropriate quality standards. Second, encouraging employees to think creatively and experiment with new ideas can lead to the discovery of more efficient ways to pack,

which will increase productivity. Third, investing in technology and market research allows the identification of new trends and opportunities in the pasta market. In addition, the company should develop an organizational culture conducive to innovation, which may include continuous training of employees and support for research and development projects that will be implemented with their participation. In this way, the Shu Ha Ri methodology can help a pasta production company adapt to the changing market environment and achieve higher productivity in the packaging process.

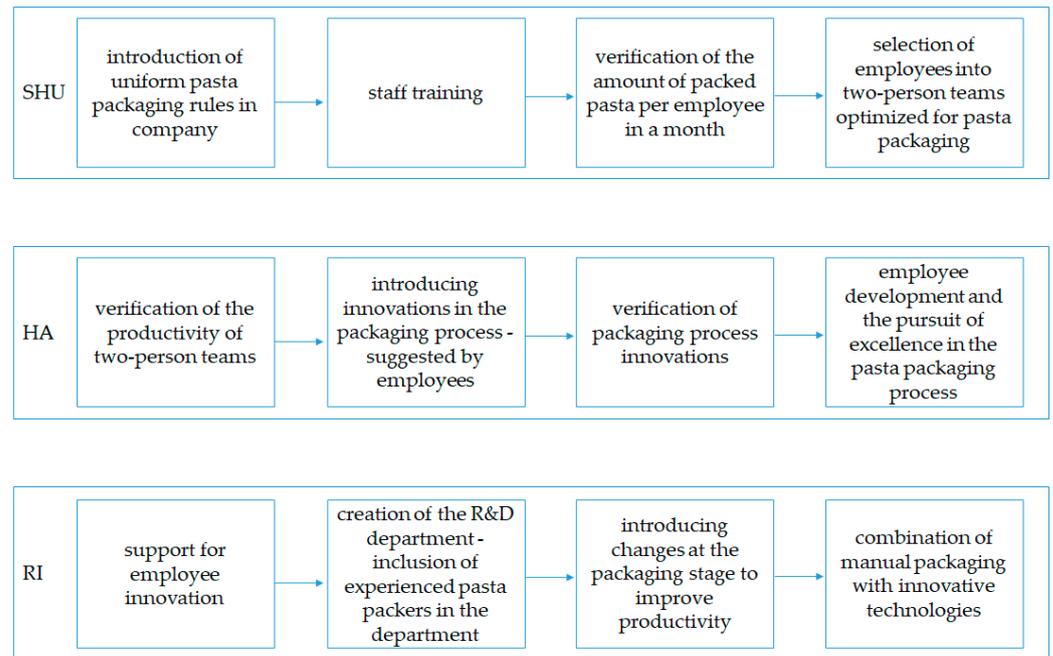


Figure 6. Shu Ha Ri steps in a pasta company.

Table 2 summarizes all four proposed agile methods that can be used at the stage of pasta production and packaging. The most important aspects from the point of view of implementation, use, and increasing the production efficiency of each method were also taken into account.

Table 2. Summary of agile methods in a pasta production company.

Criterion/Methods	Scrum	Lean Manufacturing	Kanban	Shu Ha Ri
Difficulty of implementation	Introducing Scrum in a pasta company can be difficult, especially if there is already an established production process. Change may be met with resistance from the team.	Implementing lean manufacturing in a pasta producing and packaging company can be a challenge that requires careful planning and commitment of the entire team.	Implementing Kanban in a pasta company may be simple, but it requires proper preparation and team involvement.	The use of the Shu Ha Ri methodology requires the use of three basic steps, during which the company will focus on compliance with pasta packaging standards, then open up to innovations in this area and develop its own solutions.
Time-consumption	The Scrum methodology is not time-consuming in itself, but the way it is implemented, and its complexity, can affect how long it will take to fully implement and manage the project in pasta company.	Implementing lean manufacturing can be time-consuming, but the benefits in terms of increased efficiency, reduced costs, and improved product quality can be significant.	Implementing Kanban in a pasta manufacturing and packaging company can be relatively time-consuming, but the time required for implementation depends on several factors, including the size of the company, existing processes, and the level of preparation of the team.	Implementation the Shu Ha Ri methodology into a pasta manufacturing and packaging company can be time-consuming because the approach requires specific development and evolution steps that occur gradually.

Table 2. Cont.

Criterion/Methods	Scrum	Lean Manufacturing	Kanban	Shu Ha Ri
Difficult to use at the packaging stage	Scrum introduces regular meetings, such as weekly sprint meetings. In the case of pasta production, where the process may be more constant, these meetings may be considered unnecessary and time-consuming.	Difficulties related to the implementation of lean manufacturing in the food industry may result from several factors (organizational culture, existing processes, striving for improvement in the production process), but with the right approach they can be overcome.	The use of Kanban at the packaging stage in a pasta manufacturing and packaging company is usually easy to implement because Kanban is a workflow management tool that is simple in its conception and application at the production stage.	Using the Shu Ha Ri methodology at the packaging stage in a pasta production and packaging company can be difficult because this approach involves gradual development and changes in the packaging process.
Management/owner involvement	Successful Scrum implementation requires full commitment from the pasta company's management, which can be difficult to achieve.	The implementation of lean manufacturing requires the involvement of the entire team and company management. This may be difficult to achieve.	Kanban at the packaging stage in a company producing and packaging pasta may require the involvement of the owner or management, which mainly involves supporting the process of change in the company.	Shu Ha Ri is an approach that assumes gradual development and changes in the approach to the process, and the involvement of management is important and necessary for the entire process to end with a positive change.
Flexibility	Scrum allows users to adapt the project to changing market and customer conditions. In the case of pasta production, users can easily adapt to changing consumer preferences.	Lean manufacturing, by its nature, focuses on eliminating waste and optimizing production processes to increase efficiency and reduce costs. Although lean manufacturing can be adapted to a variety of industries, including pasta production and packaging, the flexibility of the method depends on how it is implemented and adapted to the specific company and its needs.	The use of Kanban at the stage of pasta production and packaging can help increase the company's flexibility to some extent, but the Kanban method itself does not guarantee flexibility. Flexibility depends on how Kanban is implemented and adapted to the company's specific situation.	The use of Shu Ha Ri in the production and packaging of pasta can help increase the company's agility, but it is worth understanding that flexibility is not an automatic result of this approach. Flexibility depends on many factors, including how Shu Ha Ri is implemented and what changes are made.
A clearly defined goal	Scrum requires that project goals are clearly defined and understood by the entire team. This can help avoid confusion and misunderstandings in the pasta company.	Lean manufacturing can help clearly define goals in the pasta production and packaging process. As part of a lean approach, defining and communicating goals is a key element that helps the team focus on delivering customer value and eliminating waste.	The use of Kanban at the pasta production and packaging stage can help to clearly define production and work management goals, but Kanban itself is not a tool for defining goals. Kanban is a workflow management method that helps users to control and monitor production processes and manage tasks visually and efficiently.	Shu Ha Ri is an approach based on personal development and process improvement. Although not directly related to goal setting, it can help to understand what goals and changes are needed in the organization (pasta company).
Team commitment	Scrum promotes team commitment and accountability for achieving project goals. In the case of pasta production, this can help to improve product quality and production efficiency.	Lean manufacturing can have a positive impact on the involvement of the pasta production and packaging team through greater responsibility and commitment of workers, understanding their goals, and continuous improvement.		Team commitment depends on many factors, including management's approach, the organizational culture, and the way Shu Ha Ri is implemented.
Regular inspection of the methodology used	Scrum requires regular design reviews and adjustments. In the case of a company producing pasta, the production process can be constantly adjusted to changing conditions.	Lean manufacturing is a process of continuous improvement. Companies must constantly analyze and adapt their processes, which can be demanding.	The use of Kanban at the stage of pasta production and packaging is not in itself a tool that clearly defines the team's commitment. Team engagement depends on many factors and must be monitored using other tools.	Team involvement is a matter of organizational culture, personnel management, and communication in the company. However, Shu Ha Ri can have a positive impact on the production team's level of commitment.

Sustainable agility culture is a concept that blends two important aspects of modern business philosophy: sustainability and agility. This approach refers to creating a corporate culture that not only values flexibility and adaptability but also places a strong emphasis

on sustainability principles, both in terms of environmental stewardship and long-term business viability. For sustainable agility culture, key features to consider are aspects of adaptability for employees and their encouragement to embrace change, learn quickly, and adapt to new circumstances. It also covers the culture of promoting continuous improvement, experimentation, and the development of innovative solutions. Within that concept, an important aspect is environmental responsibility, which involves sustainability practices that are integrated into daily operations, reducing the environmental impact of undertaken activity. Future studies should also take into account the resilience aspect of agile culture, because that idea helps the organization respond effectively to crises, while sustainability practices reduce risk and build resilience in the face of environmental and social challenges. Continuous improvement, which can be enhanced via Shu Ha Ri methodology, is also an important factor for employee engagement, because a culture that values sustainability and agility can attract and retain top talent, as employees are often drawn to purpose-driven organizations. The concept of sustainable agility culture requires balancing between these two ideas, while fulfilling short-term agility needs can be challenging for long-term sustainability goals. One interesting further research aspect could be examining how allocating resources to both sustainability and agility initiatives can be demanding, especially for smaller organizations. The aspect of leadership commitment, both from practical and scientific perspective, should also be mentioned, especially as sustainable agility culture must be led by example.

4. Estimation of Significance Level of Productivity Factors in Terms of Agility Culture

In the scientific literature, there are studies of various results that introduce new methods of assessing factors from the point of view of considering the problem. Toslak et al. [47] used the integrated PSI-SV-MARCOS method to select a peanut butter machine. Criteria important from the point of view of this device were selected, provided by the factory manager, and then weights were assigned to individual criteria. All of the steps managed to choose the right butter machine for a factory producing peanut paste. Więckowski et al. [48] presented the research results of his own method (RANCOM), which can be used to determine the weight of criteria based on the assessment of experts in a given field. Taking into account the above considerations, an analysis was performed, the results of which are presented in Table 3. Each criterion was given a weight, and the sum of the individual weights was equal to 100. Points for individual criteria were assigned from 1 to 4, where 1 is the best solution from the point of view of the company from the food industry and 4 the worst. The authors assigned weights to individual criteria based on interviews with experts dealing with agile management methods, while the points were determined based on authors experience and the characteristics of a company producing pasta, which the authors know very well.

Table 3. Results of a point analysis of criteria for introducing agile methods to increase productivity in a food industry enterprise.

Criterion/Methods	Weights	Scrum	Lean Manufacturing	Kanban	Shu Ha Ri
Difficulty of implementation	10	4	3	1	2
Time-consuming	15	3	4	1	2
Difficult to use at the packaging stage	25	4	3	1	2
Management/owner involvement	5	4	3	2	1
Flexibility	10	3	2	4	1
A clearly defined goal	10	3	2	4	1
Team commitment	15	4	3	2	1
Regular inspection of the methodology used	10	4	3	1	2
	Sum	365	295	180	160

Considering the criteria in Table 3, it can be seen that from the point of view of the productivity of a company producing and packaging pasta, the best agile methodologies

used to improve the production process are Shu Ha Ri and Kanban (the lower the number of points obtained, the better the agile method is—based on the experts). Experts pointed out both the simplicity of using Kanban at the production stage, as well as the advantages offered by the Shu Ha Ri methodology in terms of employee development and unification of production process standards. The other two methods received a higher number of points, which translates into experts' opinion that there are certain difficulties in their use in a food industry enterprise. However, the authors intend to verify the results of the point analysis by implementing all four methodologies (at different times and on different shifts) in order to determine which one will work best in the conditions of a pasta production company.

5. Conclusions

The article proposes solutions to introduce a culture of agility in the pasta packaging process at the selected enterprise. Taking into account the packaging process and its productivity to date, problems and weaknesses requiring improvement were identified. Variable productivity was analyzed, resulting in the organization of work teams in addition to the usual seasonal and daily fluctuations. Corrective actions were proposed, according to the Shu Ha Ri methodology, to introduce agility during the pasta packaging stage and optimize the process for productivity. In addition, the article presents criteria for introducing and evaluating three other agile management methods (Scrum, lean manufacturing, Kanban). Each method is described in terms of selected criteria that are relevant to the pasta enterprise. Attention was paid to the possibility of self-improvement of production workers and the entire packaging process according to Shu Ha Ri, mainly because this methodology will be implemented in the noodle company first. This will close the productivity gap between shifts and teams, as well as provide opportunities for employees to grow and introduce new and innovative ideas to improve the packaging process.

The analyses presented here have made it possible to draw some preliminary conclusions regarding the need to develop a culture of agility, although it should be noted that an important limitation of the research carried out is the fragmented and individual nature of the research conducted. The analysis concerned a specific period, during which many companies faced a previously unknown phenomenon of virtually shutting down a significant part of their activities and, therefore, their goal was organizational resilience [49]. Perhaps, therefore, in future periods some of the factors influencing productivity will have already stabilized. Nevertheless, an examination of the overall ability to modify one's productive capacity will be a desirable feature for companies with different goals.

Further research directions that the authors intend to develop are primarily the verification of the proposed solutions of agility culture in a pasta manufacturing company (SME). In addition, the proposed approach can also be applied by other researchers in the study of other enterprises, not only in the food industry. The authors plan to use the collected information to improve the agile culture in SME and propose general principles in the future that can increase the productivity of such enterprises in an agile way.

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