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CIRCULAR ECONOMY'S STANDARDIZED MANAGEMENT SYSTEMS. CHOOSING THE BEST PRACTICE. EVIDENCE FROM POLAND

Abstract*: The aim of this paper is to investigate the scope of undertaken and planned actions related to circular economy's standardized management systems according to first Europe's published standards (BS 8001: 2017, XPX 30-901: 2018) in the leading polish food sector organization for better understanding the relations between circular economy, quality management and food safety management systems. The authors try to estimate which requirements of both standards suite best for the food sector companies as well as which of them will fulfil the companies' expectations and requirements in the area of circular economics. This study also enriches the current knowledge about ways of using and integrating circular economy with the existing management systems within the food sector companies. The main limitation of the analysis is that it covers only one international organization with its specific strategy and management culture. It is recommended for the future research to in-vestigate the topic in other organizations.*

Keywords: *Circular economy; Standardized management systems; Sustainability; BS 8001: 2017; XPX 30-901: 2018*

1. Introduction

The concept of a circular economy is the opposite of the prevailing linear model of the economy. This model was based on the assumption that the abundance and availability of resources allowed for their free use, production of goods from them, and after their use - disposal. This concept, functioning for many years, contributed to a significant waste of materials and irrational exploitation of natural resources (Zarębska, 2016). The transition to a circular economy, where the value of products, materials and resources in the economy is maintained for as long as possible and waste generation is kept to a minimum, makes an important contribution to EU efforts to create a sustainable, low-carbon, resource-efficient and competitive economy. Such a transition gives the opportunity to transform our economy and provide Europe with a new and lasting competitive advantage. The concept of a circular economy is a holistic approach to product management, aimed at creating a waste-free product system, in line with the cradle to cradle idea (Zarębska, 2016). The main assumption here is the creation of industrial systems that will not only be efficient, but essentially waste-free. The basis of this concept is the fact that today's linear mode of operation of the world economy drives a culture of excessive consumption and generates much larger amounts of waste than can be controlled in the long term. As a contrast, an approach of the circular economy has been proposed (Wijkman & Skanberg, 2016). The basis of this

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assumption lies, among others as follows (Towards economy..., 2011):

- limiting the amount of materials required to provide a specific service (limiting weight);
- reducing energy and material consumption at the stages of production and use (efficiency);
- reducing the use of hazardous or difficult to recycle materials in products and production processes (substitution);
- designing products that are easier to maintain, repair, upgrade, rework or recycle (ecodesign).

There are different interpretations of this idea in different organizations, along with lots of terminology, often misused or interchangeably used. This increases the complexity of the concept, which in turn can discourage organizations seeking to improve resource management. To facilitate the implementation of circular economy principles, existing standardized management systems that can facilitate business operations can be used. The most popular management systems are systems that are built based on the ISO 9001 standard, especially in its latest edition. Its construction was created based on the so-called High Level Structure (HLS), which allows the system to be adapted to many industries. In addition the following, standards have been created specifically for use in the circular economy:

- British BS 8001: 2017 Framework for implementing the principles of the circular economy in organizations - Guide, and
- French X PX 30-901: 2018 Circular economy - Circular economy project management system - Requirements and guidelines.

The goal of this article is to characterize: at first the approach to the circular economy and new management standards dedicated to use in enterprises operating in accordance with this approach, second, it tries to estimate which requirements of both standards suite best for the food sector companies as well as which of them will fulfil the companies' expectations and requirements in the area of circular economics. The circular economy, food safety and quality management systems perspectives are investigated as a framework for the study.

2. Circular economy in general

The concept of a circular economy developed in the 21st century, but the genesis of this approach dates back to the 1970s of the last century, where some attempts were made to close material cycles to generate economic savings (Tundys, 2015) thus replacing the linear economy.

Several authors, like Andersen (Andersen, 2007), Ghisellini (Ghisellini et al., 2016), and Su (Su et al., 2013) attribute the introduction of the concept of circular economy to Pearce and Turner (Pearce & Turner, 2006) by describing how natural resources influence the economy by providing inputs for production and consumption as well as serving as a sink for outputs in the form of waste, they investigate the linear and open-ended characteristics of contemporary economic systems (Geissdoerfer et al., 2017).

Walter Stahel, in his book *The Performance Economy*, presents convincing arguments for increasing wealth by replacing linear material processing with activities such as reuse, recycling and recycling. Today's economic models are based on maximizing the sales volume of various products. As an alternative, Stahel suggests switching to providing services. The sale of many products can be replaced by leasing or renting combined with high-quality services (Stahel, 2010).

Since the responsibility for the materials used in a given product remains with the producing enterprise, strong incentives arise to derive income from something already manufactured as long as possible. The contrast compared to today's system is significant. Stahel also claims that the effects of increasing employment when moving towards a circular economy based on functional performance are obvious, as service sectors are more labour-intensive than the

mining sector or increasingly mechanized production lines in factories. The main principles behind the cradle-to-cradle concept and the functional performance economy are gradually spreading. The flagship program of the European Commission 'Europe using resources efficiently' presented in September 2011 emphasized that (A resource-efficient Europe.., 2011):

- Better product design can both reduce demand for energy and raw materials, as well as make them more durable and more easily recyclable.
- Increased recycling rates will reduce the pressure on primary raw materials, while helping to re-use valuable materials that would otherwise be wasted and reducing energy consumption and greenhouse gas emissions associated with their extraction and processing.

In 2015, the European Commission adopted an ambitious package on the circular economy, which aims to stimulate competitiveness, create jobs and support sustainable economic growth (Nowicki & Kafel, 2019). The circular economy is a business system and it replaces the concept of "end-of-life". In essence, it aims to maximize the use of renewable energy sources, eliminate the use of toxic chemicals that prevent reuse as secondary raw materials. Such an economy is based on several simple principles (Adamczyk, 2016):

- designing products in non-waste technology;
- strict distinction of components of consumable products as well as durable;
- energy.

In a communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, a detailed scheme of actions aimed at closing cycles was determined, developed, among others by the Ellen MacArthur Foundation (EMF). According to the document, the circular economy consists primarily of (Towards the economy ..., 2014):

- limiting the amount of materials required to provide a specific service (weight reduction);
- extending the useful life of products (durability);
- reducing the consumption of energy and materials at the stages of production and use (efficiency);
- reducing the use of hazardous or difficult to recycle materials in products and production processes (substitution);
- creating markets for secondary raw materials (based on standards, public procurement, etc.);
- designing products that are easier to maintain, repair, upgrade, rework or recycle (eco-design);
- the development of necessary services for consumers in the area (maintenance / repair, etc.);
- encouraging and supporting consumers to reduce waste and high quality segregation;
- encouraging segregation and using collection systems to minimize recycling and reuse;
- facilitating the grouping of actions to prevent the by-products being used for waste (industrial symbiosis); and
- stimulating conditions conducive to wider and better consumer choice through lease, rental or sharing services as an alternative to owning products, while safeguarding consumers' interests (in terms of costs, protection, information, contractual conditions, insurance aspects, etc.).

Developing the above principles, the communication made a clear statement in favor of implementing the circular economy and defined the following objectives (Wijkman & Skanberg, 2016), (Towards a circular economy… 2015):

- The circular economy is an industrial system that is intended and regenerative. In a circular economy, products are designed for ease of reuse, dismantling and reassembly - or recycling - assuming that the foundation of economic growth is the re-use of large amounts of materials recovered at the end of their life instead of extracting new raw materials.
- The circular economy is shifting towards the use of renewable energy, it excludes the use of poisonous chemicals hindering the re-use of materials, and aims to avoid waste through better and innovative design of materials, products, systems and, as part of this, economic models.

The literature of the subject includes many attempts to define a circular economy. However, according to the authors, one of the most comprehensive definitions of the circular economy is the definition developed by Geissdoerfer, Savaget and others (Geissdoerfer et al., 2017), which describes the circular economy as a regenerative system in which the input of resources and waste, emissions and losses energy are minimized by slowing, closing and narrowing material and energy loops. This can be achieved through long-term design, maintenance, repair, reuse, regeneration and recycling.

Currently, the issue of the circular economy is gaining more and more attention. This model is characterized by designed renewability and reproducibility, and its goal is to constantly maintain the highest value and usability of products, components and materials in separate biological and technical cycles. At the heart of the circular economy is the assumption that it is a continuous cycle of development that preserves and enriches natural capital, optimizes raw material gains, and minimizes systemic risk by managing non-renewable and renewable material streams. This system works on every scale. Its essence is the final decoupling of economic development from the consumption of limited resources (Towards a circular economy.., 2015). The circular economy is based on three principles, which are shown in Figure 1.

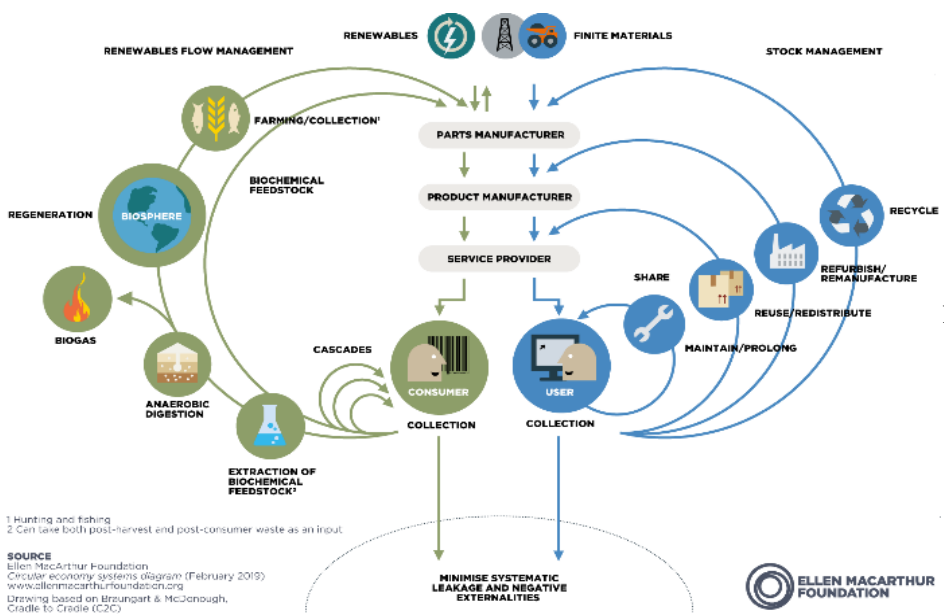

Fig. 1. Circular economy diagram. Source: (Towards a circular economy..., 2015)

To sum up the above, there is a need to standardize the CE approach as well as the organization's activities in this area. This will contribute to obtain uniform CE standards and allow to conduct a comparative analysis of the results for individual organizations (Muradin, Foltynowicz 2019).

There are also other aspects related to CE implementation, such as drivers, supporting elements and inhibitors of CE implementation, as well as the configuration of the circular economy supply chain (Masi, Kumar and Garza-Reyes 2018).

3. Bs 8001: 2017 framework for implementing the principles of the circular economy in organizations – guide

In 2017, BSI – British Standard Institute, published the world's first standard for the circular economy. The standard is designed to help organizations and individuals consider and implement more circular and sustainable practices in their companies, whether through improved working practices, providing more products and services produced in accordance with the principles of the circular economy, or by redesigning the entire model business and value offerings. The standard also aims to provide frameworks and guidelines for a wide range of organizations of various sizes and levels of knowledge, as well as understanding the circular economy. The standard is divided into two areas: the first describes what the circular economy is and why it is worth switching to a sustainable mode of operation, while the second describes how the requirements of this standard should be implemented.

This British Standard focuses on a circular economy that promotes optimal use of resources, reuse, repair, renewal, regeneration and recycling of materials and products, as well as the preservation and regeneration of natural capital by returning biological nutrients to the biosphere. Design and innovation in processes and products or services (e.g. for repair, reuse, recycling) can be supplemented with business model projects and innovations, using approaches such as performance-based models to manage the circulation of products and materials in the system (BS 8001: 2017).

The purpose of this British standard is to provide guidance to organizations of all types and sizes, regardless of where they are in the world, about the steps they can take to move to a more circular and sustainable mode of operation. Implementing the principles of a circular economy gives organizations the opportunity to rethink how they conduct business, potentially enabling them to remain in a circular environment, sustainability and competitiveness. The standard consists of three main elements: principles, structure and guidelines, which were discussed in turn (BS 8001: 2017).

3.1 Principles

The standard identifies six principles of the circular economy:

- Principle 1. System thinking: organizations take a holistic approach to understand how individual decisions and actions interact within the wider systems of which they are part.
- Principle 2. Innovation: organizations constantly innovate to create value, enabling sustainable resource management by designing processes, products / services and business models.
- Principle 3. Governance: Organizations manage the direct and indirect effects of their decisions and activities within the wider systems of which they are part.
- Principle 4. Cooperation: organizations collaborate internally and externally through formal and / or informal arrangements to create mutual value.
- Principle 5. Value optimization: organizations keep all products, components and materials in the

highest value and usability at all times.
- Principle 6. Transparency: organizations are open to decisions and actions that affect their ability to switch to a more circular and balanced mode of action and are ready to convey them in a clear, accurate, timely, fair and complete manner.

3.2 Flexible framework

The standard identifies eight stages of implementing the circular economy**:**

- Stage 1. Framing. Organizations should identify the importance of a circular economy for their business and determine where to start.
- Stage 2. Scoping. When considering the vision, strategic plan and direction of the circular economy, organizations should carefully look at what is possible and / or required in the context of the circular economy. To do this, follow these steps.
- Stage 3. Idea Generation. Organizations should develop a list of ideas / options to address the problems and / or opportunities identified in stage 2 and prioritize them accordingly in the context of the circular economy vision, strategic plan and goals.
- Stage 4. Feasibility. Organizations should assess the practicality of implementing priority ideas / options identified in stage 3.
- Stage 5. Business case. Organizations should develop a business case to secure the necessary resources to pilot new ideas / options and then implement, scale and develop them.
- Stage 6. Piloting and prototyping. Organizations should experiment with ideas / options on a small scale to determine practical feasibility.
- Stage 7. Delivery and implementation. Organizations should scale / implement adoption and integration of proven approaches to transition to a more circular and sustainable mode of operation.
- Stage 8. Monitor, review and reporting. Organizations should track performance to ensure continued success as well as continuous and transformational improvement.

3.3 Supporting guidance

Supporting guidelines proposed in this standard refer to mechanisms and business models. To comply with the standard, the selected business model and its value proposition must be based on the principles of a circular economy and flexible structure (Pomponi & Moncaster, 2019). The business model includes a system of interrelated and interdependent decisions and actions selected by the organization that determine how it creates, delivers and records value in the short, medium and long term. However, innovation in the business model for the circular economy goes beyond progress in processes and / or products or services. Some existing business models provide clear environmental and social benefits, although they may be secondary to the organization's main value offer. The implementation of any business model does not necessarily mean a transition to a more circular and balanced mode of operation. From the perspective of this British standard, this is best achieved through a systemic approach in which the chosen business model and its value proposition are based on the principles of a circular economy.

The companies can apply the standard for life cycle assessment to quantify the environmental and life cycle impacts of the products and services they deliver to their customers. It can be applied already during design to evaluate different possible product designs and circular economy business models as listed in the BSI circular economy standard (Pauliuk, 2018).

4. XPX 30-901: 2018 Circular economy - Circular economy project management system - Requirements and guidelines

Another standardized system on circular economy is the French standard published by ANFOR in 2018. This standard sets out the requirements for an organization's project management system to improve environmental, economic and social performance, and to contribute to the development of a circular economy. Similarly to the British standard described above, it applies to organizations of all sizes, functioning in all branches of business. In this document, the term project refers to any change goal that is supported by the organization to transform its activities, in whole or in part, towards a more resource-efficient model, thus limiting the environmental impact of the business. A project may relate to activities, products or services that the organization identifies. This project management standard can apply to any type of project, such as strategy development, delivery of new services, modification of the purchase process, design or distribution of a service or product. It has been developed and is intended for organizations wanting to manage their projects in a systemic way. It provides requirements and practical recommendations for initiating, planning, implementing, measuring and managing projects by adopting an open and holistic approach. In particular, it sets out the various stages organizations need to take for their project to contribute to the transition to a circular economy (Muradin & Foltynowicz, 2019).

The French standard was built on the basis of a new approach to standardized management systems, named the HLS model (high level structure), which is so popular among current editions of ISO standards (ISO 9001, ISO 14001, ISO 45001). It also covers the universal management requirements (Nowicki et al., 2019b).

One of the main assumptions of the organization functioning in accordance with the requirements of this standard is to define external and internal assumptions that are relevant to the defined final goal and which affect its ability to achieve the intended results in the project management system in the scope of the circular economy. In addition to system issues arising from the HLS structure, the most important element of the standard are the requirements for a project management system in a circular economy. The standard includes requirements to simultaneously take into account the contribution of projects to the three dimensions of sustainable development, taking into account direct and indirect effects. If the project embodies the drive for change in products and services, impacts should be analyzed throughout the life cycle. In addition to the requirements and recommendations for applying the approach to the management system, this standard also provides organizations with a broader methodological framework based on cross-analysis taking into account the 7 areas of project management activities proposed in the standard for CE (X PX 30-901: 2018):

- Sustainable procurement of supplies. Sustainable procurement involves taking into account the environmental and societal impacts of the production cycle of the resources, whether renewable or not, necessary for a goods or service production process. This area of action can concern the natural resource extraction and utilization processes, the acquisition of the components necessary for a goods or service production process or the replacement of non-renewable raw materials by renewable materials, or secondary raw materials (SRM) or recycled raw materials (RRM).
- Eco-design. Eco-design is implemented through by the systematic integration of environmental aspects from the design stage and development of

products (goods and services, systems), with the aim of reducing adverse environmental impacts throughout their cycle while achieving equivalent or higher performance. (Adapted from ISO 14006:2011161). Eco-design can concern the "design of a product or a service, taking into account its negative effects on the environment during its life cycle in order to reduce them, while trying to preserve its qualities or performance". This area also concerns aspects relating to eco-efficiency, products and processes.

- Industrial symbiosis. Industrial symbiosis is materialized by the pooling and/or the interrelation of different production phases, of several processes for the manufacture of specific goods or services, aiming at the shared management of certain functions, goods, stocks, flows of materials and energy in order to optimize them. This area can encompass substitution synergies set up between several economic players to optimize the use of resources, where, for example, the waste from one sector can become the raw material for another. It can also include synergies pooling flows of materials, energy, water, infrastructures, goods or services in order to optimize the use of resources. Geographical proximity can be a determining factor in interrelations or pooling for the implementation of regional industrial symbiosis or industrial and regional ecology. Industrial and regional ecology approaches are voluntary, collective actions that bring together a diversity of public or private players aiming to optimise resources while fostering the anchoring of activities and employment in the regions.
- Functional service economy. The functional or service economy is materialized by fostering usage rather than ownership. This area tends to sell services rather than the products themselves, with the aim to ensure usage performance, useful effects or results to be achieved.
- Responsible consumption. Responsible consumption is materialized by taking into account the economic, social and environmental impacts of purchasing and using a product or a service. This applies to the changing of consumption practices by, for example, examining the possibility of reuse in a different purpose, repair, reuse for the same purpose, management of production discards, etc. It is based on the efficiency of informing the buyers, prescribers and users, which in turn is based on the environmental and social aspects of the product life cycle in the same way as the economic information (price, place of production, quality, etc.). This also encompasses the development of buying methods (buying second-hand or reconditioned products, for example) and consumption models (collaborative consumption, joint purchasing, sharing economy).
- Product lifetime extension. Product lifetime extension results in the provision of a product or service under conditions that enable its duration of use to be extended compared with an equivalent product or service while guaranteeing that the initial performance or clearly specified performance characteristics shall be maintained. This covers the measures taken to guarantee the availability of spare parts, product modularity to facilitate performance, updates, maintenance, reuse,

repairability and conformity. This domain also touches on the organizational measures allowing their implementation.

- Efficient management of end-of-life products and materials. Efficient management of end-of-life products and materials is materialized by the transformation, including recycling, of the post-consumption residues into substances, materials or products to fulfil their initial function or for other purposes. This domain touches on all the techniques for transforming waste - including organic waste - after collection, with the aim of reintroducing all or part of it into a production cycle. This theme also concerns the products associated with the services.

The above-mentioned areas of activities related to project management in the circular economy proposed in the described standard should be analyzed in three dimensions: **environmental, economic and social**, which results from the assumption of the standard and the proposed cross-analysis.

In terms of system, taking into account the functioning of the project management system in the circular economy, the organization should establish, implement, update and constantly improve the management system of circular economy projects, including the necessary processes and their interactions, as required by the standard. To enrich its management system and related processes, the organization should also take into account the analysis of problems, risks and opportunities, and the mutual expectations of stakeholders.

5. Methodology

The study was carried out in March 2020. The study was meant to be as a pilot study. There was chosen food sector manufacturing organization. The main reason for the selection of this company, lies on being the one of the biggest polish organization producing food products. It was assumed that examined organization had implemented and had certified at least one standardized management system based on ISO 9001 as well as activities related to environmental management. The types of studies were case studies. In the organization, the person responsible for the operation of management systems (representative of the leadership of the organization in this area) was interviewed. The study was conducted in the form of in-depth interview on the basis of pre-prepared script. The interview was audio recorded. The developed case scenario based on new standardized management systems (BS 8001:2017, XPX 30-901:2018) common requirements as well as its influence on circular economy. Characteristics of studied organization:

- One of the biggest companies in the segment of food products in Central and Eastern Europe.
- The leader on the market of juices, nectars and drinks, a leading producer of instant products.
- Their products are made in 15 modern plants in Central and Eastern Europe.
- In 2019, theirs consolidated sales revenues reached PLN 5 billion.

As a market leader, the selected organization has the ability to create new trends, including those related to circular economy activities in production or communication in this regard with the consumers.

On the other hand this is the first approach to estimate which requirements of both new standards suite best for the food sector companies as well as which of them will fulfil the companies' expectations and requirements in the area of circular economics.

6. Case's analysis

The interview for the research was divided into two parts. Firstly, there were questions to get information about companies' profile, second part was concerned on the general opinion about

the circular economy standards and on comparison of CE management standards.

The analyzed company is one of the biggest manufacturer, producing wide variety of food products. This company originating from Poland, however they are having plants all across Central and Eastern Europe. They operate on international markets, on very big scale.

Considering questions on general opinion on circular economy issues including those two new standards the company is well prepared and very interested in standardizing their processes in that area. The company's representative said that those standards are compatible with each other, they are not so difficult to implement, however the implementation process may last a lot longer than their previous standards (ISO 9001, HACCP) due to its complexity and extensiveness.

The next part of the interview considered particular structure of standards and it practical usage. First question in that area was which stages of the standards are the easy ones in implementation process in food company and which are the ones that are difficult. The interviewed person answered, that for their company, which is a big corporation, the easiest parts during the implementation process would be the fulfilment of requirements regarding the general framing, scoping as well as idea generation within the BS 8001 standard, and the most difficult would be the 4th stage - feasibility. According to the first two stages of BS standard the company's strategy is focused on organic growth and acquisitions in the food and drink industry while maintaining the principles of a circular economy and it should stay at it is, but business model should be adjusted to the circular economy principles and requirements. They are not going to implement a particular business model in the company, but they are trying to use different solutions from different models that are suitable for this company. As far as the representative said that for now they are preparing to reorganize, map and arrange all the processes within the company and it will enable to maintain the running the business smoothly. These activities are implemented taking into account the requirements of the circular economy as well as costs effectiveness. The next question was on which requirements or principles the company is already fulfilling. The representative answered that stage that they are realizing already is idea generation, where there are a lot of projects going on especially on creating new ways of production, process management, they run innovation workshops for employees as well as the employees may participate in the project called "idea-mania" where they can develop a new solutions for the company and if the solution is implemented, the employee is getting an extra financial bonus. A lot of those new solutions and ideas had related to environmental management and to reduction of company's impact on environment. On the other hand the difficulty within this area is the feasibility, where the possibility to implement some of the new solutions (created by R&D department as well as by employees) or requirements that are coming from this ideas become difficult and time consuming to be realized.

Considering the French standard, the company representative said that the easiest areas to fulfill requirements while implementing it, are sustainable procurement of supplies (they are trying to get most of the supplies from the local producers and suppliers), and industrial symbiosis (where their waste from fruit and vegetable processing goes to local farmers as animal feed). Beside those two areas, almost all of the projects that has been realized within the company, comply with environmental requirements that is a part of idea of eco-design. The biggest difficulty for food industry within XPX standard that needed to be fulfilled would be the product life extension understood in terms of shelf-life of the food itself as well as extending the life of the packaging.

Next question concerned the necessity to design and create new standards for the circular economy, or would it only be enough to expand the standards that the company has already implemented, e.g. ISO 9001 or ISO 14001 and expand them with requirements related to the circular economy. Company representative clearly stated that it is not necessary to

implement further standardized systems, it would be enough to extend existing ones with new rules, areas and requirements, that would be much cheaper, faster and more efficient in the functioning of the company. It was also stated that as for food industry, and for the company who has implemented at least one of the standardized management systems such as ISO 9001, ISO 14001 or ISO 22000 the best solution for standardized circular economy management system would be the French approach, because it is built based on HLS and may be easily integrated with existing systems in the enterprise.

Another question asked, concerned the need to hire an external / consulting company that would help implement CE in the enterprise. The answer was surprising, because the representative stated that they have resources in the company through which they would be able to implement both standards themselves, but it could take more time and could be less effective. Therefore, if they were to implement them, they would hire a consulting company that has experience in this field, which in consequence would be faster, cheaper and more effective. Unfortunately, this situation might not be the case in smaller enterprises and they would have to implement the system themselves.

Next question was about whether implementation of circular economy system in food company is profitable. The representative said that there are some of the activities within circular economy that are more or less profitable. As an example cogeneration was given, where they produce energy form biogas which is generated from food production waste, and as far for now it is only profitable if government founding exist. Another examples of implementation of environmental requirements that are also one of good practices of circular economy were water consumption reduction due to technological changes of production line, as well as packaging mass reduction.

Another question concerned the necessity of designing new standards and which standard of those two is better in general. The representative stated that there should be one common standard for circular economy management, built on the basis of HLS that will help to integrate it, but there is no need to design particular standards for each branch on the market. According to representative the best way is to create guidelines dedicated for each branch of industry based on the circular economy management system. Among those two standard the XPX is better for food industry according to the representative of researched company.

The last part of the study concerned on advantages and disadvantages of those two standards. The representative answered that implementation of new requirements in the circular economy area will force on employees to conduct in-depth processes analysis that may lead to improve the effectiveness of them. And at the beginning of the process it will be the biggest advantage, because it may show to the management what they can do better or in which processes they are not effective enough. On the other hand the disadvantage are costs and time of implementation that is difficult to estimate as well as lack of resources especially among people.

7. Conclusions

The goals of the circular economy can relate to perspectives such as environmental quality, economic well-being, social equality or impact on future generations (Kirchherr et al. 2017). The conducted researches and obtained results show that theory of Circular Economy is still a new concept towards which companies would be increasingly addressing their attention in the future. The case study results showed that companies will be very interested in Circular Economy, even if they would need to develop further knowledge about it. Representative of researched company declared to be well enough aware of the concept of Circular Economy and would like to deepen its principles and practices. Notwithstanding their interest, a potential gap seems to emerge between the positive attitude towards Circular Economy and their practical implementation since Circular Economy

practices adoption still seems limited and mainly related only to reducing actions. Due the fact that managers tend to be focused on perceived economic advantages, such as process efficiency as well as costs reduction, and environmental advantages linked to such practices, they still underestimate the potential social impact, which can derive from CE adoption in terms of general improvement of social well-being and a quality of life (Nowicki et al. 2019a).

The main outcomes of the conducted researches are:

- the implementation process of CE system may last a lot longer than their previous standards (ISO 9001, HACCP) due to its complexity and extensiveness,
- the easiest parts of BS standard during the implementation process would be the fulfilment of requirements regarding the general framing, scoping as well as idea generation, the most difficult - feasibility,
- the easiest areas of XPX standard to fulfill requirements while implementing it, are sustainable procurement of supplies and industrial symbiosis,
- the biggest difficulty for food industry within XPX standard would be the product life extension understood in terms of shelf-life of the food itself as well as extending the life of the packaging,
- there is no need implement another standardized systems, it would be enough to extend existing ones with new rules, areas and requirements, that would be much cheaper, faster and more efficient,
- the best solution for standardized circular economy management system would be the French approach, because it is built based on HLS and may be easily integrated with existing systems in the enterprise.

The main limitation of the analysis is that it covers only one international organization with its specific strategy and management culture and only the top management point of view was considered in the study. It is recommended for the future re-search to investigate the topic in other international organizations. The relations between companies in supply chain and the benefits of leading the sustainable activities that are common with the goals of: circular economy, quality and food safety management systems. The other line of future research can be focused on the other solutions related to implementation of circular economics approach among food manufacturers. Even if there are no reasons to change the factory operations activities according to the circular economics goals, there are still the management systems goals (e.g. quality, environmental as well as food safety), where some specific actions should be undertaken.

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