DisneyHint: Lean and Coaching-Based Employee Suggestion System for the Human Challenges of Industry 4.0

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Abstract:

Purpose: This article introduces a fresh approach to the Employee Suggestion System (ESS), integrating Japanese and American Lean methodologies with coaching principles, notably the Disney Strategy. Its objective is to tackle human challenges in Industry 4.0, including boosting employee engagement and commitment, fostering innovation, and safeguarding organizational knowledge—critical solutions for mitigating the impact of the Great Resignation phenomenon.

Design/methodology/approach: An abductive methodology was utilized, combining deductive and inductive approaches. The deductive phase involved a systematic literature review on Employee Suggestion Systems (ESS) to establish a theoretical foundation. Concurrently, the inductive phase consisted of 30 interviews, conducted in two stages. Initially, 17 interviews focused on analyzing ESS practices within three multinational companies, alongside insights from the literature review. Subsequently, 13 interviews assessed the reception of the new ESS concept in addressing practical challenges within the Industry 4.0 paradigm in these contexts. The system concept was then subjected to modelling, prototyping and testing using the co-design methodology, integrating elements of the Japanese (Kaizen Teian) and American ESS (Kaizen Teian adapted to Western industry) approaches.

Findings: This article introduces an Employee Suggestion System (ESS) concept and tool that combines elements from both the Japanese and American Lean approaches to ESS (not studied, until now, systematically), incorporating coaching principles. Drawing from the Kaizen Teian tradition, it encourages groupthink, while also embracing American influences by promoting innovative thinking (using the Disney Strategy) through a rewards strategy, including gamification.

Originality/value: This paper presents a novel ESS concept designed to adapt to contemporary industrial settings by combining Lean principles with technology integration and human-centric approaches such as the Disney Strategy. Designed to address the specific challenges faced by Lean companies pursuing digital strategies, this tool provides a solution to three key Industry 4.0 challenges: empowering the workforce through voice behavior, preserving organizational knowledge, and promoting innovation.

To cite this article:

1. Introduction

Industry 4.0 merges analogue and digital systems and promises factories to achieve a greater variety of products with less downtime. Therefore, this trend has been accepted in both research and industry as a means of managing the new consumption paradigm (Nguyen-Ngoc, Lasa & Iriarte, 2022; Rautiainen, Pantano, Traganos, Ahmadi, Saenz, Mohammed et al., 2022). Besides the benefits of this new revolution, some challenges were highlighted, such as unemployment for low-qualified workers, the increasing precariousness in society, and the demand for training to accomplish the requirements caused by the labor market (Kowal, Włodarz, Brzychczy & Klepka, 2022; Sony, 2020). The challenges mentioned lead to a new and more effective approach to human resources development. Because of that, the digital transformation will call for new competencies and changing job profiles, which can encourage organizations to upskill their staff members and guarantee job retention (Agarwal, Mathiyazhagan, Malhotra & Saikouk, 2022).

The global phenomenon of the Great Resignation is threatening the competitive advantage of companies, as the human capital, the primary source of innovation, is becoming increasingly volatile, with no retention of the tacit knowledge of these individuals (Kuzior, Kettler & Rąb, 2022). The value of knowledge that collaborators get, is crucial and represents a considerable loss if they leave the company (Salvadorinho & Teixeira, 2021a). Workers who are pleased in their professions are more engaged, more productive, and less likely to leave. This has a relationship with the fostering of job satisfaction which helps the company achieve its objectives by ensuring that workers feel physically and emotionally secure and comfortable (Duan, Deng & Wibowo, 2023; Kwiotkowska & Gębczyńska, 2022). In this scenario, workforce engagement is required to ensure the competitive advantage in the organizations (Saks, 2022; Schneider, Yost, Kropp, Kind & Lam, 2018; Wang, Yuan, Feng & Peng, 2022) and the participatory design is a good predictor concerning its promotion (Kaasinen, Schmalfuß, Özturk, Aromaa, Boubekeur, Heilala et al., 2020; Romero, Stahre & Taisch, 2020). According to Saks (Saks, 2022), autonomy and participation in decision-making, which are integrated in participatory design, positively affect workforce's engagement, corroborating the impact that an active role by employees can have on their engagement towards work.

Through participatory design, end users or potential consumers are involved in the innovation process (Gasteiger, Ahn, Lee, Lim, MacDonald, Kim et al., 2022; Kalmpourtzis, 2019), which in turn can benefit and take advantage from the usage of the Disney Strategy, a strategy belonging to Neuro-Linguistic Programming and used in Coaching (Dilts & DeLozier, 2000). The Disney strategy was highlighted in Kotera, Sheffield and Van Gordon (2019) as an invaluable tool for fostering creativity and aiding participants in their professional career planning. The consensus was that amidst the stress and pressure of daily tasks, setting clear and compelling future goals can offer individuals a profound sense of purpose in life.

The most common way organizations foster participatory design is through employee suggestion systems (ESSs), which have their origin in Kaizen (Kagan & Krzos, 2021). The Kaizen Teian is the Japanese approach to ESSs which was adapted to the western industry during this type of systems proliferation, urging the American ESS approach (Kagan & Krzos, 2021). These methods aim to collect employees' ideas, foster innovation in the organization, and simultaneously contribute to an increase in voice behavior (Behavior that falls into challenging the status quo to improve rather than just criticize), resulting in employee participation in decision making and disruption of the current status of the company (Chopra & Fernando, 2020; Marksberry, Church & Schmidt, 2014).

Another factor that can extend or enhance workers' engagement is gamification, which involves incorporating game-like incentives such as points, badges, or leaderboards into non-gaming environments (Brauner & Ziefle, 2022; Clarke, Davis, Buckley, Potvin, Thirunarayanan & Jones, 2022; Passalacqua, Léger, Nacke, Fredette., Labonté-Lemoyne, Lin et al., 2020).

This article introduces DisneyHint, an innovative employee suggestion system that combines Lean Manufacturing principles with elements from Japanese and American ESS methodologies. Additionally, it incorporates coaching principles inspired by the Disney strategy, fostering a culture of innovation and creativity among employees. It addresses challenges presented by the Industry 4.0 and the Great Resignation paradigm by promoting employee involvement, preserving organizational knowledge, and fostering innovation. These efforts aim to create and sustain a competitive advantage. These challenges, practical in nature, have been observed in three multinational organizations. To achieve this goal, an abductive methodology blending deductive and inductive methods was employed. The deductive aspect involved a systematic literature review that juxtaposed the concept of employee suggestion systems with Lean Manufacturing and Kaizen principles (an analysis that has not yet been carried out in the scientific context). Meanwhile, the inductive facet involved conducting interviews with three industrial cases (multinational companies). This process comprised two phases: firstly, analyzing the current ESSs, and secondly, establishing a new ESS concept that incorporates insights from the literature and addresses the Industry 4.0 challenges faced by the three companies due to their ongoing digitization efforts. Following the definition and stabilization of the concept, the paper describes the modeling and prototyping of a digital ESS that integrates a tool for neurolinguistic programming and coaching, named Disney Strategy.

The remainder of this paper is structured as follows. Section 2 refers to the research methodology used, demonstrating 4 objectives to be achieved. Section 3 presents the results, divided into two subchapters: Theoretical perspective on the role of Employee Suggestions Systems and Practical perspective on the role of Employee Suggestions Systems. Section 4 discusses all results, bringing together the theoretical and practical perspective, and section 5 summarizes the most important conclusions and future work.

2. Research Methodology

2.1. Research Design

The aim of this work is to introduce a novel concept of an Employee Suggestion System (ESS) that merges Lean principles from both American and Japanese approaches, while incorporating coaching methodologies, leveraging the Disney Strategy. This ESS is designed to address the human-centric challenges posed by Industry 4.0, such as enhancing employee engagement, preserving tacit knowledge, and fostering innovation. To achieve this objective, an abductive methodology is employed, blending inductive and deductive approaches (Hurley, Dietrich & Rundle-Thiele, 2021). Abduction serves to bridge theoretical frameworks with empirical insights (Sætre & Van De Ven, 2021). The article utilizes a deductive process to systematically analyze literature on the integration of Lean and/or kaizen with ESS. Meanwhile, an inductive approach stems from 30 interviews conducted with employees across three multinational companies. These interviews are structured into two phases: firstly, analyzing current improvement suggestion systems within the companies based on employee experiences (17 interviews) and existing literature (results from deductive process); and secondly, devising a new ESS concept that tackles existing challenges while incorporating a coaching strategy, dubbed the Disney Strategy (13 interviews). Following concept development, the ESS is further refined through modeling and prototyping, employing a co-design methodology.

Table 1 demonstrates the 4 most specific objectives, together with the methods used for each one, to culminate in what is the overarching objective, which is the ESS concept geared towards the human challenges of I4.0

The techniques and methods adopted for each objective will be detailed below.

2.2. Data Collection and Data Analysis Methods

The deductive process in this paper involved a systematic literature review. To find the most relevant scientific documents for realizing objective number 1, the scientific databases Scopus and Web of Science were used, following the search formula shown in Table 2.

The research utilized the PRISMA method (Figure 2), incorporating a final selection of 30 articles for content analysis.

Objectives	Method
1. Systematic analysis of ESS systems considering Lean, contributing to the characterization of ESS with a Japanese approach and ESS with an American approach	Systematic Literature Review
2. Characterization of the ESS of the three organizations and characterization of them considering the Japanese and American approaches from the literature	17 out of 30 Unstructured Interviews
3. Definition of a new concept of an ESS capable of meeting the challenges of the participating companies, aligning at the same time with the human challenges of Industry 4.0	13 out of 30 Unstructured interviews
4. Modeling and prototyping of the concept using a co-design strategy with the participating companies	Co-Design methodology

Table 1. Specific objectives and methods applied

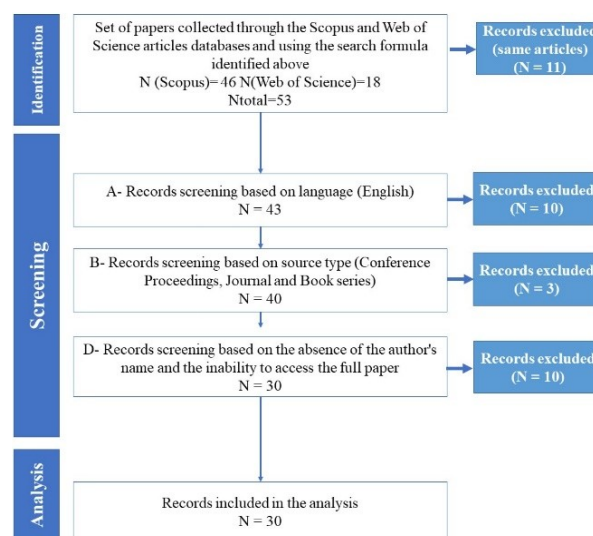| Themes	String
Suggestion Systems	("Employee Suggestion System" OR "Suggestion System" OR "Idea Management")
Lean Manufacturing and Kaizen	("Lean" OR "Kaizen" OR "Continuous Improvement")

Table 2. Search formulas

Figure 1. PRISMA method

Qualitative research perceives the world as intricate, dynamic, interdependent, and unpredictable, understood through narratives, thus casting doubt on generalizations. This approach employs texts, words, and discourses to construct concepts that aid in comprehending social phenomena within a complex array of contexts (Azungah, 2018). Consequently, to adhere to the inductive process, researchers opted for unstructured interviews as the most fitting method to achieve objectives 2 and 3.

The unstructured interviews served two primary purposes, as previously outlined. Firstly, they aimed to grasp the current state of suggestion systems within the three companies, including their implementation and weaknesses. Secondly, they sought to gather opinions from select interviewees regarding the proposed new concept. For objective number 2, 17 interviews were conducted, while for objective number 3, 13 interviews were carried out. All interviews were personally conducted by the researcher and audio-recorded with the interviewees' consent. Due to individual convenience, 23 interviews were conducted via TEAMS® communication software, while the remaining 7 took place on the interviewees' premises.

To analyze the interviews, the researchers used the content analysis method, which is widely applied to audio, visual and written files (Mayring, 2015). It is also an approach applied as an inductive methodology (Mayring, 2015).

2.2.1. The Sample

The three organizations sampled in this article are not only multinational but also exhibit a high level of maturity in Lean culture, having implemented various tools aligned with this philosophy. Moreover, they are currently in the process of integrating a digital strategy into their operations. These dual characteristics serve as crucial criteria for inclusion in this study, positioning them as pioneers in navigating the challenges associated with embracing the digital paradigm while upholding their existing Lean culture, which is deemed essential for the successful incorporation of Industry 4.0 into the corporate landscape (Salvadorinho & Teixeira, 2021b).

Company	Activity Sector	Cod.	Function Area	Age	Interview duration (min.)	Interview Phase
Company A	Chemical sector (multinational)	A1	Quality Department	30-40	30	1
		A2	Administration	30-40	45	1
		A3	Sales Department	20-30	25	1
		A4	Financial Department	40-50	30	1
		A5	Product Development Department	30-40	31	2
		A6	Planning Department	30-40	32	2
		A7	Human Resource Department	20-30	32	1
		A8	Engineering Department	30-40	36	2
		A9	Continuous Improvement Department	20-30	33	1
Company B	Metalworking sector (multinational)	B1	Human Resource Department (Agile Coach)	30-40	72	1
		B2	Human Resource Department	40-50	106	2
		B3	Quality Department	40-50	64	2
		B4	Product Development Department	40-50	54	2
		B5	Manufacturing Digitalization Department	40-50	74	2
		B6	Human Resources Department	30-40	52	2
		B7	Administration	40-50	83	2
		B8	Product Development Department	40-50	52	1
		B9	Manufacturing Digitalization Department	50-60	63	1
		B10	Product Development Department	30-40	43	2
		B11	Communication Department	30-40	45	1
Company C	Furniture and lighting retailing sector (multinational)	C1	Product Development Department	30-40	38	2
		C2	Human Resource Department	40-50	64	2
		C3	Quality Department	30-40	37	1
		C4	Administration (Supply Chain)	40-50	56	1
		C5	Continuous Improvement Department	40-50	31	1
		C6	Planning Department	30-40	48	1
		C7	Integrated Management System	40-50	38	2
		C8	IT Department	20-30	58	1
		C9	Financial Department	40-50	36	1
		C10	Engineering Department	30-40	42	1

Table 3. Sample interviews

Thirty individuals were interviewed across these three organizations, conducted in two distinct phases. 17 employees provided feedback through their respective companies' suggestion systems (Phase 1), while 13 responded to the newly introduced Employee Suggestion System (ESS) concept (Phase 2). The different phases in which each employee participated are shown in Table 3. It should also be noted that the people interviewed were selected based on two criteria: 1) Someone who participated in the creation of the improvement suggestion system; or 2) Someone who deals with the improvement suggestion system on a regular basis.

In pursuit of achieving objective 4, the co-design methodology was employed, ensuring the active involvement of users (Ind & Coates, 2013) from the inception of the new concept outlined in this study. This methodology's application commenced during the second phase of interviews, where collaborators participated in the ideation process for the novel Employee Suggestion System (ESS). Subsequently, a preliminary version of the system was developed, followed by an initial assessment of its usability. Based on the feedback garnered from this evaluation, a refined iteration of the prototype was generated, as elucidated in this paper. To carry out the modeling of the created concept, the Unified Modelling Language (UML) was applied. This notation allowed the creation of the data model (class diagram) and the modeling of interaction diagrams that aim to demonstrate how the Disney strategy is processed within the digital system. Considering prototyping, Adobe XD® software was used, due to its intuitive aspect and possibility of testing with users.

3. Results

3.1. Theoretical Perspective on the Role of Employee Suggestion Systems

This chapter aims to conduct a systematic literature review (**Objective Number 1**) with two types of analysis. The bibliometric analysis will be the first subchapter to identify the dynamics and scientific evolution of ESSs. Here, a study about the theme's evolution will be carried out over the last 20 years. The distribution of the papers by the different types of publication will also be described, and a geographical analysis will be presented to understand in which country most of the papers in this area are published. The second subchapter (divided into two subheadings) will be a content analysis to explore the relationship between ESSs and Lean and Kaizen and to identify the main characteristics of ESSs.

3.1.1. Bibliometric Analysis

According to Figure 2, between 2016 and 2020 there was the highest production of articles in this area, which refers to a total of 10 articles out of 30 that are being considered.
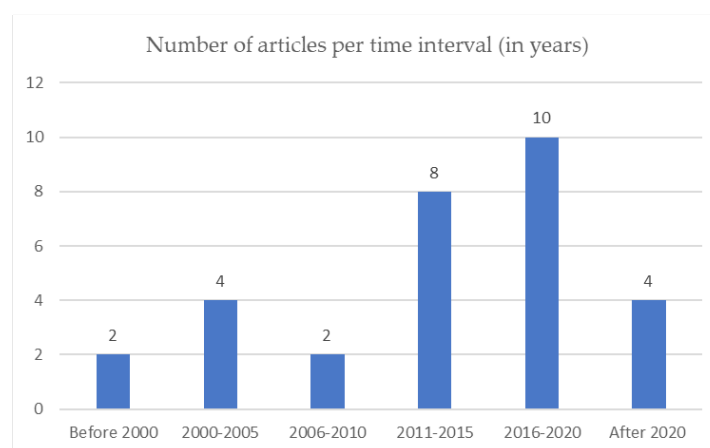

Figure 2. Number of articles published per time interval (in years)

Journal articles are in the majority relative to conference papers (Figure 3), which reveals the importance of the topic in the academic world. To reinforce this relevance comes the fact that Q1 and Q2 journals have published the most on this subject.
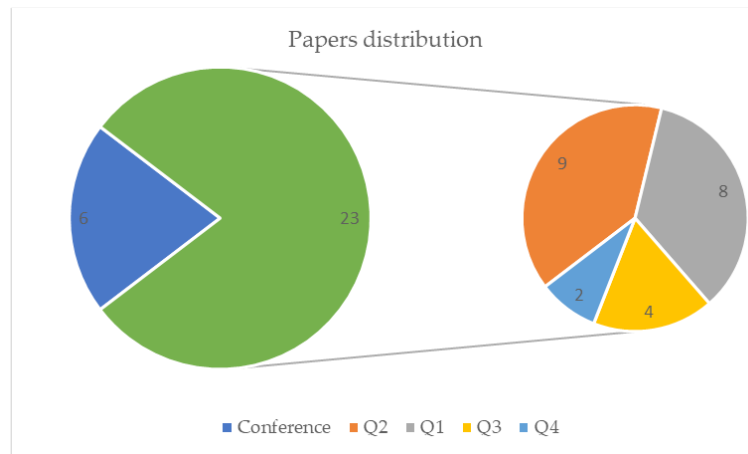
Figure 3. Papers distribution (conference and journal articles)

As far as the dispersion of articles produced on this theme worldwide is concerned, it can be seen in Figure 4 that Spain is the country where most attention has been paid.
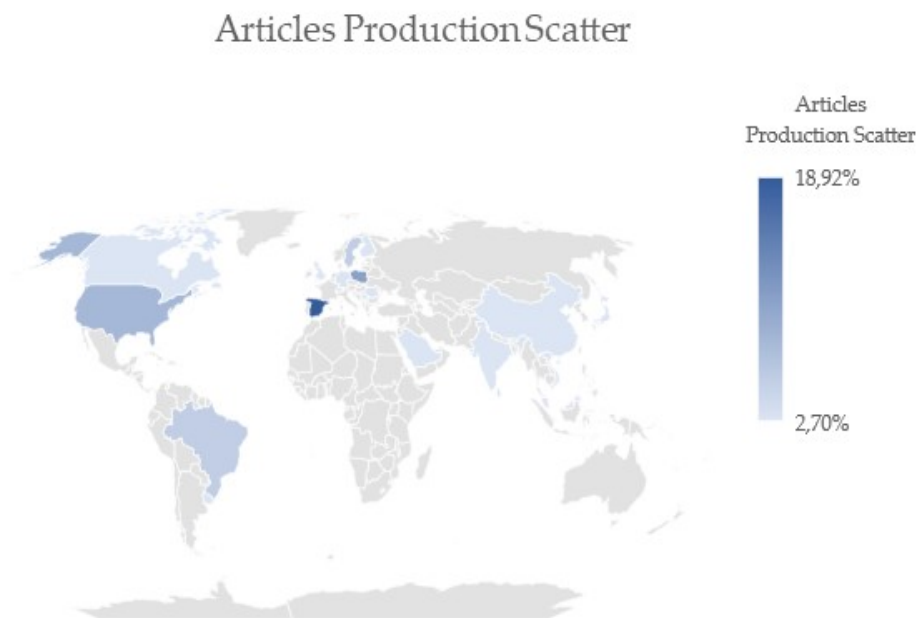

Figure 4. Articles Production Scatter (in the world)

3.1.2. Content Analysis: Employee Suggestion Systems and Lean Manufacturing

Lean Management (LM) is a philosophy that emerged in the late 1990s and has since become essential in achieving a company's competitive advantage. Its focus is on eliminating all possible waste through the improvement of internal processes and the constant involvement of employees. It should be noted that academia already admitted that the success of LM implementation is perceived by highly motivated and efficient workers at each organizational level of a company (Jing & Niu, 2015; Kagan & Krzos, 2021).

On the other hand, Kaizen is a continuous incremental improvement approach focused on all functions, systems, and processes within the company. There is no Lean without Kaizen, and the latter relies on employees' small innovations and creative ideas (the results of which are often barely visible in the short term) to increase the levels of efficiency, quality, and productivity in an organization (Berger, 1997; Janjić, Todorović & Jovanović, 2020; Recht & Wilderom, 1998).

It should be noted that so-called 'High Investment, High Involvement' workplaces have been shown to deliver the best results for workers and employers by increasing performance and improving the quality of work. This has been achieved by increasing worker autonomy and involvement and promoting training and learning (Juarez-Tarraga, Santandreu-Mascarell & Marin-Garcia, 2021; Zailani, Shaharudin & Saw, 2015).

Related to this, companies' primary goal is to compete for innovation while simultaneously stimulating it through their culture, gathering ideas, and optimizing the impact of critical experts (Fatur & Likar, 2009; Partanen & Matinlassi, 2015; Sérgio & Gonçalves, 2019).

Within the literature, it is clear the potential value that employee ideas can reflect in improving the performance of organizations. Leaders know that their employees can be a source of tacit ideas and must understand that the average person can be creative and imaginative, and this management style encourages employees to participate in the system (Dziuba & Ingaldi, 2019; García-Lorenzo & Carlos-Prado, 2003; Moica, Veres-Harea & Marian, 2019).

With lean manufacturing having already created seven types of waste at its genesis, here comes an eighth, which is based on the waste of an employee's unused potential. This waste is perhaps one of the most dangerous, as it can lead to an underestimation of people's potential and, thus, the loss of many possible ideas and concepts that could otherwise be implemented and improved (Chopra & Fernando, 2020; Kagan & Krzos, 2021; Prado-Prado, García-Arca & Fernández-González, 2020; Vagn, Clausen & Gish, 2013). The most widely used and well-known approach that aims to create value from employees' tacit ideas is the concept of Kaizen Teian, originating from the Japanese management school and mentioned in the works of the Japanese Human Relations Association (Kagan & Krzos, 2021). The benefits of this type of system include reduced costs, increased profits, better-designed waste-free processes, improved quality, better communication, reduced employee resistance to change and the proliferation of best practices throughout the organization (Chopra & Fernando, 2020).

With time and the proliferation of the system in the world, two types of suggestion systems emerged, namely the Japanese and the American approaches (Kagan & Krzos, 2021). In the Japanese method, the suggestion for an improvement system is the Kaizen Teian which is mainly interested in generating many small improvements. This type of system is characterized by a high sense of teamwork and a need to pursue excellence and assumes that every process or product improvement is worth submitting and implementing, even the smallest one (having a non-negligible influence on the processes) (Choudhury, 2000; Kagan & Krzos, 2021). On the other hand, imported suggestion systems (American style) stressed the economic benefits of suggestions and added financial incentives to them (Kagan & Krzos, 2021).

The similarity between the two approaches is that they allow suggestions submission. Apart from that, there are several differences (see Table 4). The differences found are the following (Gołaś, Mazur, Gruszka & Szafer, 2016; Kagan & Krzos, 2021; Recht & Wilderom, 1998): 1) the prominence of top management's commitment is sharper in the case of Kaizen teian, since this management is even interested in participating in workshops; 2) in Kaizen teian the number of suggestions is more important, rather than financial savings, since the focus is on increasing the morale of employees and their awareness of continuous improvement; 3) with regard to the selection, development and implementation of suggested improvements, in the American approach there is a specialized team for the purpose, on the contrary, in Kaizen teian the process tends to take less time since it is the first line supervisors who analyse and implement the suggestions; 4) kaizen teian focuses on processes and the creation of new work patterns, while American systems are mainly result-oriented; 5) kaizen teian emphases on improving the individual's own area of work, while American/western systems leave more room for suggestions on any aspect of the business, as long as it results in lower costs; 6) while kaizen teian focuses on many improvements that are inexpensive to implement, western systems encourage the pursuit of innovations; 7) in Kaizen teian everyone is forced to make suggestions and form groups with that clear objective, on the other hand western systems assume a more individualistic position; 8) finally, most kaizen teian systems do not have a reward system, while American/western systems encourage this association.

Japanese Approach (Kaizen Teian)	American Approach
Top management commitment	Top management is often unaware of the improvements (this responsibility lies mostly with middle management)
Number of suggestions is more important	Financial savings are more important
First line supervisors analyze and implement the suggestions	There is a specialized team to implement the suggestions
Focus on processes and the creation of new work patterns	Focus on results
Focus on the improvement of the individual's own area of work	Focus on the improvement of any aspect of the business if it results in lower costs
Improvements that are inexpensive to implement	Innovations
Promotes the formation of groups to submit suggestions	Assumes an individualistic approach
It does not consider a reward system	Fosters a reward system

Table 4. Differences between Japanese and American ESSs

3.1.3. Content Analysis: Employee Suggestion Systems Characteristics - the Japanese and American Approaches

Most companies have adopted the American suggestion submission system, in which employees post their suggestions through a suggestion box by filling out a paper or electronic form. Then, traditionally, once the operators have submitted the idea, they are disassociated from the process, and responsibility for implementation passes to a committee charged with selecting the proposals, setting a prize, and defining the people or groups responsible for implementation. Feedback should be quick to employees and is essential to motivate participation (Audretsch, Martínez-Fuentes & Pardo-del-Val, 2011). In their research, Partanen and Matinlassi (2015) concluded that an extensive evaluation lead time is not a problem if things keep developing and, above all, the idea's status is open and observable to employees. Therefore, the transparency of suggestion systems is vital for the people to see the ideas progress and to recognize how they could contribute to the ideation leading to innovation promotion throughout the organization (Partanen & Matinlassi, 2015).

Several authors highlight the reward system as a facilitator of continuous improvement participation programs, namely ESS. However, other authors do not consider it so clear, supporting the idea that daily process improvement is part of the employees' tasks and should be carried out without further rewards (Audretsch et al., 2011). Despite this opposition, rewards for implemented suggestions are often considered, and it is assumed that these are also important for motivation, but they need not be monetary rewards (Audretsch et al., 2011). In Marksberry et al. (2014)'s research, the importance of rewards and meaningful work in applying suggestion systems is presented and proven. Therefore, employees are more likely to engage in suggestion programs if they are rewarded, and their work is valued. These results are in line with traditional suggestion submission programs (American approach), emphasizing the importance of extrinsic rewards rather than structuring an employee's work to be meaningful. On the other hand, in Kaizen suggestion systems, the findings are different, suggesting that the organization is not aiming to motivate employees externally through monetary rewards but rather by structuring jobs that appear to be or are important and valuable from an employee's point of view (Marksberry et al., 2014).

When it comes to the issue of individual or group systems for submitting suggestions, this is also a sensitive issue. In Kaizen teian systems, employees are encouraged to submit suggestions, as mentioned in the previous chapter. However, this idea is taken to the extreme, in which employees have the right to dispose of waste they find and stop the line they are working. The consequence of this assignment of tasks is that employees can be part of the decision-making process. Thus, non-managers may be allowed to set goals and objectives in an attempt to attract or encourage participation, which in itself may contribute to management losing authority in assigning labor resources (Marksberry et al., 2014). Considering now group systems, most studies show that teamwork and collaboration are highly significant for increasing employee contribution and idea sharing. By working together, employees can more efficiently refine their suggestions by sharing perspectives while feeling socially supported in developing new and innovative ideas (Marksberry et al., 2014; Rapp & Eklund, 2007; Yokozawa, Nguyen & Tran, 2021).

According to Ostrowski and Jagodziński (2021), an ESS presents some assumptions: i)- implementation of all suggestions that add value (even if it is minor) to the organization, taking into account the resources needed for its implementation; ii)- creation of an evaluation process for suggestions before their implementation, with acceptance depending on the existence of the value it adds; iii)- creation of an organizational unit with the responsibility of promoting kaizen culture, communication with employees and evaluation of suggestions; iv)- standardization of the implementation process of suggestions so that it is binding during its economic usefulness (so that it doesn't disappear as there is turnover) and the consistency of the system in the long term is assured; v)- the suggestions should be implemented or supervised by the author (this assumption is only valid in kaizen teian systems) (García-Lorenzo, Prado & Arca, 2000); vi)- the employees should be provided with the knowledge and tools required for the effective elaboration of their own improvement projects, through training.

In addition to the previous assumptions, a set of rules based on performance management theory appear in the work of Schuring, Luijten, Schuring and Luijten (2001) and are also validated in (Lasrado, Arif & Rizvi, 2015; Marin-Garcia, Juarez-Tarraga & Santandreu-Mascarell, 2018; Rapp & Eklund, 2007): i) A system of suggestions must be created so that the person has a background on how to do, or have anything that eliminates the obstacles to doing so. This type of background can be training, simple forms and reminders that the suggestion box welcomes ideas or even help in filling out forms; ii) the tool must be based on positive reinforcement, and the same must be frequent, personalized, and not just monetary (intermittent reinforcement system can be used to avoid satiety); iii) A suggestion system should have a short lead time, where feedback is fast; iv) A suggestion system must be certain (predictable) in its effects, being able to use quantitative data and monitoring of KPIs for this; v) this type of system must avoid punishing the behavior that generates ideas, i.e. the rejection of improvement ideas cannot be perceived as a punishment; vi) Reinforcement should not be combined with setting new goals; vii) Internal competitions should be avoided (only if they are short, with small prizes and lots of fun) and viii) the tangible reinforcement should not be too great to prevent satiety (related to the dopamine release cycle in the system human).

It should be noted that visual management (VM) tools are supported in the continuous improvement literature. This is due to the ability of these types of tools to demonstrate benefits in communication and standardization that strongly impact the effectiveness of improvement systems (Jaca, Viles, Jurburg & Tanco, 2014). Kaizen storyboards, diagrams and other visual aids can encourage user participation in continuous improvement systems, facilitating while speeding up the improvement process (Charron-Latour, Bassetto & Pourmonet, 2017; Jaca et al., 2014).

In the research conducted by Jaca et al. (2014), it was concluded that there are significant differences between the implementation of VM Tools and the degree of implementation of participation systems for continuous improvement. Here companies with a higher level of implementation of their participation systems also have a higher implementation of VM. Furthermore, VM implementation for quality control, indicators and process visibility perspectives scored the lowest in companies with no or very poor implementation of participation systems. Given these three vectors, the following can be explained: a) concerning quality control, it is almost impossible to control (and improve) something we cannot measure and see, so visual quality controls and indicators are essential; b) making the process more visible and displaying appropriate information about the company's performance on the shop floor (for example through indicators) helps to promote constant innovation, commitment and responsiveness of all employees, encouraging them to contribute in the company's continuous improvement programs.

The term open innovation is already a buzzword and is based on the concept of crowdsourcing, which aims to build collaborative networks to generate ideas. Using this knowledge external to the company allows innovation to occur collaboratively and openly. Multinationals such as Dell®, Starbucks®, Cisco®, Canonical®, and Repsol have already invested in this Idea Management process based on the Open Innovation paradigm, which has given them a competitive advantage in the market (Sérgio & Gonçalves, 2017).

Overall, the advantages associated with these systems generate agreement among researchers. These benefits are: a) employees feel as part of the company since they have the opportunity to contribute and participate (Charron-Latour et al., 2017; Moica et al., 2019); b) there is an improvement in the product quality and the working

environment (Moica et al., 2019); c) there is an enhancement in customer satisfaction (Lasrado et al., 2015) and d) there is an increase in revenue (Moica et al., 2019). Moica et al. (2019) conducted a study for a period of 9 years to analyze the impact of the suggestions system. For that, key production indicators such as total revenue, productivity, number of improvement ideas, investment, benefit and profit per improvement implemented idea were monitored. The final analysis displayed a close correlation between the number of ideas and productivity and a moderate, but still existing, correlation between the total revenue and the number of ideas.

3.2. Practical Perspective on the Role of Employee Suggestion Systems

This chapter aims to achieve **objectives number 2 and 3**, now analyzing ESSs from a practical perspective, using three industrial contexts (Table 5 shows companies description) where they are applied. Thus, this chapter is divided into two phases using interviews, where in a first phase it is intended to analyze how these systems are applied in practice and in a second phase, all the knowledge behind is aggregated and thus developed the new concept of the ESS platform, called DisneyHint.

Company	Company A (Multinational)	Company B (Multinational)	Company C (Multinational)
Industry sector	Chemical	Metalmechanics	Wooden furniture for other purposes – manufacturers
Size	~400 collaborators	~1300 collaborators	~1600 collaborators
Company age	>60 years	>35 years	>10 years
Company location	Portugal	Portugal	Portugal
Level of automation	Medium labor intensive	Medium labor intensive	Medium labor intensive
Level of lean implementation	Mature	Mature	Mature
No. of interviews participants	9	11	10

Table 5. Companies summary

3.2.1. Characterization of Companies Current ESSs

Company A's ESS is an already digitalized system where suggestions are introduced by employees using a form (and the same suggestion may have several contributors) and are later subject to a filter by someone in charge. This person, every month, takes 4 or 5 suggestions to the administration so that the viability of their implementation is evaluated, according to the company administrator (A2).

"The routine that we have here is that the person responsible takes to the administration four or five ideas each month that are either of high potential or interesting from the conceptual point of view of implementation. It is up to the administration to make this reading and see if it makes sense." (A2)

One of the biggest problems encountered is the lack of visibility when it comes to the status of the suggestion, and there is often no justification for rejection (A9, A4). Besides this, the idea was highlighted that it would be interesting to follow up not only on individual suggestions but also on the suggestions of peers.

"What do I think is missing here a little bit? The involvement of people in the sense that I give an idea and then the idea stays there. And I think that people, that is, not only I, should be able to accompany the evolution of the idea and be more detailed about what was done, what was done in terms of evaluation. And, on the other hand, I think it would also be interesting for the people in the sector or even in the factory itself to know the evolution of the ideas, which ideas are currently being analysed, and even to motivate people." (A9)

"In our system, you only have access to your ideas, unless you are the leader. But you only have access to your own, and many times they shut down your idea, and you are like, this can't be!" (A4)

Company B's ESS is also already a digital system, where employees fill out a form with their ideas. According to B1, in this system the user can track the status of their ideas and associated with the tool there is recognition, through

small appliances or discounts on purchases. In addition to this system, the company has already had a support system for innovation, in which when someone had a challenge that needed innovation, they asked their colleagues for help, and at the end there was a vote on the contributions, to proceed with the implementation (B8). However, this latter system lost progression and was eventually deactivated.

"It is a platform that the person submits the suggestion and says which area that suggestion will go to. (...) After that, an owner is put there and that department responsible analyses the suggestion and then the person who gave the suggestion can see the tracking of his suggestion, if it was accepted or if it is under analysis, if it was rejected, he can see why then if it was accepted, he can see when it was implemented. And then, if the suggestion is implemented, it represents a certain number of points that the person can exchange for some small appliances, like a toaster, or a dryer. Besides that, they have already added the possibility of giving points in a shopping card logic." (B1)

"We, in the past, had an innovation system that was implemented at the product development level, that when someone had a challenge that needed innovation, that is, the staff would put it in this digital tool and people would receive a notification and then go there and try to contribute. (...) In the end, the person who submitted the problem or the certain product idea had a series of contributions from colleagues there. Then I think there was a vote, and people voted for the idea they thought was the most interesting, and from there they evaluated whether there was potential to implement the idea or not." (B8)

Company C is the one that presents the most archaic system because the whole process is by paper and is applied only on the factory floor. According to C6, briefly, employees have a workstation (which is nothing more than a piece of furniture) where they have papers that they can fill with suggestions, and then they must put them in the square they are going to (square specified on the workstation). Someone is responsible for passing and collecting the papers to the area where they are going. The biggest complaint is that suggestions take a long time to be analysed, and often they are lost track of. Thus, C3 recognizes that having the system more visual and accessible to all would be essential. At a central level (being a multinational company), based on C8 answers, they also have a best practices platform, where several companies from other parts of the world (but that belong to the same group) can share tools or even challenges that have happened, fostering collaboration.

"Each area has a workstation, people write the suggestion and manage to somehow understand if that suggestion, for example, if it is a security suggestion, people are able to know if the security technician, has seen it or not because in part this exists, but in a more traditional way, which is a suggestion on paper that stays on the board and then someone sees it and passes the information. So, I think translating it in a more visual way that ends up being easily accessible to all areas simply simplifies the sharing." (C6)

"With this form, sometimes it gets forgotten there. Maybe if it was something that everyone had access to, it would be beneficial. And I had an idea, I would send it to a system and it might even be rejected, but if there was a fee, we can say now it can't be done or it takes a lot of money to do it, but at least have an answer." (C3)

"At the central level we have a best practices platform or something like that where, for example, if I have had a good idea or if we have done something of value that can be shared with other organizations, or with others in the factories, we can do it." (C8)

Table 6 summarizes the main characteristics of the companies' ESSs in relation to the Japanese and American approaches found on literature. It can thus be concluded that both Company A and Company B have mixed approaches (Japanese and American) and Company C is more American (considering the information obtained by the company).

	ESS Company A	ESS Company B	ESS Company C
Japanese Approach	Top management commitment	Groups to submit suggestions	-
American Approach	Reward system Focus on lower costs Specialized team to implement the suggestions Assumes an individualistic approach	Reward system Focus on lower costs Specialized team to implement the suggestions	Reward system Focus on lower costs Specialized team to implement the suggestions Assumes an individualistic approach

Table 6. Characterization of ESS concerning Japanese and American approaches

3.2.2. The New ESS Concept: DisneyHint

Considering all the outputs taken from both the SLR and the interview analysis, a new concept emerges uniting the Japanese approach with the American ESS approach.

In this way, the new ESS concept intends to fill some of the gaps presented in the three different industrial contexts, namely:

1. Create visibility to the progress of the suggestion's status, in a PDCA (Plan-Do-Check-Act) logic, in which in this case, the statuses become "Submitted", "Under Evaluation", "In Implementation" and "Implemented" (in the employee's view there is one more which is the "To answer");

2. Create transparency to the suggestions submitted, so that everyone in the company can view and comment, building increasingly superior versions;

3. Incorporation of a Neurolinguistic Programming strategy (Disney Strategy), widely applied in Coaching that helps the creative/innovative process (American approach);

4. Use of the Disney Strategy to promote the submission of group suggestions, so that the idea matures enough before being evaluated (Japanese Approach);

5. Constitution of an evaluation process that admits a committee;

6. Creation of a gamification system to support interactions with the technological tool and enhance employee engagement (reward system related to the American approach).

The creativity process recognized by Neurolinguistic Programming and applied in Coaching is called the Disney Strategy (Dilts & DeLozier, 2000). This strategy divides the creative process into three phases. The first is shown as the Dreamer phase, in which the person has the idea and must indicate (in a positive way) the parameters of that idea. In addition, you should also check which results/improvements the idea will generate. The second phase is Realist, where the person is supposed to think about the steps to follow for the idea to come true, thus establishing objectives and goals for the whole process. In the end, it is the Critic phase where the person distances himself from the previous two phases, determining what can go wrong, thus checking if the whole process is ecological.

In general, all the elaborated requirements were well received, especially the introduction of the Disney strategy. Here, employees recognize the importance of maturing the suggestions before their submission and that, for this very reason, exchanging different perspectives, as a group, this objective is more easily achieved (B2, B10).

"Ok, I think it makes a lot of sense, because nowadays what happens is that you have an idea and with enthusiasm, you are writing the idea and you don't even think very well about all the implications and sometimes you don't have enough information to understand if that will be useful or not in the organization. Therefore, I think it is very good to have a slightly higher criterion here when we send a suggestion." (B2)

"I think it's really cool and I think it's a way to not let the suggestion get lost in limbo. A sieve passes there, one more motivated to do it and the other more motivated to deconstruct it and pass all the sieves, I will not say that it is bulletproof at the outset, but it already has a vest there, at least to be shown later the organization. I think it's really cool and I think, above all, that this plan of involving people creates space for the suggestion to evolve over time, which is something that doesn't happen right now" (B10)

At first, it was thought that the choice of Realist and Critic would be made by the Dreamer, but during the interviews and based on B6, it was realized that it would be better to make this process random (even within the area to which the suggestion would be directed). This change results from an attempt to reduce the possibility of close people choosing each other.

"I like the idea; I was just here thinking about the operation or the operability of what is going to happen. Well, I think it's preferable that it be random, it can be a completely different person than being a director and the critic can also be a completely different person." (B6)

As for the gamification process and the possibility of commenting on the suggestions of others, it was also considered important to create rules that determine the reduction of points (B7). This arises so that fruitless discussions are not created within the platform.

"I like the idea if you accompany a gamification system in which there is a decrease in points depending on some actions so that people do not comment just because." (B7)

3.3. DisneyHint Modelling and Prototyping

This chapter intends to fulfil **objective number 4**, materializing the concept elaborated by the previous steps of an ESS that integrates a Neurolinguistic Programming strategy applied in Coaching. Thus, the chapter is divided into two subchapters, the first focusing on the back end and the second focusing on the front-end of the conceptualized ESS. The back end was modelled through UML, passing through the class diagram that aims to be the data repository and ending in interaction diagrams that demonstrate more concretely the connection of the functionalities with the database. The front-end was designed and prototyped using Adobe XD®.

3.3.1. DisneyHint Back-End: ER and Interaction Diagrams

This section will present the Entity-Relationship (ER) Diagram that supports the DisneyHint application and the gamification applied to the interactions.

Figure 5 shows the ER diagram that supports the suggestions' workflow.
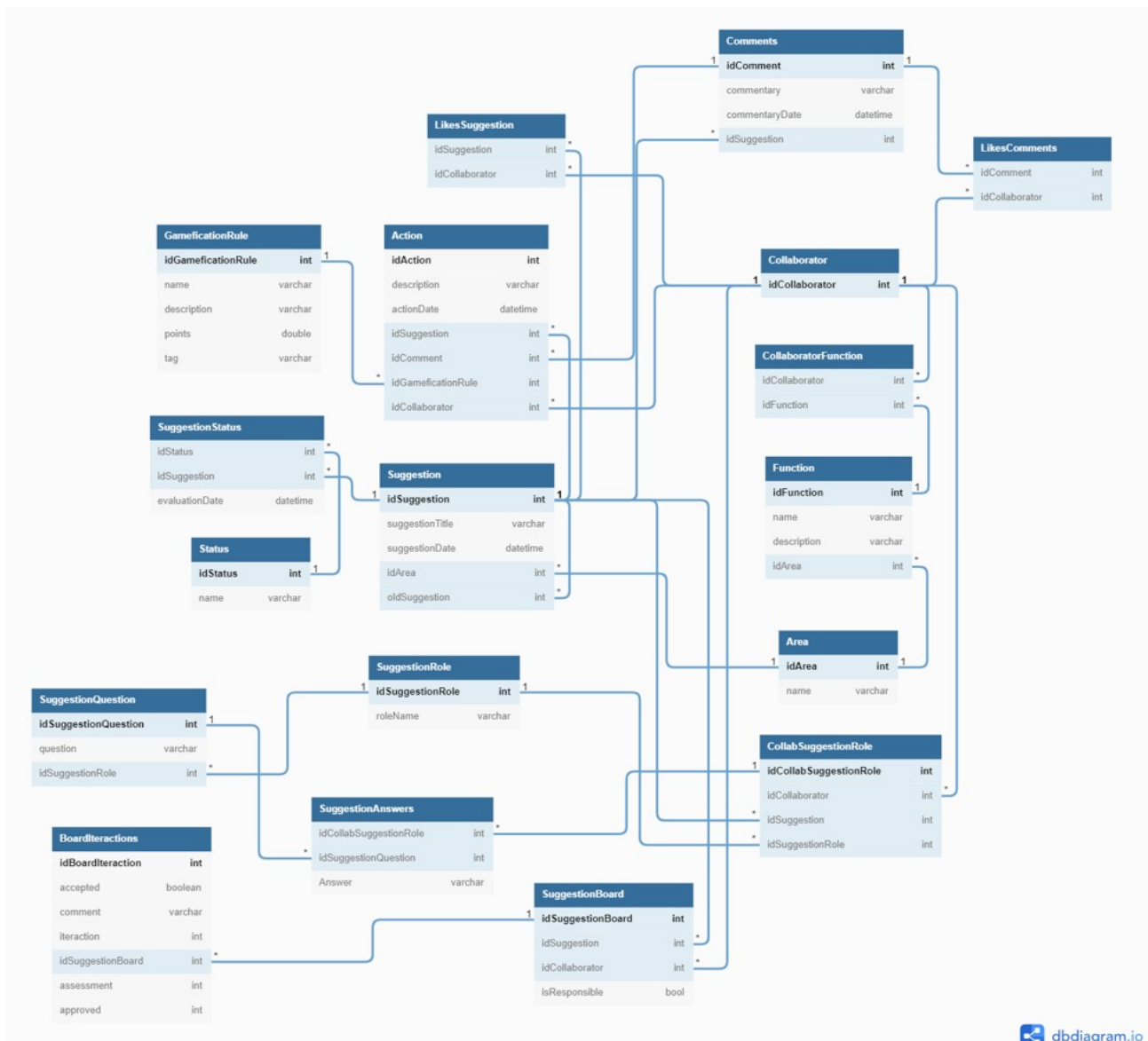
Figure 5. ER Diagram for suggestions and gamification system

Tables "Status", "SuggestionRole", and "SuggestionQuestion" are the tables that are filled with data before any interaction with the system. "Status" is the table that contains the different suggestions' status, which are No evaluation, Canceled, Under assessment, Refused, Under implementation and Implemented.

The "SuggestionRole" table will contain the names "Dreamer", "Realist", and "Critic", and each of these roles will have a group of questions pre-conceived ("SuggestionQuestion"). When the employee adds a suggestion a pre-evaluation group will be created to understand the validity of the suggestion. To store the members of the group, there is a table called "Pre-Assessment", which stores the identifier of the employee and the suggestion and the response of each member. When submitting the suggestion, the Dreamer must answer pre-defined questions. This is a process that the Realist and the Critic repeat with their respective questions. These questions are stored in "SuggestionQuestion" and differ depending on the user's role. The answers will be stored in "SuggestionAnswers" and linked to each collaborator role ("ColabSuggestionRole"). The "Suggestion" table will store some metadata information about the suggestion, and "SuggestionStatus" will store the history about the suggestion status.

The table "EvaluationCommittee" will store the collaborators that will be part of the committee and is linked to the table "CommitteeInteractions". The committee will have some interactions to decide if the suggestion should be approved. These interactions will be further explained with an interaction diagram. The collaborator responsible for the committee will decide whether the suggestion will be accepted regarding the last two evaluations. This collaborator will have in the table "SuggestionBoard" the field "responsible" as true.

The system will allow interactions between collaborators, such as comments and likes in comments and suggestions (table "Comments" will store the comments and tables "LikeSuggestion" and "LikeComments" will store the likes in suggestions and comments, respectively).

Since the system relies on a gamification framework, the tables "GamificationRule" and "Action" come up. The former will have the gamification rules with their description and points. The "Action" table will link the rules to different actions/interactions.

The following diagram (Figure 6) is the interaction diagram that demonstrates the interactions between users and the application to add suggestions. This case is from the point of view of the Dreamer, the Realist and the Critic. Figure 7 shows that the application is divided into four different structures. The user and evaluators will interact directly with the website, and the interactions lead to communication between the website and the Application Programming Interface (API) to get information.

The diagram has no actor for the Realist and Critic because the interaction they will perform is similar to the Dreamer.

When the collaborator accesses the add suggestions page, the website gets the questions he/she needs to answer. The user that adds the suggestion will always have the role of Dreamer.

After obtaining the questions, the Dreamer will answer, and these answers will be sent to the API, triggering several interactions with the database. It starts by adding a suggestion to the table "Suggestions" and adds the collaborator to the table "CollabSuggestionRole" with the role of Dreamer. When the suggestion is stored, the API stores the answers given by the user and will randomly choose responsible collaborators to pre-assess the suggestion. The responsible collaborators will be stored in the "PreAssessment" table, and they will be able to interact with the website and say if they like the suggestion or not. After each evaluator's answer, the API checks if it is the last one to proceed with the calculus for the following status. If the suggestion gets most of the likes, it will advance to the following status. If not is refused.

If the pre-assessment group accepts the suggestions, the API chooses two random collaborators from the same area to which the suggestion was added. The first chosen collaborator will be the Realist and the second the Critic. After the Realist and Critic are chosen, they can access the suggestion, analyze the Dreamer answers, and reply to their questions. When everyone has answered the questions, the Dreamer can access the suggestion and evaluate all the answers.

The Dreamer has two options with all the answers: submit the suggestion, update it or delete it.
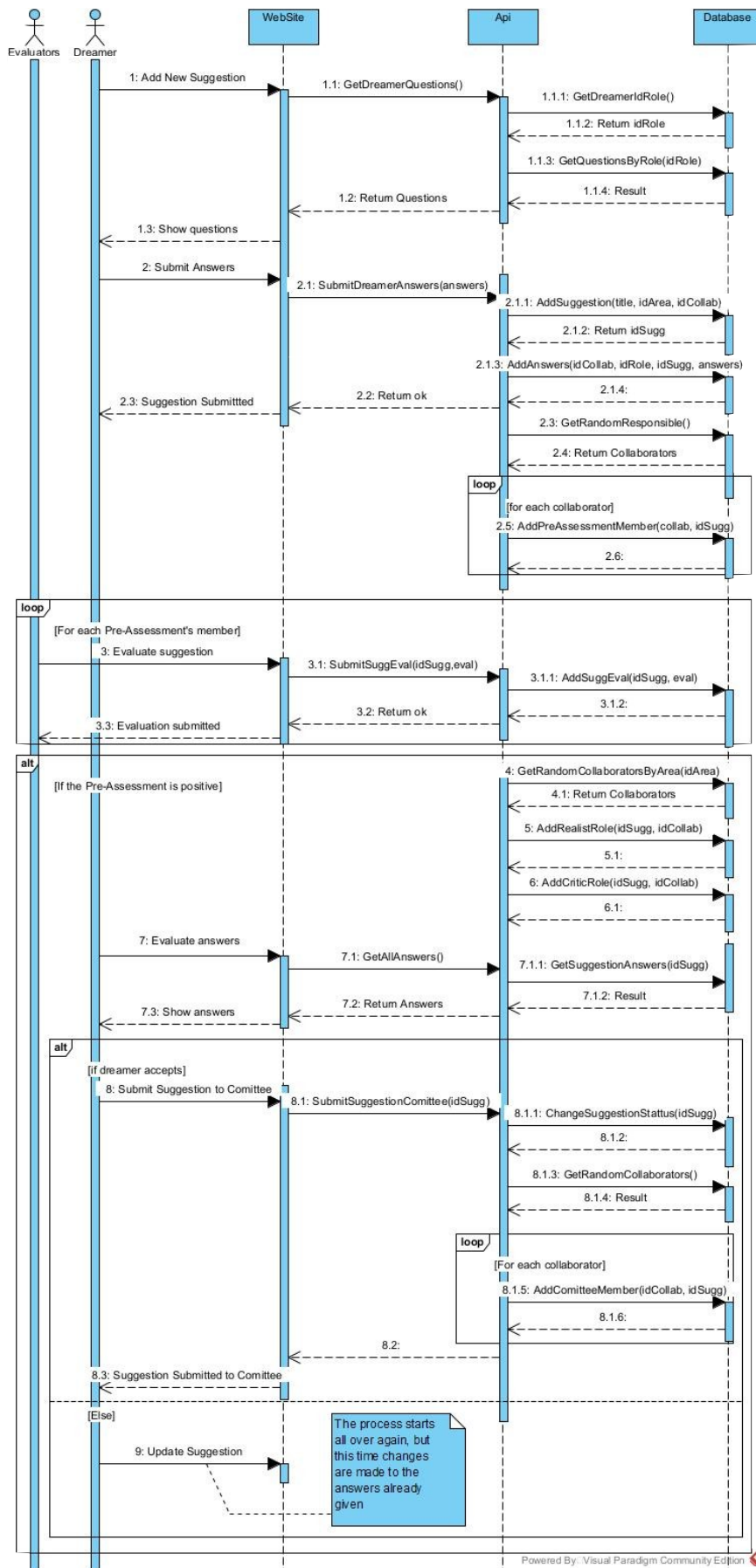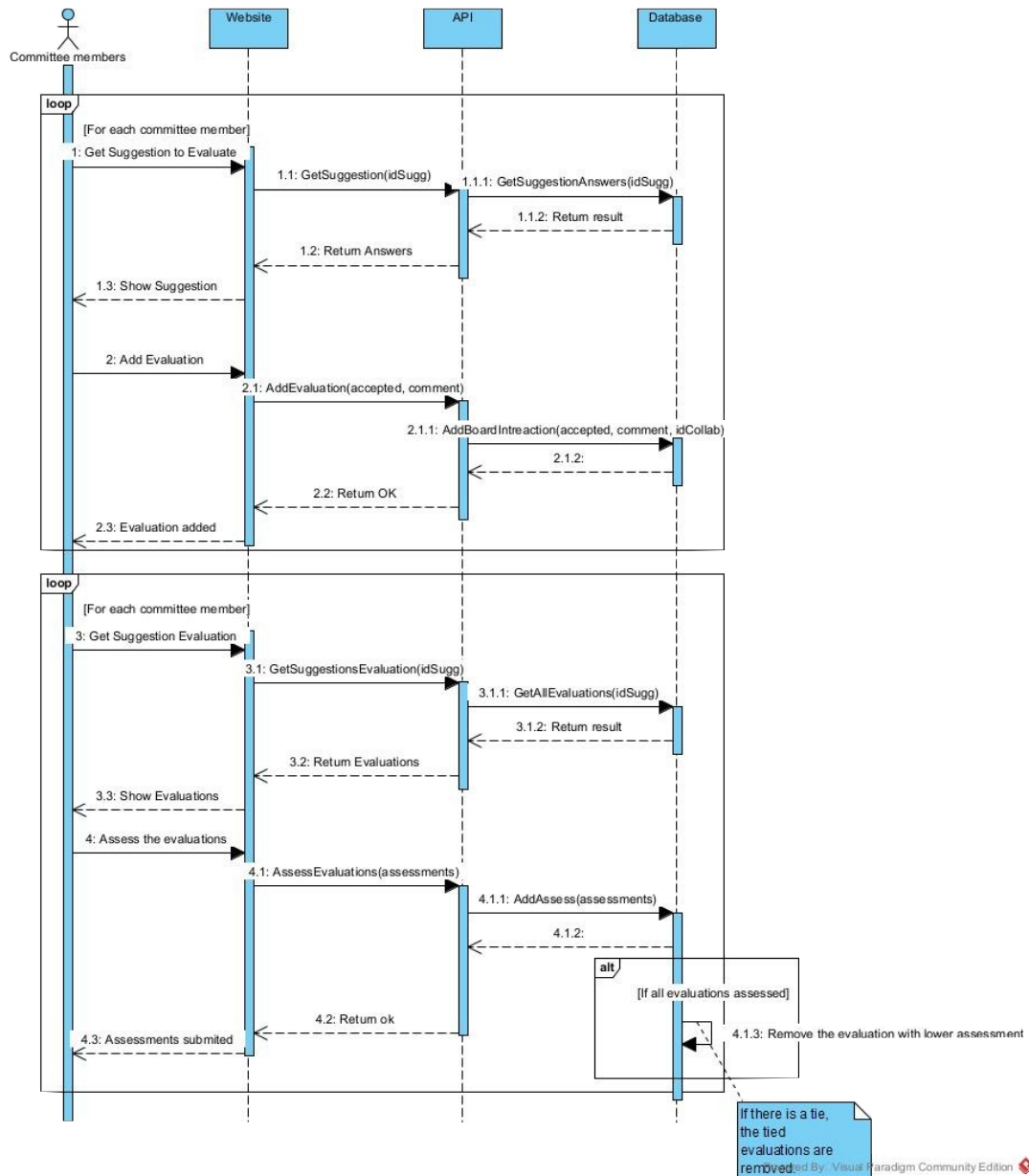
Figure 6. Interaction diagram for adding a suggestion

Figure 7. Interaction diagram for evaluation committee interactions

Figure 7 demonstrates the interaction of the committee members with the application.

When the committee is chosen, the collaborators involved will have access to the suggestion, where they can see all the questions and respective answers. After analysing the suggestion, every committee member can accept or decline the suggestion and write a comment, which will correspond to the first committee interaction. When all the committee members have submitted their suggestion evaluation, they will assess the other members' evaluation, excluding their evaluation. After completing the evaluation assessment, the database will start a trigger that will exclude the evaluation with the lower assessment. The member with the evaluation excluded will not be able to submit an evaluation in the following interaction but will be able to assess the evaluations. Those who have not been excluded will be able to submit another evaluation or maintain the same. The process of assessing evaluations will be repeated until only two evaluations remain. With two evaluations, the committee responsible will decide, regarding the evaluations, if the suggestion will be implemented or denied. The evaluation assessment can lead to a draw. If there are more than three evaluations, the database excludes all the tied evaluations with the lower assessment. If there are only three remaining evaluations, there will not be more interactions, and the committee responsible will analyze three evaluations to accept or decline the suggestion.

3.3.2. DisneyHint Gamification Rules

The system presented will be prepared with a gamification system that aims to foster employee engagement (using positive reinforcement). Also, since there are rules for losing points, this system aims to minimize the use of the platform for inappropriate actions (such as improper comments). Table 7 presents the rules for the gamification system. In short, when a suggestion is submitted, points are taken away, just as when it goes to the final rating committee, to minimize the submission of worthless suggestions. If players meet all the evaluation stages, they receive enough points to cover all losses, plus the liquidity of points they receive is also important.

If the person does not go to the application at least once a week, they also lose points, and if they comment on a post and this comment is filtered by the back-office staff, they also lose points. Just commenting without deleting the comment does not offer or hold points.

Rules	Number of Points
Dreamer submits the suggestion (at pre-assessment)	(-) 15 points
Suggestion is accepted at pre-assessment	(+) 5 points
Suggestion is not accepted at pre-assessment	0 points
Suggestion passes to final committee evaluation	(-) 10 points
Suggestion is not accepted by the final committee	0 points
Suggestion is accepted by the final committee	(+) 50 points
Person assigned to pre-assessment	(+) 5 points
Person assigned to the final committee	(+) 10 points
If user doesn't go at least once a week to the application	(-) 5 points
Add comment	0 points
If comment is blocked by back-office	(-) 20 points

Table 7. DisneyHint gamification rules

3.3.3. DisneyHint Front-End: The Prototype

The prototype created aims to solve all the problems listed in the 3.2.2 section, thus determining a more visual platform where employees can see suggestions from all members of the organization, as well as monitor their status. To make this visualization and monitoring more visual, a logic already widely used on the shop floor was used, namely the PDCA cycle (Plan, Do, Check and Act). This cycle is currently used in Kaizen boards (Juarez-Tarraga et al., 2021), where it is possible to track the corrective and/or improvement actions being implemented, often within the framework of daily Kaizen meetings. Figure 8 shows the interface for viewing and monitoring all suggestions in the company, and Figure 9 shows the interface for following up against user suggestions. As mentioned before, the Plan-Do-Check-Act frame has been changed to "Submitted", "Under Evaluation", "Under Implementation", and "Implemented" (within the employee view of their suggestions, there is one more, which is "To Answer").

As previously explained, the Disney strategy was aggregated to the technological tool. However, it is important to mention that this method can be carried out individually or in groups. It was decided to apply the strategy in a group way, where the person who has the idea (Dreamer) begins the process with a set of guided questions and then, randomly, people from the area to which the suggestion will be directed are selected to play the roles of Realist and Critic. It should be noted that this decision was based on the literature and the interviews. The literature supports that in a group, it is easier to see different perspectives, consequently maturing the suggestions more, and in the interviews, this view was supported, as can be seen in the 3.2.2 section. When the Dreamer fills in the suggestion, the suggestion is first evaluated by five or more people to which the suggestion will be directed. After validation, the Realist and the Critic are randomly selected. These two people will be randomly designated to minimise preferential choice of friendships for these tasks. So, these people receive the Dreamer's

idea in the "Reply" box (see Figures 10, 11 and 12) and must proceed to answer the questions that guide to the second and third phases of the Disney strategy. After answering by these two entities, the Dreamer checks all the answers and can still negotiate the answers with the Realist and the Critic or simply proceed with the final submission. Upon this submission, the suggestion is visible to everyone, and other people can add comments or "like" any suggestion to create the opportunity for improvement through other contributions, thus creating positive reinforcement.
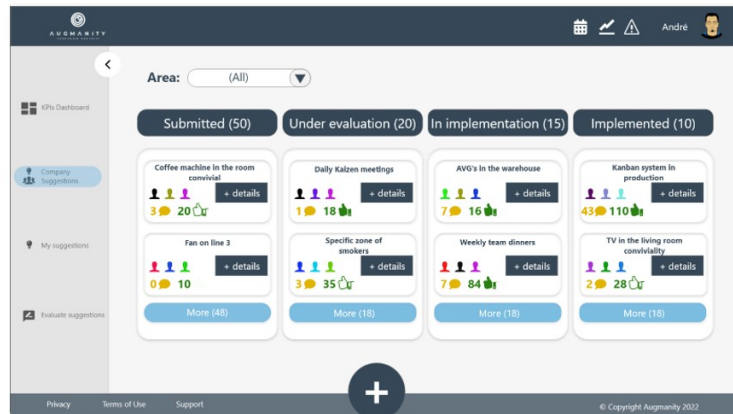
Figure 8. Company suggestions interface
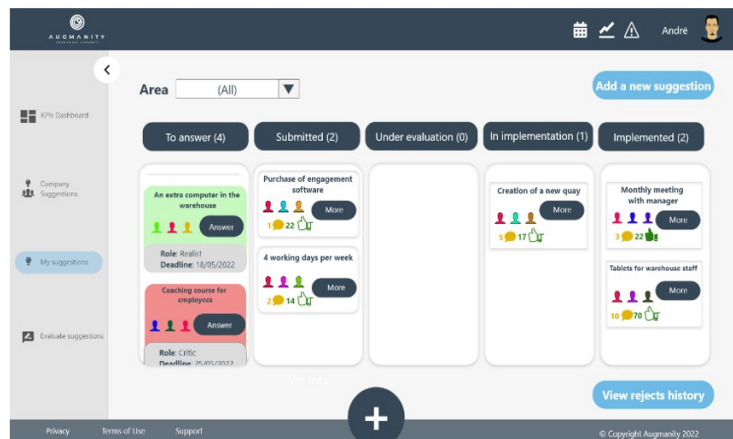
Figure 9. Employee suggestions interface
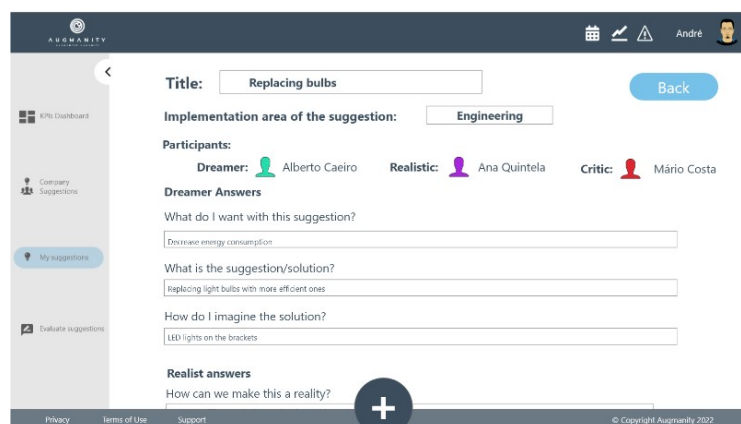
Figure 10. Disney strategy application (Part I)
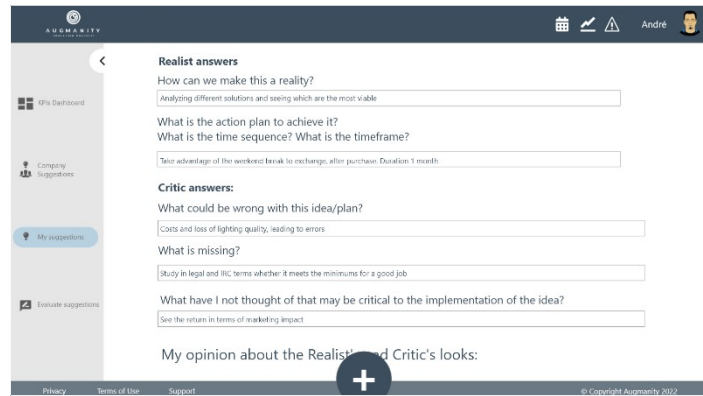
Figure 11. Disney strategy application (Part II)
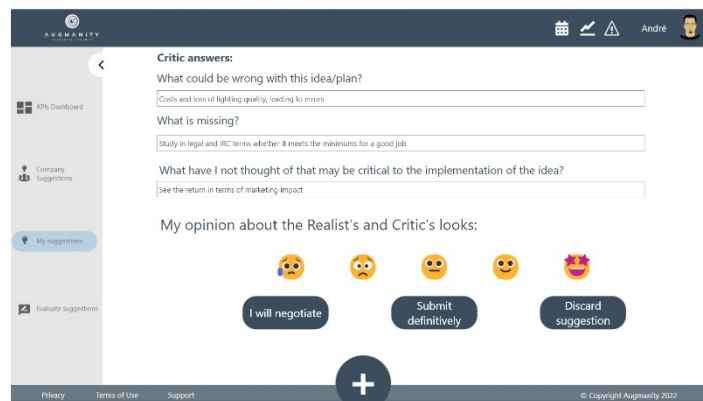
Figure 12. Disney strategy application (Part III)

After the final submission by Dreamer, an evaluation committee receives the suggestion and proceeds to evaluate it. This committee has access in the side menu to a tab "Evaluate suggestions", where they can see the status of the suggestions in the different stages of the evaluation. The evaluation process starts by reading the answers of the different entities (Dreamer, Realist and Critic), then the evaluator must accept or not the implementation and comment with feedback justifying this acceptance or not (see Figures 13 and 14). Afterwards, there is a round where the evaluators vote, ordering the different answers of all (except their own) (see Figure 15). At this stage, the tool should automatically place the answers according to the number of votes, eliminating the last one. Next, everyone is again given a chance to change their comment (if there are still oppositions to the implementation), returning to the sorting of everyone's answers until enough iterations pass to obtain a single common answer.
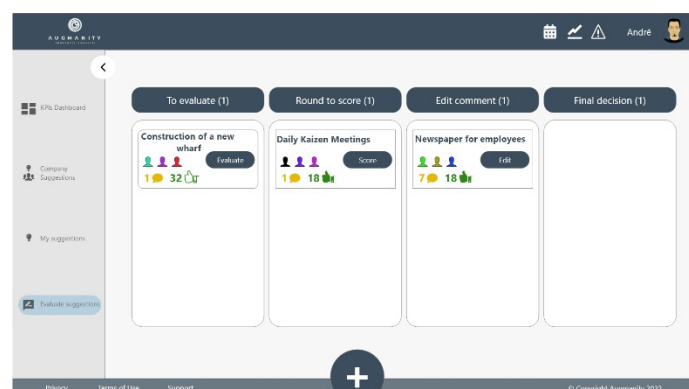
Figure 13. Evaluation committee dashboard interface

Figure 14. Suggestion evaluation interface ("To evaluate")

Figure 15. Suggestion evaluation interface ("Round to score")

Some interactions with the system will give points to the collaborators involved and contribute to the gamification system explained in the previous section.

3.4. Discussion

Employee Suggestion Systems are excellent means of collecting ideas from employees, ensuring that tacit knowledge is applied to increase the organization's levels of innovation (Chopra & Fernando, 2020; Kagan & Krzos, 2021; Marksberry et al., 2014). These systems are one of the participatory design strategies, an essential element in creating workforce engagement (Albrecht, Bakker, Gruman & Macey, 2014; Kaasinen et al., 2020; Lithoxoidou, Doumpoulakis, Tsakiris, Krinidis, Ioannidis, Votis et al., 2017).

In the current digital paradigm, it is imperative to create practices of work engagement as well as knowledge management. The context is increasingly volatile, and it is easier for the workforce to change jobs, generating higher turnover, but higher turnover creates a loss of organizational knowledge (Salvadorinho, Teixeira, Santos & Ferreira, 2021).

The Employee Suggestion System created proves to be a mixture of the two approaches, Japanese and American, tumbling more towards the American. On the one hand, this system fosters team spirit, encouraging employees to help each other find solutions for improvements through the Disney Strategy, which supports the Kaizen Teian approach (Kagan & Krzos, 2021). On the other hand, this system fosters innovation (the Disney Strategy helps the maturity of innovative ideas), is results-oriented, welcomes suggestions for any area (not just the workplace), and is supported by a gamification system, which aims to reward. All these requirements of an ESS follow the American approach (Golaś et al., 2016; Kagan & Krzos, 2021; Recht & Wilderom, 1998).

Considering also the performance management theory and the requirements presented, the platform aims to carry out some of the considerations, namely: (a) the tool presents positive reinforcement through the gamification system, where the non-acceptance of a suggestion does not turn out to be a punishment, and the constant

interaction brings the reward of points (which can then be used by the company for rankings and awarding of prizes); b) This reinforcement does not have high values, so that it doesn't generate satiety for the users, but it is a balanced reinforcement, where there are also interactions that take points away; c) the system has a dashboard, so there is KPI monitoring, and d) the creation of lanes for visualization of the status of suggestions (following the PDCA cycle in an adapted way) contributes for the feedback to be more readily received. The only point of this theory that is not being considered is that internal competition should not be encouraged, but in the gamification context, this rule does not tend to be considered since this approach is applied in game mode.

Given the existing systems in organizations, this is a platform that brings more maturity to the suggestions made (through the Disney strategy), greater visibility of their status, greater ease in their evaluation, and, above all, promotes workforce engagement (through the fostering of voice behavior) and groupthink. At the same time, it is a platform that supports the collection of employees' tacit ideas to increasingly structure organizational knowledge, making it more cohesive, innovative and, consequently, a source of competitive advantage.

3.5. Conclusions

This paper brings from theoretical considerations three major outputs. In the first step, a content analysis of the state-of-the-art about ESSs is referred to here, and thus two major approaches are faced, the Japanese ESS and the American/Western ESS. In the second phase, three themes are unified, these being Lean, Digitalization and Coaching. This paper presents the digitalization of a suggestion system that, as a concept, was born in Lean (Kaizen Teian) and is implemented in most organizations, with some divergences. This digitalization procedure was supported by the addition of a strategy that promotes a sustained innovation process called the Disney Strategy. In the area of Coaching, this is a method applied when setting goals and applying ideas. Its use focuses on the structuring of thought so that the human tendency to set limits is lightened. Most companies rely on Lean tools and processes, which must be considered when implementing a digital strategy. In a context where most industrial contexts seek competitive advantage through technology introduction, it is imperative to ensure what already exists and preferably improve upon it. This paper comes, in fact, to create a concept capable of being adapted to the current industrial context, preserving Lean while associating technology and bringing the focus to the human being through the Disney strategy. As a third output and considering the Great Resignation phenomenon, it is important not only to retain the workforce so that the organizational knowledge is not threatened but also to create this knowledge. Thus, this paper brings awareness that an employee suggestion system is a determinant in capturing tacit knowledge (which is in the minds of employees), turning it into explicit knowledge, thus contributing to organizational innovation and consequent competitive advantage.

In terms of practical contributions, this paper displays a prototype and the modelling of an employee suggestion system focused on the sustained innovation process. It also brings together a concept of an ESS that unites the Japanese and American approaches. On the one hand and following the Kaizen Teian tradition, this is a concept that fosters groupthink. On the other hand, this time, following the American drift, this is a system that fosters innovative thinking that relies on a rewards strategy (through gamification). Here, employees can make suggestions about everything in the company. It should be noted that this is a concept that was co-created with three industrial contexts and, therefore, besides literature validation, it brings practical validation of the real world.

In such a volatile context, companies must focus on not only inserting technology but also aligning the digitalization strategy to the human being, the focus of Industry 5.0.

As future work, it is intended to test the platform in a real environment, using different activity contexts.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

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