

Systemic Sustainability Analysis in Small and Medium-Sized Enterprises (SMEs)



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Abstract Sustainability is rarely implemented in employee work practices in small and medium-sized enterprises (SMEs). The authors note that SMEs should implement sustainability practices as integrated part of work activities to ensure long term success. This paper describes an empirical study of SMEs sustainability on employee real work practices. A relevant perspective is offered by the triple bottom line approach (TBL) combined with sociotechnical theory. The attention to creating value for the future could lead to fewer sustainability issues. Furthermore, the analysis highlights the importance of the best use an employee knowledge and skills to ensure his satisfaction. The main issue that hinders the improvement of sustainability could be a lack of management attention to systemic integration of employee work practices. The authors argue to integrate technology and systemic perspective in TBL approach to achieve sustainability from sociotechnical perspective. The analysis aims to support enterprises to remain competitive in evolving contexts.

Keywords Systemic sustainability · Work practices · Triple bottom line · Sociotechnical approach · Contextual analysis

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1 Introduction

Over the years, sustainability has taken on a key role in companies. The importance of sustainability has been underlined for many years but certainly explicit since 1987 [1]. Sustainable development in small and medium-sized enterprises (SMEs) is intended to support present needs without compromising the ability of future company generation to meet their own needs [1]. Elkington argues the need to integrate the sustainability agenda in real work practices of enterprise through the triple bottom line approach [2]. Since then, many studies [3–6] have focused on the relevance for enterprises to pursue sustainability based on the triple bottom line approach. This approach outlines a way of thinking that concerns corporate social responsibility so that it covers not only the profit of the enterprise but is also acceptable environmentally and socially fair [2]. Triple bottom line approach goes beyond the traditional business concept of the bottom line that pursued profit as its only goal [7].

In contrast, what is crucial for sustainability in the work practices of an enterprise is collaboration between stakeholders [3]. Usually, an enterprise is not made up of a single person, but rather it is a group of people working together to achieve a common goal. The impetus for a change towards sustainability should be driven by the company at all levels of the corporate hierarchy, especially among the grassroots employees. From this perspective, the company has to be aware of its responsibilities towards different stakeholder groups [8]. This approach is intended to improve a social and ecological performance of company taking into account sociotechnical issues [8].

A Sociotechnical perspective “*provides a new worldview of what constitutes quality of working life and humanism at work. It facilitates organizational innovation [...] with an organization and technology that enhances human freedom, democracy, creativity*” [9: 262], collaboration and participation among stakeholders. A sociotechnical approach concerns the technological and human system and their environment and how they affect human behaviors [10]. This approach focuses on human and technological sustainability and how the employee interacts with sustainability in work practices.

Practically, to make a real improvement, the managers should use their knowledge to understand real problems and provide guidelines for change; while at the same time always listening and considering the advice of the employee. According to sociotechnical theory, there should be more communication and exchange of information in the form of real dialogue between employees and management. Due to difficulties of communication, the latter could be simplified through meetings or with an analyst acting as a facilitator [11]. The facilitator would make communication constant, more comfortable and more productive. In any case, those who make sustainability in practice possible are the employees.

This paper describes the results from a project that analyzes systemic sustainability in work practices which draw on a sociotechnical and a triple bottom line

approach in the SMEs. Some of the issues in the approach to systemic sustainability have been identified during the analysis of employee work practices. The main purpose of the paper is to analyze sustainable work practices of employee in SMEs with a sociotechnical approach. From the perspective of work practices, the pursuit of sustainability could be a way to achieve competitive advantages and long-term success. From a sociotechnical point of view focus on the respect of the environment, the well-being, and professionalism of employees and enterprise profit could lead to long term success. Sustainability is intended to support enterprises to reach business excellence towards competitive and in continuous evolution context. The factors that support business excellence are complex and not static [8]. From a sociotechnical perspective, over time value creation for companies is based not only on their intellectual capital and on “know-how” but also to the desire and the ability of their employees [8].

According to the agenda of industry 5.0, to be sustainable and competitive the focus should be on the relationships between employees and work systems [8]. In contrast, industry 4.0 was based on technological development and overlooked the human dimension [8]. Industry 4.0 appeared to lose the grounding that the sociotechnical perspective has traditionally provided.[8, 12]. In industry 5.0 there is a return to the importance of the sociotechnical approach, which is intended to lead to continuity and progress [12]. According to sociotechnical perspective, industry 5.0, through the support of its employee tries to reach business excellence in work practices [8]. The sociotechnical perspective is intended to lead enterprises to reach systemic sustainability.

Over the years, there has been a long interest in corporate sustainability but now it is not necessarily a choice. Since there is continuous social, cultural, economic and legislative pressure to move in a sustainability direction [13], sustainability has become mandatory thanks to European Directive 2014/95/EU [14]. The European Directive requires companies to include non-financial statements (for instance environmental matters, social and employee aspects) in their annual reports to encourage companies to develop a sustainable approach to business [15].

The next section will describe the background of the project and outlines how previous work provided the basis for the analysis. Following, in the methods section an overview of the dataset used in this analysis will be presented. The authors will then describe the initial analysis of the dataset and the way the data are studied. Finally, the second part of the analysis will be the core of the investigation, and focuses on three main areas of interest:

- Sustainability as dependent on management,
- Impact of paying attention to the future value,
- Employee satisfaction.

The paper will then discuss of the current analysis and key findings. The conclusion will provide an overview of future analysis and final thoughts.

1.1 Background

The project started in October 2018 and continued until April 2019. The engagement with each company was conducted by 40 trainee analysts. Each trainee analyst worked in a separate business. Trainee analysts interviewed a total of 148 employees. Typically, each trainee analysts would have had more than ten interviews with the same employees over this period. Each interview took approximately half an hour. Some interviews were semi-structured, and all trainee analysts completed questionnaires during interviews. In each company, a trainee analyst interviewed at least three people (3–5) who were the same three people throughout the project. In each company, the work practices of one employee are the main focus of the trainee analyst. This employee has been interviewed more often and in greater detail compared with the other two.

Sustainability analysis is only one part of the overall project. In this paper, the focus is systemic sustainability and development of the overall project based on the sociotechnical toolbox [STT]. “*STT is a collection of tools, techniques, and pragmatic methods which can be used to support organizational change*” [16: 3]. The main focus of STT is the work-system, which is the core of the organizational change [16]. This toolbox is useful to change organizational practices in order to reach business excellence [16].

The STT has approximately 30 different methods of analysis, which are divided into eight main analytical spaces [16]. Five different types of questionnaires [interaction, sociotechnical, sustainability, change-potential, information, and cybersecurity] support the methods of the analysis [16]. One of these questionnaires focused on sustainability, which is the subject of this research. The sustainability questionnaire has 24 questions divided into the following parts: economic sustainability, social sustainability and environmental sustainability.

Open and closed questions were used in the sustainability questionnaire. In addition, to add value to the research, part of the sociotechnical questionnaire was added. The reason why sections of the sociotechnical questionnaire were included was to investigate how enterprises integrate sustainability issues into work practices. In addition, it is essential to focus on how much an employee is involved and satisfied with their work. This integrated dataset intended to provide a better overview of sustainability.

1.2 Methods

The dataset collected by 40 trainee analysts is the basis of the analysis proposed in the current paper. The dataset contains all the open and closed answers of the 148 employees. This paper draws on a subset of the dataset that is focused mainly on sustainability and part of the sociotechnical questionnaire. Based on the content of the first dataset, to support the analysis, the following datasets were also created:

- The Enterprise Report. This contains the type, size, and economic activity for each company. The “NACE” standard was followed in order to connect each company to its economic activity [17].
- The Sustainability Report. This contains all the categorized answers of the employees related to and supporting sustainability.

2 Initial Analysis: The Dataset

The first step of the analysis concerns the meaning behind questions and raw data. A sustainability aspect that each question aims to uncover is the hidden meaning. The hidden meaning of each question, which aims to support the sustainability analysis was explored. Raw data are composed by open and closed response for each sustainability area. Each single question from an employee was categorized. During the categorization, most of the answers were not consistent with the questions. All open questions require explaining “how”, and in contrast, the answers focus on “who” or “what”. Only through a complete and coherent response can we understand whether the employee is involved and implements their sustainable work practices.

The following is an example of an answer given by an employee that does not address the question:

“Are you managing resources directly needed in your work? If yes how?”.

“Yes. Stock, employees and my time are some of the resources that i need to manage in my work”.

The first categorization is intended to lead to a clear vision of the true meaning of the data and their inconsistency. However, to compare businesses accurately with each other, there was a need to unify the data. Accordingly, there was the addition of the second categorization composed of the following categories and ranges:

The individual answer of an employee, based on the grade and coherence with the question, was placed in the category schema (see Table 1). To evaluate the whole business the mean percentage was calculated, based on the answers of employees from a single business. The mean percentage was calculated using the relative category range and then, by taking the middle range value of every single employee’ answer which was in turn used to place the business into the appropriate category. This percentage was placed in the appropriate range for that category (see Table 1).

Table 1 Second Categorization’ categories and percentages range

Category	Range
High	100–80
Medium–High	80–60
Medium–Low	60–40
Low	40–20
Absence	20–10

Table 2 Examples of questions that identify the problem in all sustainability areas

Sustainability Area	Problem (Example of question)
Economic	Is local budget surplus carried over to next year?
Social	Is there someone else who can do employee's job if he/she is away?
Environmental	Does the job require specific environmental considerations?

What is essential is the level of awareness and recognition of the problem. The problem is what compromises the ability of companies to meet their future needs. Examples of questions that identify the problem are below (see Table 2). If there is little or no recognition, then this is categorized as *High*. If there is significant recognition of the problem, this is categorized as *Low*. Therefore, the same previous categorization was used for the problem but in reverse. When the knowledge of the problem is high, the problem belongs to the low category and vice versa. This reverse connection is related to the company' lack of knowledge of the problems. If the company does not know that it has an economic, environmental and social problem, this could be the biggest problem for a company. In this way, all the data are uniquely placed on the same scale and can be compared for each single enterprise.

3 Second Part Analysis and Key Findings

3.1 Sustainability as Dependent on Management

Over the years, the theme of sustainability for companies has taken on a crucial role. Sustainable development is intended to meets “*the needs and aspirations of the present generation without compromising the ability of future generations to meet their needs*” [1: 292]. The triple bottom line is an approach that tries to achieve sustainability. Elkington intended to encourage a business vision based on the idea to control and coordinate economic, social and environmental value [7]. Focusing on these three aspects is a way to achieve sustainability [18] and is intended to bring value to the enterprise. The triple bottom line fits the agenda of Mumford on sociotechnical theory [9, 19, 20].

The basis of sociotechnical theory is technological and human sustainability through the attention to employees in their work practices [9]. Sustainability must be implemented in work practices, paying attention to employees and the human and technological system. Pursuing this idea, the first stage of the analysis was the identification of the level of the enterprise' attention to the future economic, environmental and social sustainability value. In this case, future value is understood as the extent to which companies are willing to meet their future needs. In other words, future value is what a company should care about for their long-term life and success. The attention to the future value is how much company support the ability to meet their future needs. Table 3 presents example of questions that identify the future value for each sustainability area (see Table 3).

Table 3 Examples of questions that identify the creation of future value in all sustainability areas

Sustainability Area	Future Value (Example of question)
Economic	Is the employee expected to keep spare financial reserves/resources?
Social	Does the employee get personal mentoring by an expert in his job?
Environmental	Does the employee get training/advice in environmentally friendly practices?

The analysis focuses on each question that aims to highlight the presence of attention to the future value presented in Table 3. Focusing on economic future value, only 22.30% of employees keep spare financial reserves/resources. This percentage underlines the low presence attention of enterprises to economic future value and, therefore, economic sustainability. The economic result seems to be low compared with the other sustainability areas. The analysis of social future value attention highlights that 47.30% of employees get personal mentoring by an expert in their job. This result underlines that most of the enterprises pay attention to social future value allowing the transfer of knowledge from an expert to a less experienced employee. Analyzing environmental future value attention, only 29.05% of the employees interviewed affirm that they get training and advice on environmentally friendly practices. Therefore, enterprises seem to do not pay enough attention to environmental future value creation.

In the investigation, none of the evidence from the dataset suggests that the enterprises interviewed achieve a maximum level of attention to future value in all sustainability areas. This lack of sustainability is the result of inadequate attention that is generally placed on the creation of future value and sustainability. All the firms that show the highest levels of sustainability, at least in two of the three areas are shown below in the graph (see Fig. 1). Only three enterprises out of forty achieved the highest level of sustainability, at least in the environmental and social area. These enterprises are different sizes (for example small, medium-sized), have different typologies (for example franchising, part of a group, department in a big organization), and different economic activities. However, sustainability does not appear to be entirely influenced by these factors.

Overall, there may be a correlation between size, typology, and economic activity. This is because depending on the typology, size and economic activity enterprises have different needs and problems to face. However, the similarities are not unequivocal, the graph below (see Fig. 2) shows that within enterprises with the same characteristics, there could be different results. Even if the enterprises “Beta”, “Gamma” and “Kappa” have the same attention level to economic sustainability, they have different attention levels to social and environmental sustainability. This result indicates that the single most important thing that can influence the sustainability of an enterprise is management.

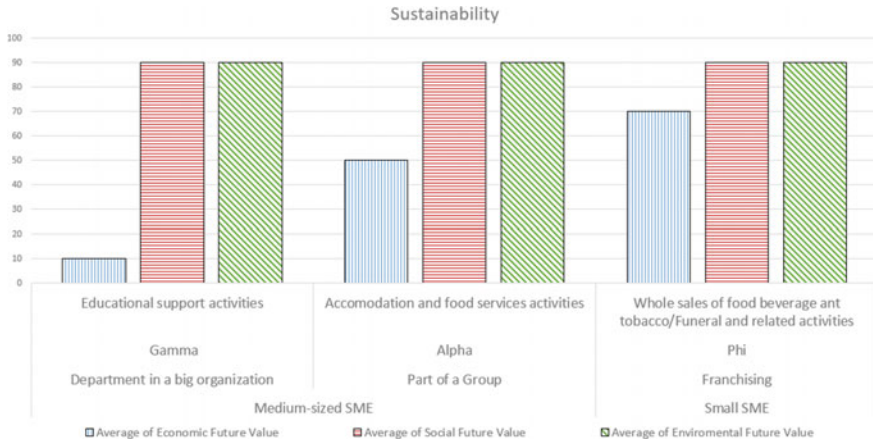


Fig. 1 Companies that show the maximum levels of attention to the creation of future value and sustainability

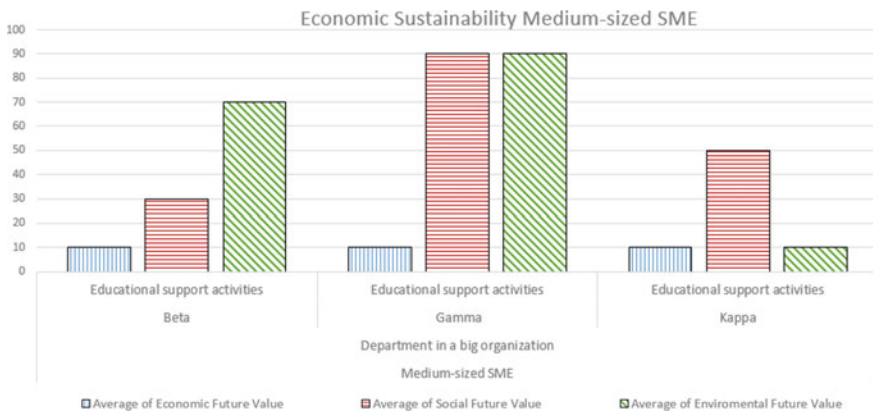


Fig. 2 Companies with the same size, typology, and economic activity have different attention levels to the creation of future value and sustainability

An overview of the levels attention companies devotes to future value creation of economic, environmental and social sustainability lead to the following considerations: the area that has achieved the highest result in terms of attention to the future value is social sustainability, with 25%. This may seem like a low result but in comparison with other areas it is the highest. Environmental and economic areas respectively are 5–10% of high attention to the future value (see Fig. 3).

In general, the expectation is that economic sustainability is the first aim pursued because it is a fundamental perceive of all economic activities. Managers tend to pursue only economic value and not future value, which leads to sustainable enterprise. The results suggest enterprises do not pay attention to the creation of surplus.

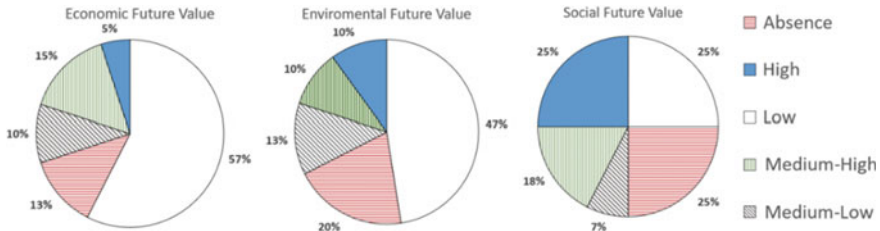


Fig. 3 Economic, environmental and social future value attention levels

This data can underline the lack of attention of managers to the future of their enterprises creating unsustainable development. The same thing happens in the environmental area. Those who manage the employees do not pay attention or raise awareness to environmentally friendly practices. An example of an employee’ answer to the question about training in environmentally friendly practices was:

“Handbook to refer to but otherwise self-taught”.

This result supports the thesis that managers are lacking in this area. Managers do not direct work practices in a human activity system that should positively influence natural resources in their future. There seems to be insufficient culture and knowledge about sustainability in practice. Managers are not ready and prepared enough to lead sustainable development of an enterprise. Managers only pay attention to results in the present, and they do not have a broader view that leads to thinking about the future sustainability of an enterprise.

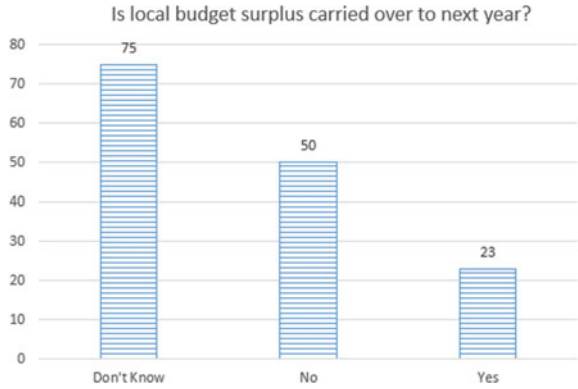
3.2 Impact of Paying Attention to the Future Value

To only focus attention on the analysis of future value (see Table 3) is reductive. Therefore, it is important to analyze the nature of the problem (see Table 2) that leads managers to pay higher or lower attention to the creation of future value.

From employee’ perspective, the problem area that presents the significant uncertainty is the economic one (see Fig. 4). More than half of the employee does not know if the budget surplus is carried over the next year. This uncertainty could highlight that employee is little involved in economic issues. Even if employees are involved in the financial decision or have their budget to manage, they do not present the knowledge of surplus.

The 33.78% of employees affirm that there is no surplus carried over the next year and, in contrast, only 15.54% affirms the contrary. This result could be the consequence of top-down managerialism approach. Managerialism approach does not include employee; therefore, there is the decontextualization of the problem and the solution. In contrast, the sociotechnical approach proposes a bottom-up approach,

Fig. 4 Uncertainty in the economic problem area



which includes the participation of employees who know how to afford the problem in practices.

Overall, the comparison of the actual problem and the attention to future value denotes that these two values are inversely proportional. When there is greater adoption of methods that focus attention on future value, the problem in that sustainability area is *low*.

The data in the figure (see Fig. 5) clearly show the inverse proportionality of the two factors. This result highlights the importance of paying attention to future value. When enterprises pay attention to future value and implement sustainable practices, they lower the problem. These practices are intended to lead to better results on all sustainability aspects. The attention to future value increases not only the prospects of the company but also its value.

The graph (see Fig. 5) does not only show this concept, for example, the case of “Delta” enterprise underlines that even if attention to future value is *medium-high*,

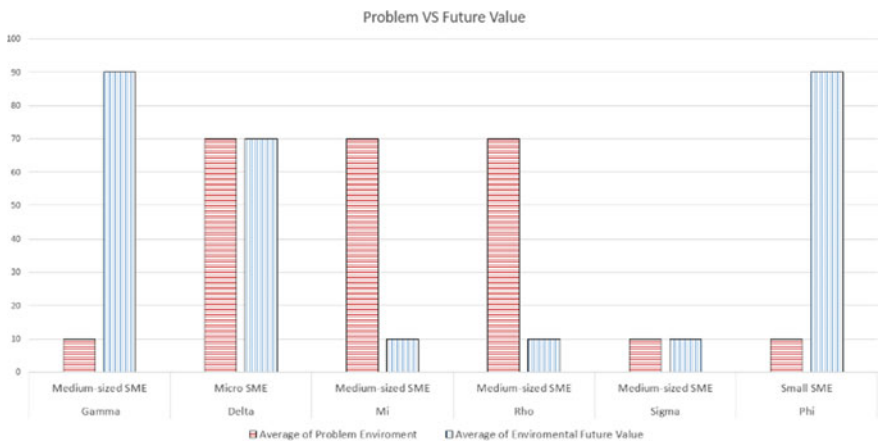


Fig. 5 Comparison between actual problem and attention to the creation of future value

the problem can remain *medium-high* and unchanged. This particular case leads us to suppose that it is not enough to pay generic attention to the problem. It is therefore essentially to pay proper attention to implementing adequate practices to solve the specific problem. In the environmental sustainability area, an example of best practice is to give employees training and advice on environmentally friendly practices. If the enterprise already implements these practices and it still has a significant problem, it should change their training methods because they may be inadequate for the context and employees.

Every problem is different because it comes from different conditions and contexts. Therefore, employee and managers together must analyze the problem, trying to understand its source and the causes. Only after they have achieved a clear vision of the problem can managers find the appropriate methodologies to solve it. Consequently, having a significant problem and high future value attention means that the management care about supporting their employees to develop sustainable practices. In this case, management is paying attention to the creation of future value but not in the right way.

Another particular case could be identified in the “Sigma” enterprise (see Fig. 5). “Sigma” enterprise has been categorized as having an *absent* problem and also categorized as having an *absent* future attention. At first, this result could lead us to thinking that the company does not have a problem and has no reason to worry about its present and its future. Even though the enterprise does not have the problem now, does not mean that it will not have in the future. Therefore, it can be assumed that an absent/low problem and a lack of attention to the creation of future value is a symptom of no interest in the future. In this context, the enterprise focuses on quantity and short-term results. This assumption leads to thinking that managers and employees have no knowledge of sustainable development and so they do not identify problem of sustainability as a real problem.

As a consequence, if managers do not prioritize the problem, it is unlikely that enterprises will achieve sustainability. In the area of social sustainability, there is a higher probability of finding this type of situation. In particular, managers tend to underestimate their employees and do not value their human value in terms of knowledge and experience. Managers do not consider the uniqueness of their employees, and they do not use their value to create competitive advantages for the future. Even if they do not have a social sustainability problem now, it can be expected that they will probably have one in the future. Therefore, if there is not inverse proportionality between the problem and attention to the future value, it is a symptom of a problem.

3.3 *Employee Satisfaction*

In the future the long-term competitive advantage depends on human sustainability, in other words, the knowledge, creativity, work ethos that human beings bring to an enterprise. The concept of human sustainability is the basis of sociotechnical theory [16, 20]. If employees voluntarily make efforts to solve work-related problems, it

is likely that the company will achieve work excellence [16]. The achievement of human sustainability can take place when the employee is able to enjoy and is satisfied with his/her work [20]. However, this condition is not only intended to benefit the employee but also the enterprise and its path to sustainability.

The general thought is that employee satisfaction only depends on economic factors. In contrast, the graph below (see Fig. 6) shows that this theory is not always valid. *“Workers want to be rewarded for their work and their contribution, but money is only one aspect (translated from Italian)”* [21]. In this context, the economic gratification refers to the economic bonus or surplus offered by the company to encourage better work from employees. What the graph (see Fig. 6) shows is that economic gratification is not the main key factor for employee’ satisfaction.

A significant factor that could influence employees’ satisfaction is the best use of their skills and knowledge. In this case, the best use of employees’ skills and knowledge refers to the managerial ability to involve and encourage employee capability. Some data shows that even if economic gratification is higher than the best use of the employee’ skills and knowledge, the level of employee satisfaction is the same as the best use of employee’ knowledge and skills. Therefore, employees can be expected to be more satisfied and motivated to work better when their skills and knowledge are used in the best way. In this context, employees will feel involved and appreciated. Managers should focus on the employees, making them feel appreciated to earn their satisfaction and as a consequence, their trust.

From sociotechnical perspective, the importance of employee satisfaction is reflected in the analytic framework to evaluate employee satisfaction developed by the research unit at the Manchester Business School [20]. The first area of interest of this study is the knowledge “fit”, where the knowledge and skills of the employee are collocated. Job satisfaction is based on the achievement of a good fit between job needs and expectations in different areas [20]. Employee satisfaction depends on multiple factors, for example task structure, ethics and efficiency [20]. Due to a lack of data, not all the multiple factors are the focus of this analysis. In this study,

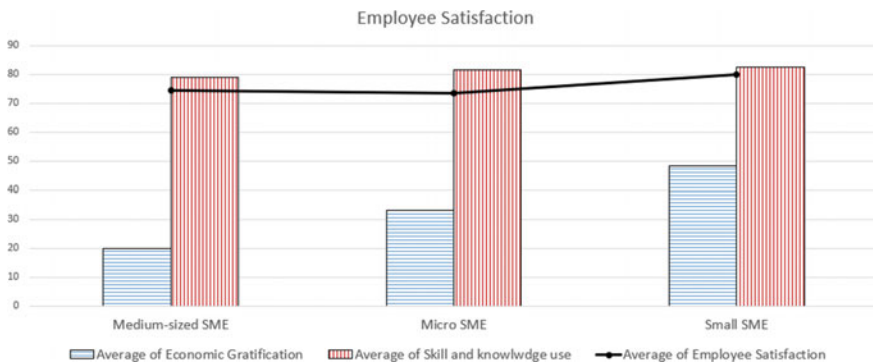


Fig. 6 Employee satisfaction compared to economic gratification and employee’ skill and knowledge use

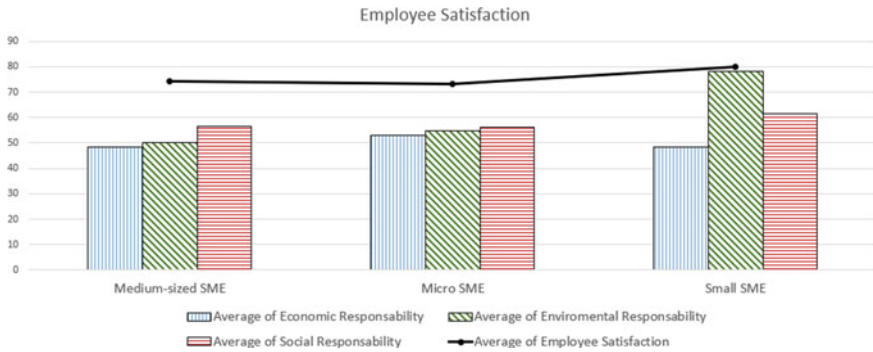


Fig. 7 Employee satisfaction compared to employee responsibility in all sustainability areas for each company size

it seems that employee satisfaction is the main result of the right use of employee skills and knowledge.

However, other factors could influence employee satisfaction, such as the amount or extent to which employees enjoy their work. Enjoyment of work mostly depends on the work environment and how the employee feels comfortable and integrated into it. In addition, the level of responsibility that an employee has in environmental, social and economic area could impact on his/her satisfaction. In this case, responsibility of employee indicates the economic, social and environmental issues that the manager gives to the employee as their responsibility.

Overall, the amount of responsibilities an employee has does not always have a positive influence on his/her satisfaction. The graph below (see Fig. 7) shows that economic responsibility is the one that has the least impact on employee’ satisfaction. In contrast, environmental responsibility has a quite strong impact on satisfaction. Therefore, the responsibilities that can positively influence employee’ satisfaction are those which can increase employee involvement and are voluntarily desired and not imposed.

Overall, employee satisfaction is a key factor in achieving sustainability. To achieve high level of sustainability the manager must be able to properly involve his employees, for example, allocating the correct responsibilities for each employee and not underestimating their potential. Once again, managers have a crucial role. In this analysis, managers could be defined as inexperienced because they do not know how to lead good sustainability leadership. Gaining trust and the attention of an employee is a complicated process, which leads to more satisfying and productive work. Employee satisfaction has a positive impact on whole enterprise. Furthermore, employee satisfaction helps to lead to an evident change in sustainability and competitive advantage for the future of the company.

4 Discussion

The analysis in this paper highlights the low attention to the creation of future value, especially concerning economic and environmental areas. Usually, the future economic value generally is fundamental for companies. However, the result highlights the low attention to economic sustainability. This result could derive from the managerialism approach and low involvement of employee within the economic area and the pursuit of short-term incomes. Managers do not appear to include sociotechnical perspectives therefore following an unsustainable approach and do not pursue systemic sustainability and long-term benefits.

Environment is commonly perceived as the first area associated with sustainability. In recent years, legislation and then the customer' perspectives pushed enterprises to have a green vision and having more respect for the environment. However, our analysis shows that enterprises still give poor attention to environmental sustainability. Managers do not transfer environmental knowledge to their employees, and they do not involve them as the sociotechnical approach suggest. Employees are the ones that interface with the environment in their work practices. Therefore, employees should have proper training on best environmental practices to pursue sustainability as integrated part of their work. Overall, due to the lack of attention to future value as well as the maximum sustainable levels, there seems to be no presence of systemic sustainability.

The analysis identifies a correlation between the current problem with systemic sustainability and future value. The present problem of corporate sustainability could be addressed paying attention to the creation of value for future generations. Only through the contextualization and systemic understanding of the problem, could managers support employees to find the best solutions that lead to sustainability in work practices. However, the most critical issue that was noticed is the poor support and guidance that employees have from managers. In general, due to a lack of knowledge of sustainability practices in context, there is a low correlation of actual work practices and the ideal. The analysis of employees' sustainable work practices shows that the current approach of managers is incorrect. The Chartered Institute of Personnel and Development confirmed that the quality and approach of managers has not improved in the past decade [22]. Therefore, innovation is needed to develop sustainable enterprises [8]. Managers, as the cultivators of the enterprise' context, have a crucial role in sustainable work practices [8]. From sociotechnical perspective, developing both technology and human system is a way to bring innovation through an enterprise.

If managers follow the sociotechnical approach, focusing on employee' work practices, they can identify the main sustainability problems in the economic, social and environmental areas. Most of all, managers could detect and co-construct solutions with the employee to improve the implementation of sustainability with the triple bottom line approach [23]. In line with the Mumford perspective, and focusing

on human sustainability the collaboration between manager and employee is essential. However, communication can be difficult in an enterprise context. Communication difficulties can hinder collaboration. To mediate and facilitate the communication the introduction of a facilitator could help the interactions and collaboration between managers and employees [11]. The implementation of collaboration and communication could be a benefit for better implementation of sustainability in work practices.

The analysis also highlights that it is important give attention to the experience of employees in order to improve employee satisfaction. Engaged employees are more likely to perceive that their knowledge is used in the right way. Therefore, if managers implement a systemic sociotechnical approach, this would be an overall improvement which could help the enterprise to move towards business excellence. From this perspective, managers should approach and understand employees and their work practices that are important for sustainability in practice. Furthermore, employees that feel valued for their efforts may voluntarily improve their relations with sustainable work practices. The desire of each employee to contribute to a change in the achievement of business excellence should be the bases of the companies work system [8]. Therefore, to remain competitive, managers should adopt a participative approach [22]. Instead of imposing directives, managers should combine individual and organizational needs, understanding their employees and learning about how to impact positively on them [22]. Overall, according to the industry 5.0 agenda, enterprises can be competitive by supporting employees work practices [8]. As a consequence, this could lead to a competitive advantage and sustainability, as a business is not sustainable if it cannot be competitive.

Triple bottom line together systemic sociotechnical approach seems to be a logical way to pursue sustainability in enterprises. TBL emphasizes the essential aspects of every business. The single areas included in the TBL approach are not relevant enough in isolation. The different sustainability' areas are systemically interconnected. The systemic perception of sustainability highlights that a change in a part of the system could affect the whole [16]. Sociotechnical system theory underlines the importance to focus on both technological and human systems to bring innovation and improve the performances of the whole system [16]. Even if it is not entirely developed in sustainability' practices, human sustainability is integrated into the TBL approach. Therefore, from a sociotechnical perspective, the authors argue the need to pursue a fourth bottom line creating the systemic sustainability model.

The model aims to achieve systemic sustainability with a sociotechnical perspective. Therefore, the model focuses on economic, environmental, social and technological aspects and their relationships (see Fig. 8). Previously, technology was not explicitly included in the TBL approach; however, it appears to have been assumed as part of each sustainability area. The technological area presents interconnections with other sustainability' areas and has the potential to afford systemic changes. Furthermore, technology is a part of the problem and part of the solution to achieve sustainability bringing innovation and competitive advantage in an enterprise. Therefore, there is a need to include technology and relationships with other areas as one integrated whole to achieve systemic sustainability.

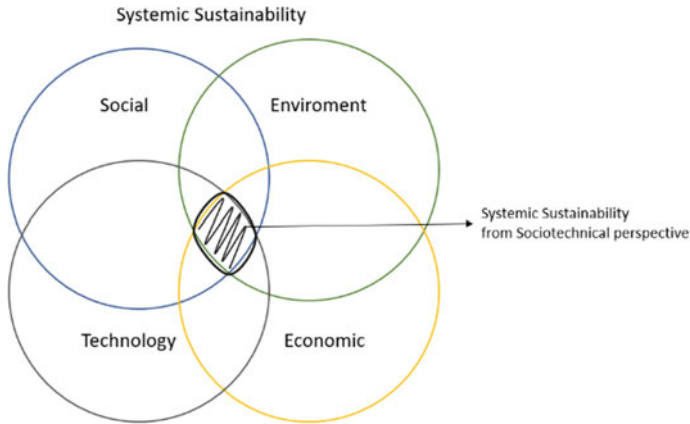


Fig. 8 Systemic sustainability

5 Conclusions

The sociotechnical approach helps to achieve business excellence and sustainable systems by focusing on human and technological capital. As Bednar and Sadok argue, “*Social and Human Sustainability are necessary to support loyalty and the development of quality work results and excellence in work practices*” [13: 24]. Sociotechnical system approach “*could provide support for companies to explore potential to incorporate future sustainability practices, involving changes in work systems design*” [24: 11]. Systemic sustainability model merge sociotechnical perspective focusing on economic, environmental, social and technological aspects. Therefore, sociotechnical and systemic sustainability could lay the foundations for the improvement of business activities and long-term systemic sustainability in business excellence. In addition, these approaches help enterprises to improve and verify corporate sustainability and also, they will be complying with the European directive [14].

In future analysis, in addition to these findings, it could be interesting to take further on investigation the involvement of individual employees in economic, environmental and social sustainability. Employee quality of involvement could be useful to understand the potential and future sustainable growth. The development of new categories could, for example, be intended to specify the level of employee involvement. This categorisation could support a complete overview of sustainability from the employee perspective. Furthermore, it could be interesting also to identify the systemic interconnection between different sustainability areas. The understanding and the hidden meaning of employees’ perspectives that underpin the systemic perspective should be explored further to support a better-informed analysis. In addition, data related to cyber-security’ aspects could be added to the raw dataset in order to explore and integrate IS security technology into the analysis. Overall, to analyse the level of systemic sustainability, there is the need to analyse the whole

context deeper, starting with everyday employee work practices which are intended to implement sustainability practices, and expanding from there.

In conclusion, employees are the mirror which reflects enterprise. Only from the context of employees can we understand if sustainability is implemented in real work practices. Sustainability is not a concept that should remain abstract. Instead, systemic sustainability should be implemented day by day in real-world work practices under economic, environmental, technological and social aspects with the collaboration of both employees and managers. For this reason, when sustainability is integrated within the behavior and thinking of employees, the company can be considered sustainable.

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