

 **IMPLICATIONS OF VALUE CO-CREATION IN AGRO-INDUSTRIAL SERVICES** **Fabio Rafael Domiciano Borota¹** **Andrei Bonamigo²** **Herlandí de Souza Andrade³**

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ABSTRACT

Purpose: This study aims to list the managerial implications arisen from an interaction between a brewery and a Brazilian government agency grounded in the Lean principles of value co-creation through a case study.

Design/Methodology/Approach: Empirical data on the actors were collected through questionnaires with managers and documents shared as they were being filled out. Their content analysis was carried out according to Bardin (2011).

Originality: This is the very first study carried out to evaluate the benefits reaped from an interaction between a brewery and a Brazilian government agency grounded in the Lean principles of value co-creation.

Results: Managerial implications involved in value co-creation are elucidated in respect of agro-industrial services provided by the brewery and a Brazilian government agency. Thus, Integration Strategy, Protection mechanisms and Growth opportunity constitute key elements in networking orchestration while providing agro-industrial services.

Theoretical and methodological contributions: The factors affecting information and knowledge were shared between partners for improving the brewery production chain. The concept of value co-creation allowed overcoming issues of innovation and providing the actors with better services.

Management contributions: Once having identified the three basic elements of a successful cooperation, as well as managerial implications concerning the actors involved, this study assists managers and researchers in developing strategies to overcome the obstacles faced in the provision of agro-industrial services based on the Lean principles of value co-creation. Furthermore, supporting factors in making decisions towards value co-creation are exposed so as to stimulate innovation via value co-creation and network orchestration.

Keywords: value co-creation, value co-destruction, agro-industrial services, network orchestration.

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IMPLICAÇÕES DA COCRIAÇÃO DE VALOR EM SERVIÇOS AGROINDUSTRIAIS

RESUMO

Objetivo: Este estudo objetiva listar as implicações gerenciais da interação entre uma cervejaria e um órgão do governo brasileiro na perspectiva da cocriação de valor do Lean Thinking através de um estudo de caso.

Desenho/Metodologia/Abordagem: Os dados empíricos dos atores foram obtidos por meio de entrevistas com os gestores das empresas e documentos compartilhados nas entrevistas. A análise de conteúdo das entrevistas e documentos compartilhados foi analisada segundo Bardin (2011).

Originalidade: Este é o primeiro estudo que avalia os benefícios da interação entre uma cervejaria e um órgão do governo brasileiro na perspectiva da cocriação de valor Lean.

Resultados: O estudo esclarece as implicações gerenciais envolvidas na cocriação de valor em serviços agroindustriais entre uma cervejaria e um órgão do governo brasileiro. Dessa forma, reconhecemos os elementos da Estratégia de Integração, Mecanismos de Proteção e Oportunidade de Crescimento como forma de orquestração do *networking* em serviços agroindustriais.

Contribuições teóricas e metodológicas: Os elementos vinculados às informações e conhecimentos foram compartilhados entre os parceiros para o aprimoramento da cadeia cervejeira. A cocriação de valor permitiu transpor problemas relacionados à inovação e proporcionar melhores serviços para os atores.

Contribuições gerenciais: Assim identificados os três elementos básicos para o sucesso da cooperação estudada, bem como as implicações gerenciais para os atores envolvidos, este estudo auxilia gestores e pesquisadores a desenvolver estratégias para lidar com os entraves nos serviços agroindustriais com base no Lean sob a perspectiva de cocriação de valor. Além disso, são expostos fatores de suporte para a tomada de decisões na cocriação de valor para estimular a inovação via cocriação de valor e orquestração da rede.

Keywords: cocriação de valor, co-destruição de valor, serviços agroindustriais, orquestração de redes.

IMPLICACIONES DE CO-CREACIÓN DE VALOR EN SERVICIOS AGROINDUSTRIALES

RESUMEN

Propósito: Este estudio tiene como objetivo listar las implicaciones gerenciales de la interacción entre una cervecería y una agencia del gobierno brasileño desde la perspectiva de co-creación de valor Lean através de un estudio de caso.

Diseño/Metodología/Enfoque: Los datos empíricos de los actores se obtuvieron a través de entrevistas con los gerentes y los documentos compartidos en las entrevistas. El análisis de contenido de las entrevistas y documentos compartidos fue analizado según Bardin, (2011).

Originalidad: Este es el primer estudio que evalúa los beneficios de la interacción entre una cervecería y una agencia del gobierno brasileño desde la perspectiva de co-creación de valor Lean.

Resultados: El estudio aclara las implicaciones gerenciales involucradas en la co-creación de valor en los servicios agroindustriales entre una cervecería y una agencia del gobierno brasileño. Reconocimos los elementos de Estrategia de Integración, Mecanismos de Protección y Oportunidad de Crecimiento como vía para la orquestación del actores.

Aportes teóricos y metodológicos: Los apoyos vinculados a la información y conocimiento fueron compartidos entre los socios para el mejoramiento de la cadena cervejera. La co-creación de valor permitió transponer problemas relacionados con la innovación y se brindaron mejores servicios para los actores.

Aportes de gestión: Este estudio ayuda a los gestores e investigadores a desarrollar estrategias para enfrentar los obstáculos en los servicios agroindustriales basados en en la perspectiva de co-creación de valor Lean. Adicionalmente, se exponen factores de apoyo a la toma de decisiones en co-creación de valor para estimular la innovación a través de la co-creación de valor y la orquestación de redes.

Palabras clave: co-creación de valor, co-destrucción de valor, servicios agroindustriales, orquestación de redes.

1 INTRODUCTION

An interaction between multiple organizations towards sharing information, technologies and knowledge allows gaining competitive advantages and stimulating innovation in organizations (Costa, Porto, & Plonski, 2010; Santos et al. 2018; Adikari et al. Alahakoon, 2021; Bonamigo et al. 2022).

An approach to encourage innovation through an interaction between actors is industrial services (Li et al. 2021; Bonamigo et al. 2021). Gitzel et al. (2016) defines an industrial service as a means to achieve growth and generate profit for companies, as there is greater importance when they struggle with price factors in their inserted context. Kohtämaki & Helo (2015) also state that there is decreased product advantage when the market becomes the most competitive.

The relevance of this work is demonstrated by the fact that the ever-increasing market demand compels companies to seek alternatives in order to remain competitive and find ways to encourage shared-value innovation, so that their products and services stand out in the market (Oliva & Kallenberg, 2003; da Costa et al. 2010; Frow et al. 2016).

Therefore, shared value creation for innovation must be avidly urged due to the fact that, as the market becomes increasingly competitive (Kohtämaki & Rajala, 2016), innovation processes for multiple actors are stimulated (Yordanova, 2018). According to Jouny-Rivier et al. (2017), multiple companies are reluctant to involve other actors in their development, since they believe that such a partnership might diminish their control over the production chain, once they are afraid of having their intellectual property stolen.

This is the main problem regarding value co-creation, given that it leads to an absence of integration and orchestration between agribusiness actors towards innovation (Bonamigo, Ferenhof, & Forcellini, 2017; Ferenhof et al. 2019), which can result in value co-destruction through the partnership, as a lack of integration between partners can lead to situations in which a particular decision creates value for some, but destroys value for others. Such destruction cannot be quickly perceived by partners, once they are not fully integrated (Plé, 2017; Plé & Cáceres, 2010).

Based on the aforementioned, this study aims to list the managerial implications arisen from an interaction between a brewery and a Brazilian government agency grounded in the Lean principles of value co-creation through a case study. It is expected to elucidate the managerial implications from a Lean thinking perspective upon value co-creation for

stimulating innovation between multiple actors in the agribusiness sector. This study allowed making contributions to guide agro-industrial companies so that they can find new ways to innovate, in addition to assisting them in comprehending that value co-creation is an effective strategy for collaborative development via complementary resources.

2 LITERATURE REVIEW

2.1 Value co-creation in agro-industrial services

Vargo & Lusch (2004) coined the term *Service-Dominant Logic* (SDL), where specific skills and knowledge are used as currency by different individuals so that companies can mutually take advantage of value co-creation. In the corporate world, value co-creation is widely used and consists in a direct interaction between companies and customers aimed to add value to their products and services (Troccoli, 2009).

While industrial services are defined as those offered to organizations aimed at industrial production, the existing bonds between companies are modified and improved through every new partnership established between them so as to achieve what is expected from value co-creation (Mudambi, Oliva, & Thomas, 2016). Literature on value co-creation suggests that customers are increasingly involved in assigning value to products and services offered by companies (da Costa et al. 2010).

This view is based on the premise that the value of a given product or service is set not only on the product sold, its material and its function, but also on all experiences customers have about the company, so that product value is generated as a result of multiple interactions between customers and companies in order to co-create a final product (Greer, Lusch, & Vargo 2016). Thus, interactions among consumers, investors and farmer occur as a result their interactions and experiences with respect to a given product or service (Greer et al. 2016; Liu et al. 2022).

As stated by Prahalad & Ramaswamy (2004), there is an interaction between actors involved in value co-creation once an it is established between farmers and consumers in such a way as to interconnect them aiming to fully exploit the potential of opportunities that both can offer towards reaping mutual benefits. Additionally, successful value co-creation occurs when companies are involved in all stages of a given project, i.e. from the moment resources are allocated in the production chain to the one in which companies make adaptations, in order to thoroughly understand how they affect their partner companies, their capabilities and areas of improvement (Guercini et al. 2014; Song et al. 2016).

According to Agarwal & Selen (2009) and Prahalad & Ramaswamy (2004), innovation in service firms transcends the boundaries of an enterprise, and the sector and is not limited to a single firm so that customers become factors of production and assist in adding value to products and services. In this sense, bearing in mind that the agro-industrial environment is one of the most competitive markets nowadays, several organizations tend to invest in relationships and partnerships in order to keep thriving through a series of processes, levels of coordination, cooperation, and collaboration in the increasingly globalized and dynamic market of modern life (Storer et al. 2014).

Value co-creation in agro-industrial services is a reality able to bring multiple benefits to companies, since value co-creation presupposes that companies have access to other companies' resources (Chowdhury, 2014). In our case study carried out on a cassava-based beer brewery in the state of Goiás, it was found that the brewery possesses all the necessary apparatus and industrial knowledge, while cassava farmers and the government agency only hold data on the state of Goiás and its population, in addition to all the knowledge amassed about it along the years.

The mutual benefits reaped from value co-creation generate opportunities for partner companies to strengthen the existing bond between them even further, thus culminating in greater development (Bonamigo et al. 2020)

Akaka & Vargo (2015) consider that companies strive to maintain a close relationship with their customers and members of a value co-creation chain on account of the mutual benefits capable of being achieved, given that they arise from interdependence or complementarity of relationships or by seeking access to knowledge, resources, markets and technology.

An example of a closer relationship between farmers and suppliers was analyzed by Liang (2017) through a study on how agrotourism and value co-creation produces positive results in both cases, given that customers can acquire knowledge through experience and contact with agro-industrial environments, while at the same time generating an important contributing factor to value co-creation, i.e. the feeling of belonging and engagement of customers with the agro-industrial company.

Hsu et al. (2011) consider that such a good relationship between customers and farmers is essential for achieving good value co-creation results, since the company tends to gain more notoriety due to seeking development and innovation in the way customers participate in services offered, which ensures greater competitiveness and encourages companies to remain competitive in the market and continue growing. A strong relationship cemented by the whole

production chain brings both individual and collective benefits to all those involved in value co-creation, which makes the partnership attractive and beneficial for all parties (Ateş et al. 2015).

Robertson et al. (2014) state that value creation occurs when a few factors are identified in integration systems, such as customer satisfaction, allocation of corporate resources in a given initiative, and an optimal alignment of service providers so that all parties can play their role in collaboration, therefore benefits are reaped by everyone.

However, participants might use their resources and information improperly. As a result, these companies would destroy value which in turn leads to a decline in at least one of the integration systems (Hsieh & Chen, 2017; Plé & Chumpitaz Cáceres, 2010). Thus, the concepts of shared-value creation allow envisaging companies and organizations as an analytical structure and considering the differences in how they create shared value to broaden understanding about partnerships (Haase, 2021).

According to Luo et al. (2019), most customers and stakeholders in collaboration act rationally, but Quach & Thaichon (2017), Makkonen & Olkkonen (2017) and Yang (2016) affirm that abusive behaviors or misguided and underdeveloped decisions might destroy value in the production chain, and such value co-destruction may arise from a negative public image projected by both companies, managerial positioning, corporate policies, and internal and external scandals, thus companies must develop a closer relationship with partners with whom they co-create value so as to reduce the likelihood of events as such, given that value co-destruction is associated with weaknesses in resource management within a company.

An example of such would be when a given company transfers materials, information and resources to another company, and the latter misuses the shared resources, either due to lack of organization or production capacity, therefore resulting in an unforeseen loss of expected products of the former and all other partners involved (Smith, 2013).

Thus, value co-destruction is a challenge to be faced in the context of value co-creation (Hogg, Werner, & Griese, 2021). Problems arising from value co-destruction are linked to the misuse of information, resources, and materials, as well as opportunistic attitudes by one of the partners, or even concerning the problems caused by lack of knowledge by actors, as they are unaware that certain attitudes and decisions might ruin the initiative. Therefore, when a company decides to start a value co-creation process, they must discuss optimal ways to improve themselves, in addition to keeping in mind how they are going to manage the partnership to avoid value co-destruction (Luo et al. 2019).

However, in a value co-creation relationship, network orchestration is a challenge, as it is aimed to restore relationships between companies, analyze how their joint and collaborative work creates value and improves integration between them by demonstrating how a change in some functions or in the way of interacting with partners and customers can offer innovative benefits to those involved (Hurmelinna-Laukkanen, Nätti, & Helin, 2014).

2.2 Network orchestration

In the search for development, companies are striving to develop new growth strategies, in addition to shifting the focus of their initiatives and innovations towards a greater expansion of their collaborative network to find new ways of interacting with their partner companies and modernize the way companies are regarded in the market (Nambisan & Sawney, 2011; Carlborg, Hasche, & Kask, 2021).

Due to a constant increase in international competition and market dynamics, companies are seeking partnerships to jointly create and achieve competitive advantages, as they allow understanding that the quality of value orchestration ultimately depends upon how the network of collaborators is managed and the manner in which all instances of value co-creation are connected so as to ensure the greatest efficiency of all actions (Shi & Shen, 2021)

Value orchestration is indirectly accountable for generating positive results from value co-creation, as all actors work jointly to solve problems by aiding each other. In this scenario, value orchestration starts the moment this partnership is established, as it depends directly on how well the partners interact with each other as a result of a transparent relationship that effectively co-creates value (Shulga et al. 2017).

In this sense, as observed by Shahabi et al. (2020), the ability of actors involved in orchestrating value co-creation is a crucial factor in exploiting the full potential able to be reached through these initiatives. Furthermore, the interactions between partners companies must be efficient and precise so as to avoid the occurrence of value co-destruction, as aforementioned.

Reypens et al. (2016) considers that the adoption of value co-creation requires a coordination of stakeholders and their activities within the production chain so that they are integrated in the most participatory way. In this sense, the traditional way of managing a production chain is improved, as more interactive, collaborative and widespread processes take place through a strategy called network orchestration (Dhanaraj & Parkhe, 2006).

In the view of Nambisan & Sawhney (2011) and Milwood & Roehl (2018), several factors affect the degree of network orchestration, such as the ease at which knowledge is disseminated, shared and used between partners. These authors state that companies must know how to assess the value of knowledge and shared ideas; they must also select those with the greatest potential within the initiative so as to achieve successful value co-creation and ensure an even distribution of income between participants, which is also proportional to each company's participation in order to avoid unfair advantages and profiteers.

Networks are orchestrated the moment companies invest in professionals to aid them in understanding the intricacies of partnerships to face the new realities of the modern world towards creating new learning and research opportunities in their context, in addition to broadening understanding about the current market scenario and strategies to be adopted by the company so as to remain updated and competitive while at the same time contributing to the growth of other companies (Mignoni et al. 2021).

2.3 Lean Thinking

The entire case study revolves around value co-creation in agro-industrial services considering a combination of practices and interactions between several companies seeking mutual development. In addition to value co-creation, an emergent practice named B2B (Business-to-Business) relationship is based on the lean thinking concept and encompasses a philosophy aimed to adopt practices within companies in such a way as to make a systemic adjustment in the overall functioning of production chains and eliminate unnecessary losses and costs, optimize the entire production chain, and create value for customers and clients (Shah & Ward, 2007; Borota et al. 2021).

In value co-creation, lean thinking practices must to be studied and adopted by as many employees as possible, since the greater the likelihood of unnecessary waste caused at some stage of the production process or while there is an interaction between actors, the more easily they can be avoided (Tortorella et al. 2018).

According to Argiyantari et al. (2021), lean practices are always aimed to minimize avoidable costs of a given process, so that the steps that add no value to the final product are constantly improved, hence providing customers with a product having the best value at the lowest cost of production, which boosts the production chain and enhances the results from value creation in this case study.

3 METHOD

According to Rolf (2007) and Rowley (2002), a case study is an important tool for understanding a study by efficiently evaluating both the proposed case and the context in which it is inserted. Yin (2014) considers it as a data collection strategy able to broaden understanding about the dynamics of an initiative by observing it from outside the scope of an institution impartially, given that information can be acquired even when there is little control over the scenario under study.

A single case study is sufficient once the case is considered typical of in a given area of study, as it provides several opportunities for knowledge acquisition (Mariotto, Zanni, & de Moraes, 2014). Thus, case studies aim to evaluate the events and complexity of collaboration in all its aspects in the most optimized way, so that results obtained and evaluated are as accurate as possible (Eisenhardt, 1989; Botti & Monda, 2020).

Therefore, this study aims to list the managerial implications arisen from an interaction between a brewery and a Brazilian government agency based on the principles of Lean thinking towards value co-creation. For such a purpose, the steps laid out by Cauchick (2010) were selected for the case study, which are: research protocol, empirical data collection and content analysis, which are going to be described as follows.

In the first step, a research protocol was created in which an invitation letter was sent to experts from the organizations involved and guidelines for its conduction, in addition to a semi-structured questionnaire within the scope of this research (Appendix A). Miles & Gilbert (2005) regard that semi-structured questionnaires are important as they provide room for discussion, both about the information necessary for the interviewer and important aspects that an interviewee can add to data collection. The questionnaire designed for this research was adapted from a research carried out by Bonamigo et al. (2017), which can be explained by having a similar scope and objectives to those set out in both our researches, i.e. both are carried out in the agro-industrial context.

An empirical data collection was performed in the second step. At this point, an online interview carried out with five managers who were the most involved in value co-creation, three representatives from the breweries and two for the government agencies (Table 1). Interviews were recorded to aid in the step of content analysis. Empirical data were collected from August to December 2021.

Table 1

Respondent's Profile

Interviewed	Company Description	Sector	Company Size	Interviewee's Position	Length of time working for the company	Interview duration
A	The largest Latin-American brewery. Its main mission is to boost the beverage industry and, together with society, make the world a better place to live in.	Brewery	Large	Process and product development	21 years	36:32
B	The largest Latin-American brewery. Its main mission is to boost the beverage industry and, together with society, make the world a better place to live in.	Brewery	Large	Logistics manager	8 years	46:53
C	The largest Latin-America brewery. Its main mission is to boost the beverage industry and, together with society, make the world a better place to live in.	Brewery	Large	Product manager	10 years	38:24
D	The largest Brazilian public agency for technical assistance and rural extension aimed to promote sustainable development in the municipalities of Goiás.	Public organization	Large	Development analyst	7 years	50:46
E	The largest Brazilian public agency for technical assistance and rural extension aimed to promote sustainable development in the municipalities of Goiás.	Public organization	Large	Technical assistance Director	5 years	41:59

Source: the authors

In the third step, a content analysis was conducted according to Bardin (2011), who states that content analyses should be carried out by taking rigorous steps using a series of analytical techniques to obtain indicators that broaden understanding about the conditions of cases under study. Thus, researchers can identify their characteristics and peculiarities, from the information obtained, evaluate their results and interpret how they affect the actors involved in them (Camara, 2013).

Based on Bardin (2011), its categories were defined a posteriori. These categories were considered as supporting elements involved in a value co-creation interaction listed by Bonamigo et al. (2020). Once empirical and tabulated data were collected, it was possible to organize them according to affinity. Subsequently the key element of implication was defined. The combination of ideas proposed in the current case study not only assist in understanding the case under analysis, but also leads to comprehending other initiatives within the agro-business sector so that multiple alternatives can be considered for the area under development in this study (Gibber et al. 2008)

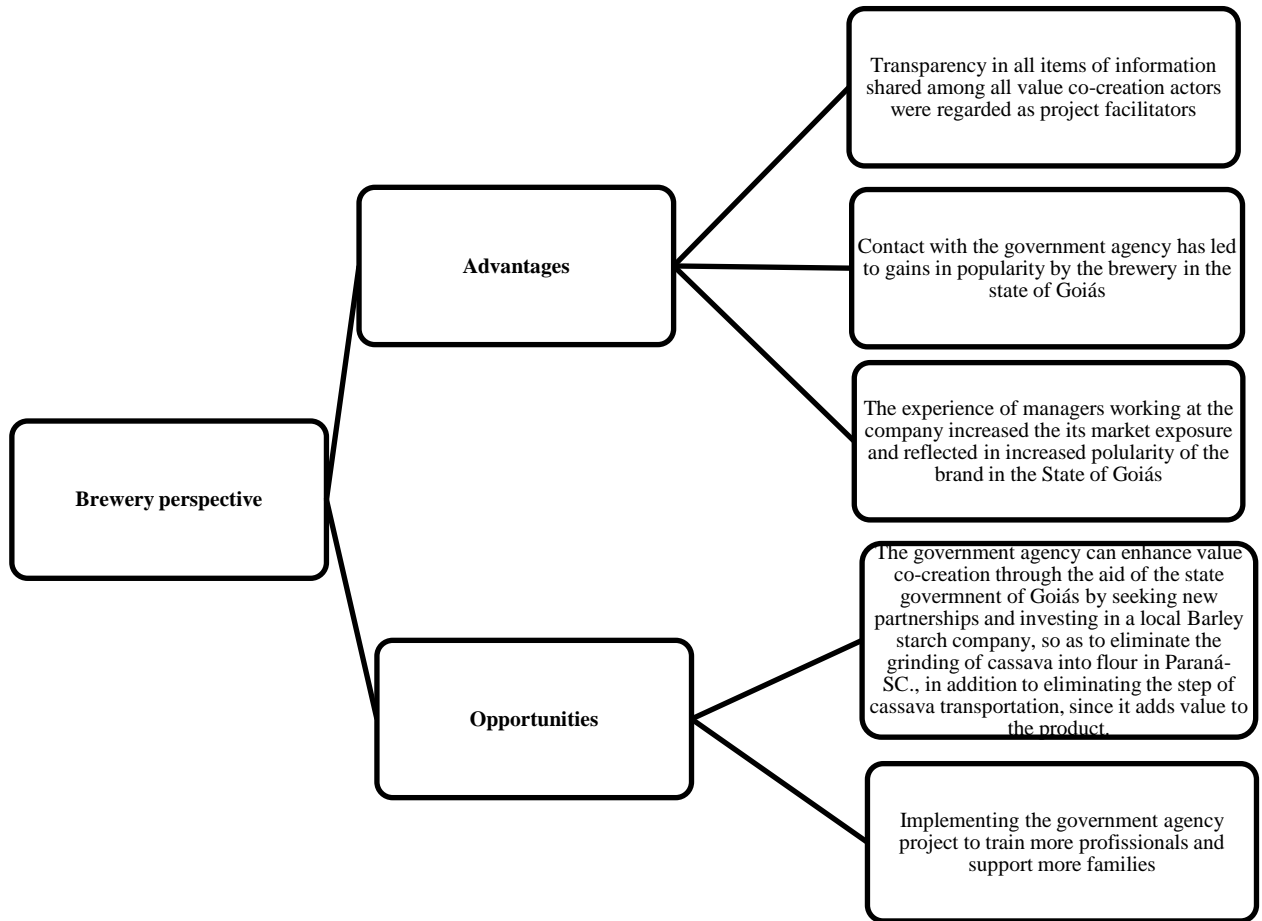
4 RESULTS

An analysis of interviews conducted with the brewery and the government agency managers revealed important aspects about their partnership, especially concerning how the innovation initiative is used by them, given that the logistics chain was structured consistently and efficiently which leads to achieving positive results more quickly and favoring expansion plans based on value co-creation.

The level of satisfaction by cassava farmers was approached by managers, who ensured the sale of their goods. It improved their quality of life and, with the aid of the government agency, the brewery was able to increase its productivity through genetically modified cassava and efficient machinery for production. Based on the content analysis, Figure 1 points out the managerial implications of the present case study by showing results and opportunities discussed with brewery managers, and Figure 2 depicts these results from the perspective of government agency managers.

Figure 1

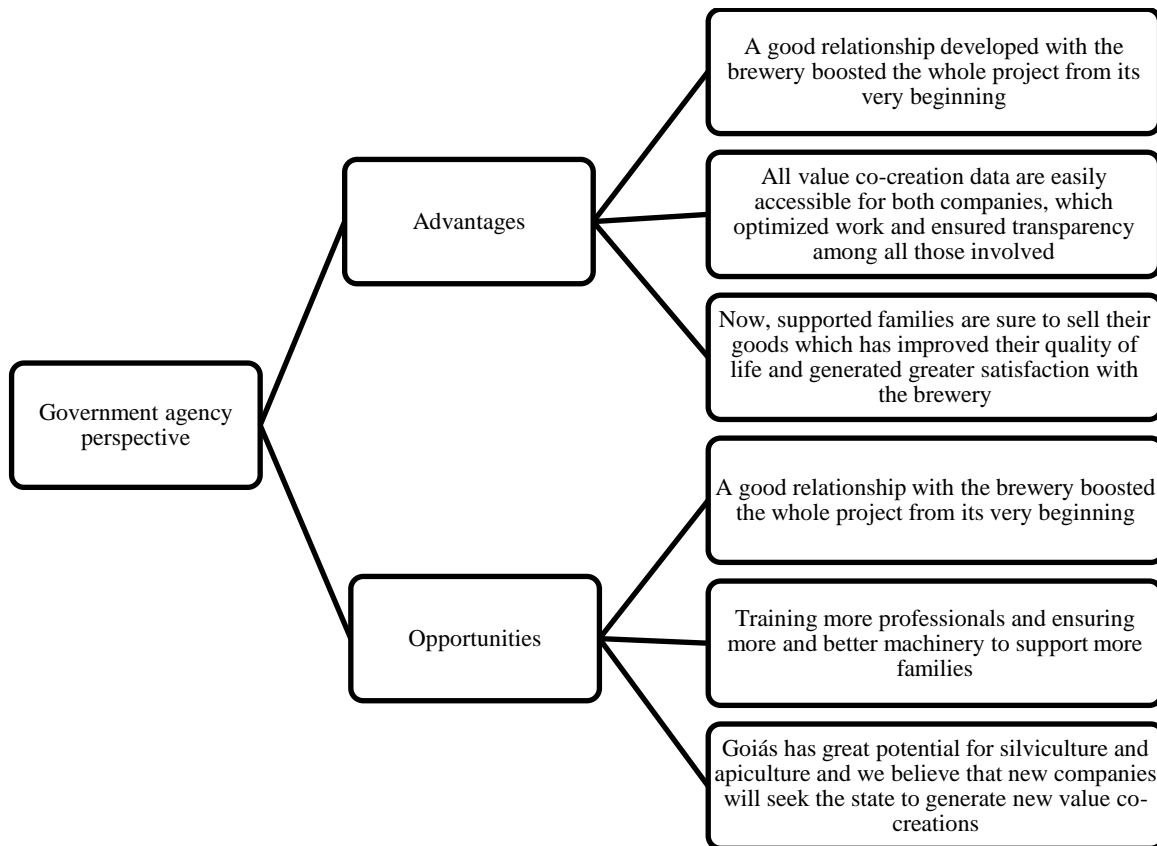
Managerial Implications from the perspective of Brewery managers



Source: The authors

Figure 2

Managerial Implications from the Government Agency perspective



Source: The authors

5 DISCUSSIONS

This section discusses the value co-creation results achieved from the interviews with managers of partner companies, which is divided into the following subsections: 5.1 Integration strategy, 5.2 Protection mechanisms and 5.3 Growth opportunities, in which the beneficial aspects of the initiative to companies are going to be addressed, as well as the project’s areas of improvement and means to achieve them, respectively.

5.1 Integration strategy

According to Grönroos (2011), both the production processes and interaction between organizations consist of different sub-processes, combined resources and coordinated investments within the whole production chain aimed to enhance efficiency and create value (Lusch & Nambisan, 2015; Löfberg & Kesson, 2018). In this study, the brewery and government agency collaborate throughout the process of producing cassava-based beer. According to A:

“The two companies have a very transparent relationship in terms of initiative data, registration, and information about families supported in the state of Goiás, as well as the next stages of value co-creation”

Dhanaraj & Parkhe (2006) state that transparency along with reciprocity and rapid problem solving among stakeholders are critical factors to the success of an endeavor. In a study carried out by Bonamigo et al. (2020), the involvement of companies in value co-creation, their synergy and mutual trust are some of the key issues organizations must focus on in order to facilitate value co-creation. Thus, both the brewery and government agency should trust each other as for the information about the value co-creation initiative, as it is one of the main factors enhancing its effectiveness, even within two years after its implementation.

This can be evidenced by Mignoni et al. (2021) who state that companies can only achieve growth if both parties trust that neither of them will use the information shared to their own advantage, or when they recognize their individual role in the partnership, or even when they work together in order to make their interactions transparent at all times. Once information is shared, improvement actions grounded in Lean Thinking should be introduced in the context of value co-creation (Ferenhof et al. 2018).

According to Vangen & Huxham (2009), it takes time to earn trust. In B2B relationships, companies tend to be wary of their interactions and trust the companies they have been working with the longest (Durugbo & Schwetschke, 2018). Given that the cassava beer project is recent and a partnership has been established between the brewery and the government of Goiás in 2020, companies have always had a friendly relationship with each other according to D:

“The fact that value co-creation takes place between two companies from different industries helps to create a bond between them more quickly, as they are not competitors in the beverage market in the region, not to mention the fact that it reduces the fear that both have about trusting each other with their knowledge”.

According to Thomä & Bizer (2012), most companies regard secrecy as one of the most efficient ways to protect their knowledge about other companies through patents or more sophisticated mechanisms requiring heavy investments. This can be evidenced when companies belonging to the same sector create value together. According to Adner & Kapoor (2010), a company is able to create value based on its ability to innovate, but leakage of ideas and projects is harmful to companies.

Since it is a principle of state organization to support small farmers, this barrier to innovation can be transposed by value co-creation in the partnership under study herein, therefore both companies can share information more safely than if both belonged to the same market or sector. This fact also assists in how the initiative is carried out, in addition to the sharing of information and technology between companies which in turn benefits value co-creation.

Grönroos & Helle (2010) report that providers must assist their customers in applying the services and solutions they provide into practice. As for the partnership studied herein, the government agency provides all support necessary for farmers to produce, harvest and load their trucks with cassava. In this sense, the weakest link in this initiative chain is the steady support provided throughout the beer production process, resulting in an effective interaction with the government agency. According to E:

“Growers are pleased with the progress made by the initiative. Many of them found it difficult to sell their goods, and now they can do so given that all cassava production is definitely going to be purchased by the brewery”

Understanding the customer's role in value co-creation is an important aspect of being a supplier (Komulainen, 2014). The brewery only provides the state of Goiás with the beer produced by it, thus eliminating an important stage of the production chain, i.e. beverage transport.

From this measure, the brewery, even if its consumer market reduces, strengthens its bond with the local population, since beer is marketed at a much lower price than the usual, thus generating value from the perspective of customers through the initiative results and influencing diverse performance indicators of value co-creation, such as financial and behavioral aspects, as well as customer satisfaction, in addition to stimulating integration between the actors of value co-creation (Arica & Çorbaci, 2020).

Therefore, the beverage becomes accessible to farmers, which strengthens the links to value co-creation by showing that the brewery is concerned about social development and cherishes the quality of life of local individuals (Bonamigo et al. 2022).

Song et al. (2016) considers that the relationship between the company and its customers is an important factor affecting the effectiveness of shared value creation. Although it was found that the brewery and government agency have a transparent relationship, if one of these companies had a bad relationship with the cassava farmers, it would be disadvantageous and the initiative would be doomed to fail.

Proposals such as increasing the number of supported families, mapping the state of Goiás in order to identify the regions requiring the greatest investment and assistance and allow farmers to consume the product they have contributed to producing with the purpose of honoring the relationship between the brewery and the farmers, given the fact that an investment in relationships between value co-creation actors implies investing in the development of the whole partnership (Song et al. 2016).

There are several interactions between the three actors of this value co-creation, such as the selection of regions in which the farmers are licensed in the state of Goiás, the availability of the best seeds, planting, harvesting and transporting cassava to the brewery trucks. As C said:

“As a whole, considering all aspects to be analyzed, the initiative has been beneficial to everyone, as both the brewery and the government agency are satisfied with the results and good prospects for improving relations. This shows that projects launched more quickly can achieve good results if well managed”

5.2 Protection mechanisms

Due to an increasing market complexity and the pace at which companies must innovate to remain competitive, as well as high production risks and costs involved, they tend to find external partners to co-develop products and benefit all parties (Bader, 2008; Bonamigo et al. 2021).

To protect themselves from possible malicious acts performed by other companies, companies tend to create mechanisms to secure their intellectual property rights (IPRs) using patents and copyrights on their trade secrets. It worth mentioning that companies having IPRs feel safer by creating value together and partnering with other companies, since they are exposed to fewer risks (Olander et al. 2014).

In the case of cassava-based beer, although partner companies have a transparent relationship, they safeguard their information, as noted by D:

“All data on the partnership can be accessed by both parties. In the case of registration of supported families, the brewery holds all this information, but as an agency representative, I can request the head of the brewery to send me data on it at any time, as it has already happened during the two years of our cooperation”.

Hall et al. (2012) states that protective mechanisms used by companies depend on several factors, such as the size of the company, its importance and previous shared value

creation experience. The brewery is one of the most important beverage industries in Brazil, thus it would naturally be fearful of information sharing with its partners.

However, the regional development project proposed by the brewery has been ongoing since 2018 in five Brazilian states, and the brewery has achieved good results from its implementation, as a significant increase was observed in family farming aiming at beer production using local feedstock, which is an important source of income for families according to B:

“These positive experiences are factors encouraging the brewery to continue its value co-creation projects and involve more and more families in partner states”.

According to Laukkanen (2011), intentional or unintentional leakage of information is a risk to be recurrently faced by Research and Development (R&D) companies. In the case under analysis, R&D groups of the brewery and government agency collaborated to develop genetically enhanced cassava roots using higher carbohydrate percentages in order to make its roots more efficient. According to interviewees from both companies, there were no problems arising from the sharing of information and techniques.

Vasconcellos & Silva (2018) consider that many technological and innovative advances are constantly being made to prevent leakage or unwanted exchange of information between companies, as they ensure the economic and technological growth of several countries and companies with various economic partners.

Bonamigo et al. (2020) reports a series of negative attitudes in the context of value co-creation generating distrust over time between the involved actors. Once they no longer trust each other, the initiative is doomed to fail. According to these authors, mistrust can arise from lack of synergies between companies, opportunistic attitudes and incompatibility of organizations in certain areas, which affects all participants of these relationships.

According to Hanna & Robertson (2015), one way to gain trust between organizations is directly related to the level of commitment from both parties. Thus, actions by the brewery and government agency aimed at transparency in decision-making and finding new proposals and growth opportunities for the initiative reveal that both are truthfully committed to the initiative and are willing to keep creating value and develop together with the farmers in the state of Goiás.

5.3 Growth opportunities

Competitiveness, collaboration and the sharing of knowledge between actors of the initiative are the most important aspects to be considered in value co-creation towards growth and development (Liu & Lai, 2011; Zhao et al. 2017; Leclercq et al., 2018). In this sense, C observes that:

“There is an important contribution in all relations comprising the initiative, as ideas and knowledge are shared among all, from the experience of farmers regarding the best techniques for planting and harvesting cassava, to the help and research provided by the brewery together with the government agency regarding the use of genetically modified seeds”.

According to Song et al. (2016), companies must collaborate strategically within the partnership in order to thrive and create the greatest value together. The communication and attitudes by actors participating in the initiative should comprise the entire production chain so that all parties are connected to explore the benefits of sharing knowledge, as it is in the cassava-based beer production chain and approached in the previous sections of this study.

Partnership success is also a factor achieved based on the perspective of managers from the brewery managers and government agency. A pointed out that:

Results are being achieved much more quickly than expected through the initiative. Even though the brewery already has regional development programs in other Brazilian states, the fast pace at which results are being achieved in Goiás is beyond our expectations.

In 2018, the brewery launched its regional development program in some Brazilian states, including Ceará, Maranhão, Pernambuco, and Piauí (Borgaco, 2021). According to the author, in some places as Pernambuco, the market share (the percent of total sales in an industry generated by a particular company) of beer produced using local feedstock was over 70%.

This reality reveals that the initiatives not only assist farmers but also play an important role for the brewery by increasing its influence in regions where there has never been value co-creation, in addition to driving the economy to other states, either directly and indirectly, since many other companies are involved in the production chain.

According to A and B, the two companies work together to serve a significant amount of families. More than 24 counties in Goiás are already encompassed by value co-creation, and several families benefit from it. According to D:

“The two companies should adopt some measures to make the initiative even more efficient. The cassava plant collected in Goiás by the brewery's trucks is taken to starch manufacturing plants in Santa Catarina, Brazil, so as to make starch. This step not only incurs many costs due to over 2.800km of distance to be covered, but also leads to delays in beer production, therefore it must be performed rather quickly”.

Since cassava is perishable and spoils within 48-72 hours after being harvested (Lorenzi, 2003), B believes that government partnerships with the private sector could assist in the construction and use of a starch manufacturing plant in Goiás, which would considerably reduce transport costs, in addition to preserving the quality of cassava and ensuring faster beer production.

For cassava farmers and B:

“The initiative can always be improved through investments in research and development, new cassava varieties and machinery to help growers cultivate, manage and maintain harvest production, as well as strengthening relationships between companies so that they can share ideas about new products and branches able to be achieved through the partnership, and achieve greater investment by the Goiás government in training more professionals to support growers”

Imai (2021) considers that the adoption of more efficient thinking in both approaches should always be sought through value co-creation, constant investment in technologies at the highest level, and the adoption of less costly techniques. The cassava beer initiative fits into the Lean concept, as cassava production stakeholders are using modern technology and carry out constant research into the best roots to ensure higher carbohydrate content in cassava.

Combined with planting and harvesting techniques monitored by the government agency to achieve the highest productivity at lower operating costs, the use of the best seeds is a project that is currently being developed in order to increase the yield of all cassava-producing farms.

In Goiás, other opportunities for partnerships with the government are emerging. The excellent results achieved in only two years reveal that the project is well managed by companies, i.e., a fact confirmed by E confirms through his statement:

Goiás is a region with enormous potential for apiculture and silviculture. These characteristics can be used to develop the region, both regarding the brewery and other companies interested in the way the initiative is carried out in the region. Such

potential can be exploited in many ways and the success of the initiative with the brewery opens doors to new projects and products, in addition to the fact that local feedstock can be used.

Due to the technology available and ease of contacting companies and managers, transparency is promoted through the initiative according to Lai et al. (2017); Eloranta & Turunen (2018) state that data on value co-creation is shared in an agile way thereof, which makes it easier for both parties to keep in touch about the partnership, as well as innovating, changing, finding new materials to be used and proposing new strategies for such a purpose.

These ideas by the farmers and state agents are in line with the proposals made by Luo et al. (2019) and Imai (2021) who are always striving for growth, innovation and designing new projects, which explains why such partnership is thriving. Business leaders are aware of the areas to be approached and steady growth is expected from such partnership.

6 CONCLUSIONS

This study aimed to list the managerial implications arisen from the interaction between a brewery and a Brazilian government agency from perspective of value co-creation. A Lean approach to value co-creation added enormous value for customers and partners, which was possible via innovations and partnerships, such as a mutual cooperation between actors and complementary resources. Thus, this section is divided into three subsections: 6.1 Theoretical contributions, 6.2 Managerial contributions and 6.3 Limitations and future studies.

6.1 Theoretical contributions

From the perspective of innovation in agro-industrial services and based on the findings of this study, it fills gaps in literature on value co-creation in the service sector. Therefore, a list of insights to enrich literature on value co-creation in agro-industrial services is compiled. In addition, theoretical gaps are identified in research on lean management of value co-creation in the agro-industrial sector.

Its findings also demonstrate practical implications regarding the complementary resources between actors of the brewing sector arising from value co-creation, which is an emerging field in current literature. Thence, the present study allows guiding researchers to deepen understanding about value co-creation management in the agro-industrial sector.

Additionally, value co-creation offers great advantages and competitive stimulations by collaborative partners, especially in terms of sharing information and knowledge between agro-industrial actors.

6.2 Managerial contributions

Based on its findings, it is possible to observe a positive impact arising from value co-creation throughout the state of Goiás, as networking is orchestrated between the partners involved in this project. Positive results were achieved, such as the collaboration between the brewery and the government agency in generating genetically enhanced cassava roots, new growth proposals and a gradual increase of families benefitting from this initiative.

Thus, the actions taken by the brewery and government agency focus on the regions in need of assistance and development so that the population can produce cassava and take it to the company's trucks. It also highlights the benefits generated by the brewery, such as increasing its influence in the Goiás state, strengthening its social role in the region, and fostering project development in the region.

Based on the research findings, it was understood that there is significant innovation arising from the interaction between parties, both by the government agency to support farmer, in order to ensure that they have full access to the best seeds (stems) researched by the brewery and necessary production machinery, as for the brewery that invests in research on the best cassava seeds aiming to improve the initiative in the State of Goiás and assist a greater number of families through this project.

The fact that the brewery only makes beer available in the state of Goiás at a low cost strengthens the company's social role in the region via value co-creation.

6.3 Limitations and future studies

Given the managerial implications arisen from value co-creation in Brazilian agribusiness from the perspective of Lean Thinking can be applied through other methods so as to evidence the elements listed herein, as well as the identification of new elements.

In addition, future studies should be conducted in other agro-industrial sectors besides the brewing sector, and comparative studies should be conducted /or those aimed to identify practical improvements adopted towards value co-creation among multiple agro-industrial actors from the perspective of Lean Thinking.

Once the factors implied in value co-creation are identified in the brewery production chain under analysis, opportunities for future studies are identified. The first of which involves

measuring the impact of network orchestration on good relationships between partners from the Lean Thinking perspective. Another opportunity is to propose ways to manage value co-destruction risks in brewery production chains, and another option is to propose a management model for value co-creation between actors involved in brewery production chains based on the Lean approach.

Authors' contributions

Contribution	Borota, F. R. D.	Bonamigo, A;	Andrade, H. S.
Contextualization	X	X	---
Methodology	X	X	---
Software	---	---	---
Validation	X	X	X
Formal analysis	---	---	---
Investigation	X	---	---
Resources	---	---	---
Data curation	X	X	---
Original	X	X	X
Revision and editing	X	X	X
Viewing	---	---	X
Supervision	---	X	X
Project management	---	X	X
Obtaining funding	---	---	X

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