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How a Mobile App Can Become a Catalyst for Sustainable Social Business: The Case of Too Good To Go

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How a Mobile App Can Become a Catalyst for Sustainable Social Business: The Case of Too Good To Go

Abstract

Information and communication technology (ICT) plays a vital role in sustaining social businesses. However, little is known about how a mobile app can be a catalyst for sustainable social business. Guided by the technology affordance theory and service-dominant (S-D) logic, the present study aims to address this research gap by examining both the perspectives of providers and users, using the Too Good To Go (TGTG) app – the largest social movement in Europe – as a case study. Semi-structured interviews were conducted to explore the congruence/gap between customer value proposition (CVP) and value-in-use (VIU). The findings highlight that social, functional, and emotional values are the success factors for the TGTG app to accomplish its social missions of reducing food waste and CO₂ emissions and allowing everyone to access quality food at an affordable price. The theoretical and practical implications of this study and directions for future research are also presented.

Keywords: Social business, Mobile app, Too Good To Go (TGTG), Customer value proposition, Value-in-use, Perceived values

1. Introduction

Over the previous years, there has been increased corporate as well as scientific involvement in corporate social responsibility (CSR) activities. CSR covers organizations' policies and initiatives to achieve sustainable economic, environmental, and social development (Aguinis and Glavas, 2012; Vo-Thanh et al., 2021a). CSR is also understood as “any ‘responsible’ activity that allows a firm to achieve sustainable competitive advantages, regardless of motive” (McWilliams and Siegel, 2011, p. 1480). Considering the CSR, firms adapt and reinvent their business models accordingly. Thus, CSR has been regarded as essentially a corporate-centered approach (Ansari et al., 2012; Peerally et al., 2019; Vo-Thanh et al., 2021a). Social business (SB), which is defined as a process “that creates innovative solutions to immediate social problems and mobilizes the ideas, capacities, resources, and social arrangements required for sustainable social transformations” (Alvord et al., 2004, p. 262), could be an effective way to solve social problems. In line with Alvord et al. (2004), Carraher and Welsh (2015) describe SB as a “process involving the innovative use and combination of resources to pursue opportunities to catalyze social change and/or address social needs” (p. 370). In this sense, businesses must create strategies to confront the foremost social and economic challenges and to improve, as such, the quality of life for the region where they are located (Godar et al., 2005; Ribeiro-Soriano, 2017).

Particularly during global crises such as the COVID-19 pandemic, SB can play a significant role in the socio-economic development of communities (Akbulaev et al., 2019; Batat, 2020; Ramani et al., 2017; Spieth et al., 2019). First, SB contributes to creating numerous positive factors, such as a favorable business environment, innovation, active citizenship support, and public solidarity, as well as conditions for a timelier crisis and more flexible recovery. Second, finding a solution to current social challenges is valuable to society at large (Akbulaev et al., 2019; Spieth et al., 2019). For example, during the COVID-19 pandemic, Michelin-starred restaurants have developed dynamic capabilities while playing a social role through developing new forms of business practices to enhance individual and collective well-being and to tackle social issues. Specifically, three main response strategies have been adopted by Michelin-starred restaurants, including philanthropic activities cultivating the well-being of communities, initiatives centered on consumers' food well-being, and socially responsible business practices to support the foodservice actors (Batat, 2020). Nonetheless, according to Peerally et al. (2019), the main value-creating purpose of SB consists of maximizing profit for optimizing socio-economic benefits. Similarly, Sansone et al. (2020) show that business ethics, CSR, and social impact measurements are perceived as more

important by social incubators compared to other incubators and that, in terms of economic objectives, social incubators are as efficient as other incubators. However, SBs' sustainability faces a dual challenge: achieving the social mission on the one hand and responding to market needs on the other (Rey-Martí et al., 2016; Shams et al., 2018). Thus, investigating how SBs can meet both their social mission and their market requirements is imperative to improve their effectiveness (Santos et al., 2015; Sepulveda et al., 2018). In this regard, previous studies (e.g., Gouvea et al., 2018; Lamine et al., 2018; Luthra et al., 2017) suggest that information and communication technology (ICT) can balance the social mission and market needs of SBs. Gouvea et al. (2018) found that ICT has a significant effect on environmental sustainability. Lamine et al. (2018) outline the emerging role that technology business incubators have as bridging mechanisms and drivers of sustainable regional development. Luthra et al. (2017) emphasize the effective management of ICT to meet the three pillars of sustainability, namely economic, ecological, and societal development. Pan and Zhang (2020) argue that it is necessary to create designs and knowledge for digital sustainability, which entails a trans-disciplinary approach of implementing digital technologies in resolving sustainability issues. From a broader perspective, digital technologies can make digital entrepreneurship more sustainable through social and environmental value creation. Specifically, digital technologies enable novel configurations of sustainable business models, such as integrative value creation, blended value proposition, and multidimensional value capture (Apostolidis et al., 2021; Gregori and Holzmann, 2020; Shams, 2016). Digital entrepreneurship has also been promoted as an excellent way for potential entrepreneurs to overcome rigid institutional environments, including gatekeepers, thereby leading to lower barriers-to-entry for all (Ben Youssef et al., 2020). However, little is known about how ICT can effectively contribute to SBs' sustainability initiatives. Drawing upon the technology affordance theory and service-dominant (S-D) logic, this study aims to address this gap by examining both the perspectives of providers and users, using the anti-food waste mobile app Too Good To Go (TGTG) – the largest social movement in Europe – as a case study. To understand how TGTG can contribute to SBs' sustainability, semi-structured interviews were conducted to explore the congruence/gap between customer value proposition (CVP) and value-in-use (VIU) as well as TGTG's functional, emotional, epistemic, social, and conditional values (Sheth et al., 1991).

According to the Food and Agriculture Organization of the United Nations (FAO) (2020), one-third of the food produced in the world for human consumption is lost or wasted every year, which is approximately 1.3 billion tons. The issue is not only the food that is wasted but

also the squandering of other resources, such as land and water, that are involved in food production and the carbon footprint of food waste, which FAO (2020) estimates to be 3.3 billion tons of CO₂ each year. This waste primarily occurs in the two stages of the food supply chain: the early stage (e.g., food processing and manufacturing) and the later stage (e.g., retail and consumption). In developing countries, 40% of losses occur at the early stage, while, in industrialized countries, more than 40% of losses occur at the later stage (FAO, 2020). In line with our research objective, we only focus on the later stage of food waste, as it represents the main source of food waste and the higher proportion of avoidable loss, that is, food that could be redistributed or sold elsewhere by applying appropriate strategies (Apostolidis et al., 2021; Papargyropoulou et al., 2014). The most responsible actors for food waste at the later stage include markets, grocers, bakers, supermarkets, household, and food services such as restaurants, cafes, and other institutions such as schools and hospitals (Papargyropoulou et al., 2014). FAO (2020) has also identified a lack of coordination between actors in the supply chain as a significant contributing factor to food waste.

The development of ICT has radically changed the food lifecycle, with numerous food-sharing and redistribution websites and apps emerging (Apostolidis et al., 2021; Davies and Legg, 2018; Harvey et al., 2019; Ray et al., 2019). Most previous studies have investigated the use of ICT either as a food-sharing tool (e.g., Harvey et al., 2019) or as a behavior-changing tool to reduce household food waste (e.g., Farr-Wharton et al., 2014), why people use food delivery apps (e.g., Ray et al., 2019; Zhao and Bacao, 2020), and consumer attitudes and purchase intentions toward food delivery platform services (Chen et al., 2020). However, few studies have explored the use of ICT (e.g., mobile apps) as a tool for food recovery from catering services and restaurants (Apostolidis et al., 2021).

Since its creation in 2016, TGTG has saved 8.3 million meals in France. The TGTG movement is raising awareness not only among retailers and adult consumers but also among children by presenting their movement in more than 500 schools. Thus, it is crucial to explore how an anti-food waste mobile app can effectively reduce food waste by satisfying three different groups (i.e., the app provider, retailers/restaurant owners, and customers). Like other anti-food waste apps (e.g., DamaGO in South Korea), TGTG has a social impact, in addition to reducing food waste, by helping businesses to donate their surplus food to charities, particularly to homeless people. With the TGTG app, one can make a donation to an association and participate in marauding with volunteers and TGTG's members. The donated money allows charities to offer food, clothing, and any basic necessities to those in need (TGTG, 2021a). Based on the conception of SB forwarded by Alvord et al. (2004) and

Carraher and Welsh (2015), TGTG acts as a veritable SB through proposing innovative solutions and combining resources to catalyze social change and address social needs. This study highlights how the TGTG app can be a catalyst for sustainable SB through (1) minimizing food waste, (2) reducing CO₂ emissions, (3) serving society by allowing everyone to access quality food at an affordable price and by addressing social needs, and (4) generating revenue.

The contributions of this research are not only theoretical but also practical. Theoretically, this study is exceptional in its use of a different theoretical posture (CVP vs. VIU) to examine how a mobile app can contribute to achieving sustainability for an SB. This research also suggests that the technology affordance theory and S-D logic are highly relevant in investigating the research objective. Practically, based on the findings, this research provides recommendations to improve the effectiveness of mobile apps with a social mission similar to TGTG.

2. Theoretical Background

2.1. Technology Affordance Theory

Based on the ecological approach, the concept of affordances was developed by Gibson (1977, 1979) to understand human perception. This concept was then popularized in the human–computer interaction community by Norman (1988), who conflates two important but different processes: designing the utility of an object and designing the way in which that utility is transmitted to the user. Later, Norman (1998) recognized the confusion and distinguished “*real* from *perceived* affordances” (p. 123). From this perspective, the technology affordance theory accounts for the fact that individuals understand and approach technology differently (Lei et al., 2019). In other words, technology affordance denotes what an individual with a particular purpose can do with a technology (Majchrzak and Markus, 2013). Different perceptions of technology’s usefulness by users depend heavily on their specific characteristics, objectives, and context of use (Kirova and Vo-Thanh, 2019; Lewis et al., 2003). Vargo and Lusch (2004) highlight that customers’ VIU can be different from service providers’ value propositions. For a mobile app, the service provider proposes values to the customer, but it is the latter that judges whether these values are beneficial (Lei et al., 2019). Rather than embedded in the physical artifact, the value of a technology is shaped by how users perceive and use it to achieve their own objectives (Grönroos, 2008; Kirova and Vo-Thanh, 2019; Lei et al., 2019). Hence, the technology affordance theory implies that the use of mobile apps is dependent on users’ perceived affordances of app functions and their

context-based interactions with the app (Lei et al., 2019). However, as underlined by Apostolidis et al. (2021) and Lei et al. (2019), while designing their mobile apps, service providers incorporate their assumptions about customers' perceived affordances, even though they do not really know whether customer use aligns with these assumptions. It is, therefore, vital to investigate the views of different actors within the exchange process, as congruent perceptions of the offering's values can generate meaningful interactions and value creation, while avoiding the destruction or diminishment of its values (Apostolidis et al., 2021).

2.2. Customer Value Proposition

Value is central to consumption and the constitution of markets (Gollnhofer et al., 2019; Holbrook, 2006; Zeithaml, 1988). In marketing, although scholars frequently refer to CVP, no comprehensive examination covers the concept from its origin to its contemporary role (Chandler and Lusch, 2015), and even today it remains poorly defined (Ballantyne et al., 2011). In addition, Anderson et al. (2006) underline that no common definition as to what constitutes a CVP exists.

However, Payne et al. (2017) suggest three CVP perspectives: supplier-determined, transitional, and mutually determined. The original CVP concept illustrates a supplier-determined perspective (Payne et al., 2017). Accordingly, the CVP was originally defined as a statement of how the firm proposes to offer superior value to customers and differentiates itself from competitors (Payne et al., 2017). Similar to a VIU perspective, the transitional CVP perspective underscores understanding customers' perspectives and experiences during usage (e.g., Grönroos and Voima, 2013). Hence, the firm engages in dialogue with the customer to identify attributes of value to them. According to Payne et al. (2017), this transitional perspective "presents a unidirectional emphasis, such that the firm determines the value, and the CVP sets out an offer that accounts for the customer's experience" (p. 472). The mutually determined CVP perspective takes into account that the CVP is co-created, which is especially relevant to business-to-business (B2B) markets (Payne et al., 2017; Shams and Kaufmann, 2016). This perspective involves reciprocal benefits offered to and from suppliers and customers (Ballantyne, 2003). It may also reflect social and environmental concerns (Payne et al., 2017).

2.3. Value-in-Use

From a consumer's perspective, value is created by consumers based on their consumption experiences and perceptions; in other words, no value is embodied in the product or service

offering, but instead value only emerges in use (Grönroos, 2008). This claim has been supported by S-D logic (Vargo and Lusch, 2004). As value emerges in use, scholars have regarded customers' perceived value as VIU (Apostolidis et al., 2021; Kowalkowski, 2011; Lei et al., 2019; Vargo and Lusch, 2008). In other words, VIU is the cognitive evaluation of the consumption experience (Sandström et al., 2008). VIU is, therefore, created by the customer (Grönroos and Voima, 2013), who interacts with resources acquired from the provider, such as during the usage of a mobile app. Heinonen et al. (2010) refer to customer-dominant logic, since the customer plays an active role in the process of VIU creation.

Moreover, for a mobile app – a usage-based offering, the customer gradually develops knowledge and skills through usage, which increases its value. Using a mobile app like TGTG also allows customers to benefit from network effects, which can increase its value through the addition of more users and restaurateurs. Therefore, the concept of VIU is of great importance (Bruns and Jacob, 2014).

Given that there are few studies on customers' use experience with mobile apps (Lei et al., 2019) and a lack of consensus on CVP and VIU (Ballantyne et al., 2011; Heinonen et al., 2010), this research aims to explore both concepts by combining the perspectives of providers and users.

2.4. Perceived Value

The concept of perceived value has been highlighted as a source of competitive advantage (Holbrook, 2006; Zeithaml, 1988). Perceived value is a subjective evaluation that can be appreciated before, during, and after a purchase (Coutelle-Brillet et al., 2014). According to Zeithaml (1988), perceived value is defined as the consumer's overall assessment of the utility of a product based on perceptions of what is received (benefits) and what is given (costs). However, Zeithaml's (1988) approach is habitually deemed through a simple price/quality compromise using utilitarian and economic elements (Coutelle-Brillet et al., 2014). Holbrook (2006) considers value a comparative, situational, and personal preference that characterizes a consumer's experience while interacting with any product or service, even though the value of a product or service can be perceived before its purchase (Coutelle-Brillet et al., 2014). Other scholars (e.g., Jamrozy and Lawonk, 2017) also provide empirical support to the inclusion of an affective aspect in determining perceived value. Therefore, a multidimensional conceptualization of perceived value seems more appropriate and must be considered in the present study to adequately capture the nature of value, which contains both cognitive and affective aspects (Holbrook, 2006; Sheth et al., 1991; Sweeney and Soutar,

2001). Moreover, according to Jamrozny and Lawonk (2017), measurements of a service's perceived value are complex because of its intangible, inseparable, heterogeneous, and perishable characteristics.

The dimensions of perceived value are often functional, emotional, epistemic, social, and conditional (Jamrozny and Lawonk, 2017; Sheth et al., 1991; Sweeney and Soutar, 2001). Thus, this study mobilizes a five-dimension framework, including functional, emotional, epistemic, social, and conditional values, which was developed by Sheth et al. (1991). This conceptual framework, which has been widely used in previous studies (e.g., Jamrozny and Lawonk, 2017), guided our exploration of the perceived value of the TGTG app. This framework was chosen because of its capacity to (1) assess various types of value of an offering within the service context and (2) capture both cognitive and affective aspects.

First, the perceived value may be functional, which aligns with Zeithaml's (1988) perspective of a quality/price tradeoff. Quality-based functional value is the utility acquired from the perceived quality and expected performance of a product or service (Sheth et al., 1991; Sweeney and Soutar, 2001). As for the TGTG app, its functional value may include customized services, service rapidity, real-time customer support, and value co-creation. For a mobile app, value co-creation is omnipresent, as customers are always interacting with firms via their apps (Apostolidis et al., 2021; Ramaswamy and Ozcan, 2018).

Second, the perceived value may be emotional. Emotional value is the utility derived from customers' feelings or affective states that a product or service evokes (Sheth et al., 1991; Sweeney and Soutar, 2001). Emotional value refers to well-being, pleasure, happiness, and self-development (Coutelle-Brillet et al., 2014). Affective states elicited by a mobile app, such as pleasure and empathy can have a positive effect on its perceived value.

Third, the perceived value may be epistemic. Epistemic value is defined as the capacity of products and services to arouse curiosity, deliver novelty, or satisfy a desire for knowledge (Sheth et al., 1991). As using TGTG would be a new experience for customers/restaurateurs, its capacity to satisfy a desire for knowledge or arouse curiosity should not be overlooked. From this perspective, TGTG may meet customers'/restaurateurs' desire for knowledge, novelty, and curiosity because of its trendy aspect.

Fourth, the perceived value may be social. Social value is associated with the gain derived from the product's ability to enhance costumers' social self-concept (Sweeney and Soutar, 2001) or their acceptability in various social groups after purchasing the product or service (Sheth et al., 1991). Coutelle-Brillet et al. (2014) indicate that the social value of service innovation in a B2B context helps to promote the company's image. Kataria et al. (2016)

suggest that there is a social value that customers perceive from sustainable brands. Therefore, for TGTG's users, social value may be interacting with and/or impressing their companions or other users through buying leftovers from restaurateurs. For restaurateurs, social value may be promoting their brands' image or interacting with customers and other stakeholders (Batat, 2020; Hasan et al., 2021a).

Fifth, the perceived value may be conditional. Conditional value refers to when someone faces a specific situation and then decides whether to change their behavior depending on the new circumstance (Sheth et al., 1991). When ICT impacts companies' competitiveness and customers' purchase behavior (Karjaluo et al., 2019), services' digitalization is incontestably an added value. For example, services' digitalization could be user-friendly, meet customers' needs in terms of technology applications such as a digitalized interactive platform, enhance customer satisfaction, improve efficiency and accuracy for restaurants by saving time and reducing food waste, diminish human errors, and provide customer feedback.

3. Methodology

3.1. Research Design

We adopted an interpretivism research paradigm and a qualitative research approach to explore CVP and VIU. Indeed, understanding customers' VIU and providers' reasoning behind the app design requires research approaches that "obtain deep insights through eliciting human interpretations of their perceptions and behaviors" (Lei et al., 2019, p. 3).

Moreover, we chose the case study approach because it is the most appropriate for our "what," "how," and "why" questions. The case study strategy should be mobilized when such questions are posed about a contemporary set of events over which the investigator has little to no control (Yin, 2014). As the main objective of this research is to explore CVP and VIU by combining both the perspectives of providers and users (i.e., customers and restaurateurs), the case study approach is particularly relevant. We purposefully opted for a single case study design by choosing the TGTG app, as this app relates to the research question of how an app can become a catalyst for sustainable SB. According to Saunders et al. (2015), purposeful sampling is often used in case study research, usually requiring only a very small sample, and this form of sampling is suitable to select cases that are particularly informative.

Based on the research objective, a conceptual framework (Fig. 1) capturing CVP and VIU was developed. Regarding VIU, we investigated both the perspectives of restaurant managers and customers. We focused on users' interpretations of the TGTG app's functions, motivations for using them, and resulting values. Regarding CVP, we aimed to understand the

provider’s expectations of customers’ use and the current mobile app design’s types of value. The research design aimed to identify any congruence and/or gap between the three groups and the reasons behind their cognitive thinking.

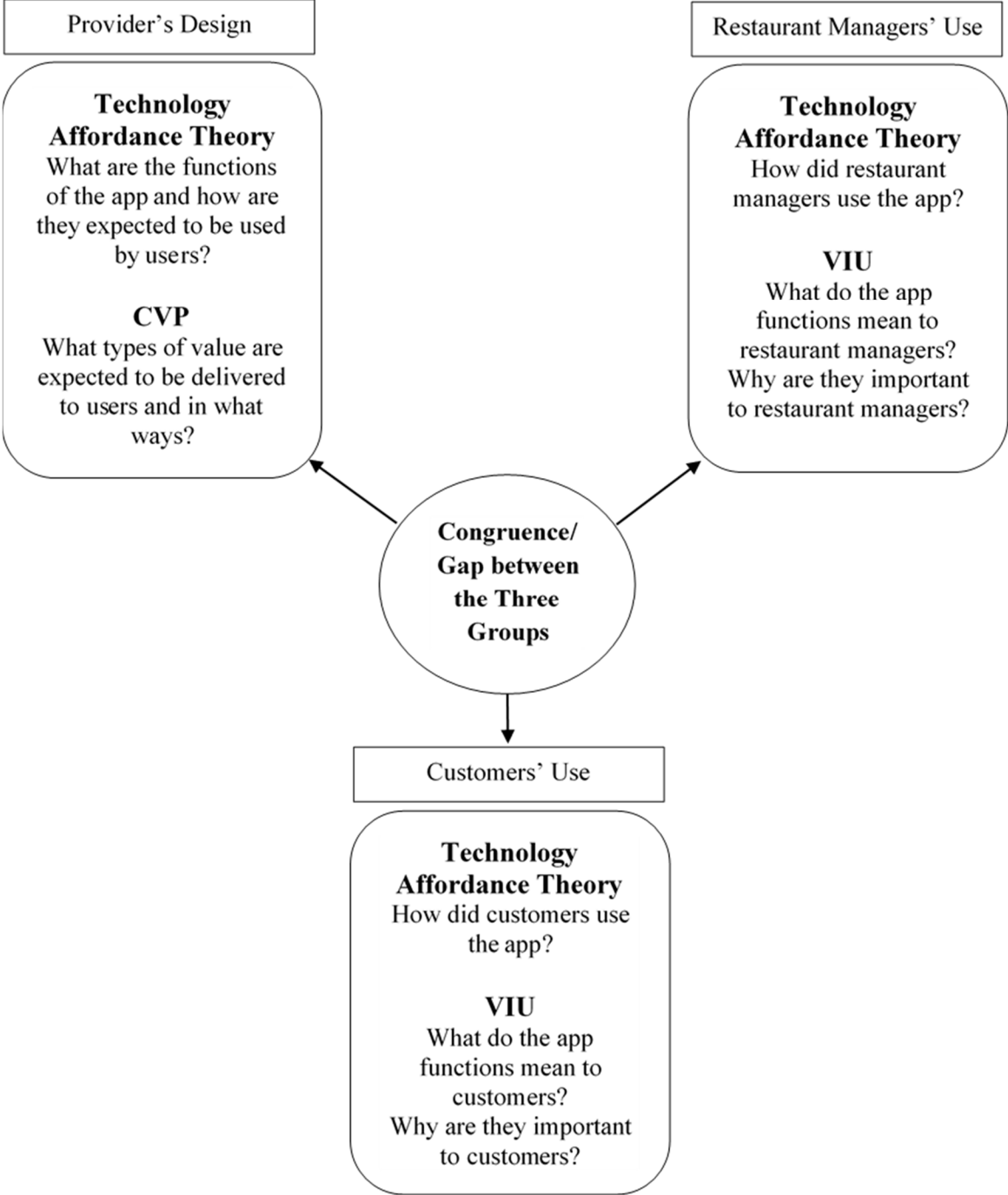


Fig. 1. Conceptual Framework (Adapted from Lei et al. [2019]).

3.2. Presentation of the TGTG App

One third of the food produced in the world is wasted. From this fact, the TGTG app was initially launched in June 2016 in France by Lucie Basch, who was chosen as “Femme d’Influence 2018 – Economique Espoir” (Génération Femmes d’Influence, 2018). TGTG is the leading app in fighting against food waste. The objective of the app is to create a link between customers and producers so that producers can sell their leftovers rather than throwing them away. The ultimate goal is “zero waste.” In the beginning, the app allowed people to engage with the fight against food waste on an individual scale by having fun. According to the TGTG website (TGTG, 2021b), the app is currently available in 12 countries in Europe (i.e., France, UK, Germany, Switzerland, Netherlands, Denmark, Norway, Belgium, Spain, Italy, Poland, and Austria). Since 2016, more than 12 million users have downloaded the app, and it has had more than 26,000 producers/partners in those 12 countries. Thanks to the TGTG app, more than 17 million meals have been saved.

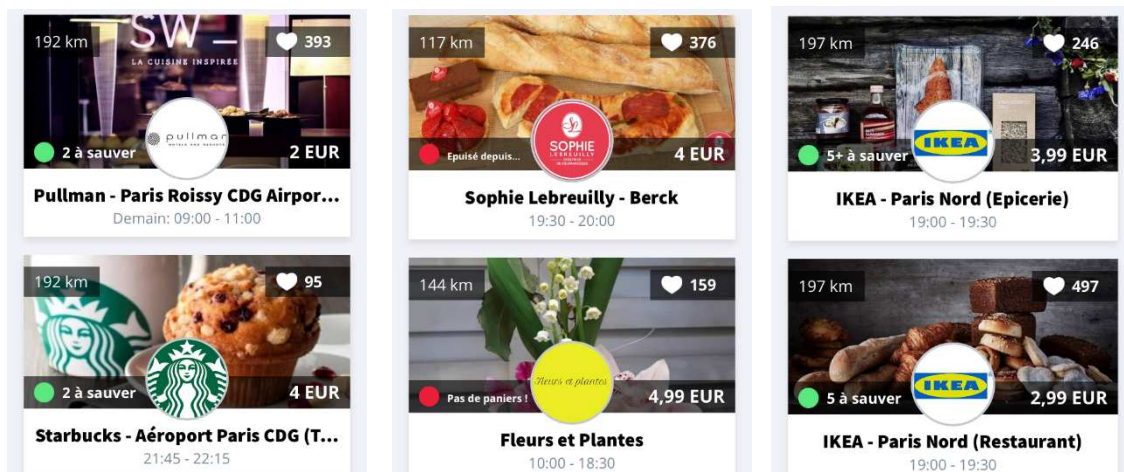


Fig. 2. Illustration of the TGTG App from the Customer Interface (Source: Photos Taken by the Authors on 28/11/2020).

The TGTG app is available on the App Store and Google Play. The app offers two interfaces: one for restaurateurs and one for customers. After creating an account, customers are able to see the “baskets” available for takeaway (in TGTG’s terminology, a “basket” means the unsold product to save close to the customer’s geographic location). For example, in Fig. 2, we used “Paris” as a location, and we captured several of the results. For Starbucks, a customer can save two baskets for €4, each with a coffee and a muffin. However, customers are not allowed to come at any time, especially not during busy business hours. Here, as we can see, customers can order one of the two baskets and come between 9:45 pm and 10:15 pm

to pick them up. When there are no baskets available, this is shown by a red circle (e.g., “Sophie Lebreuilly – Berck” in Fig. 2).

The app was launched to build a direct relationship between customers and producers, no matter the size of the business. As can be seen in Fig. 2, IKEA, Pullman, and Starbucks have adopted the app in addition to small businesses, such as the small flower shop “Fleurs et plantes”. Companies of all sizes are using the app to fight against waste.

3.3. Data Collection

We collected two types of data: secondary data (TGTG Press Kit, 2019) and primary data obtained from semi-structured interviews with the TGTG provider and restaurant managers and customers (i.e., users of the TGTG app). Given the difficulty of identifying restaurant managers and consumers who have used the app, we opted for the snowball sampling technique, which uses interpersonal relations and connections between interviewees. Snowball sampling is often used when the population under investigation is “hidden” due to, for example, either the low number of potential participants or the sensitive nature of the subject matter (Browne, 2005). For this research, snowball sampling was an effective method to recruit restaurant managers and customers, especially restaurant managers. In addition, to determine the size of the samples, we opted for the criterion of semantic saturation (e.g., following the semantic saturation criterion, 19 and 24 semi-structured interviews were conducted to gain insight into restaurateurs’ and customers’ VIU, respectively). Each interview lasted between 40 and 60 minutes.

Detailed information on the restaurant managers and customers interviewed is summarized in Tables 1 and 2. As requested, the names of restaurants were not revealed to ensure confidentiality. For restaurant managers, TGTG membership duration is from three months to over two years (Table 1). The frequency of use of the TGTG app by customers is on average one to three times per week (Table 2). To better understand CVP, we interviewed the TGTG provider and used the TGTG press kit published in July 2019. Following the conceptual framework (Fig. 1), the main questions for the TGTG provider were as follows: 1) What are the current functions of the TGTG app? 2) How are these functions expected to be used by users? 3) What are the types of value of the TGTG app for users? 4) How are these types of value delivered to users? 5) Why are these types of values important for users? For restaurant managers and customers, the focal questions were as follows: 1) What functions in the TGTG app have you used? 2) How have you used these functions? 3) What are the types of value

that you have gained from these functions? 4) How have you gained these types of value from using the app? 5) Why have these types of values been important for you?

Table 1

Profile of Restaurant Managers.

ID	Age	Sex	Location	Membership Duration (TGTG Membership) (in Months)
M1	34	M	Paris	3
M2	29	F	Paris	24
M3	45	M	Paris	More than 12
M4	52	M	Paris	Less than 12
M5	49	F	Paris	3
M6	53	F	Paris	Less than 12
M7	45	F	Paris	More than 12
M8	47	M	Paris	24
M9	42	M	Paris	18
M10	30	F	Paris	18
M11	38	F	Paris	8
M12	43	F	Paris	4
M13	54	M	Paris	More than 12
M14	39	M	Paris	8
M15	31	M	Paris	12
M16	48	F	Paris	More than 24
M17	53	F	Paris	More than 24
M18	55	F	Paris	More than 24
M19	46	M	Paris	More than 24

Table 2*Profile of Customers.*

Name	Age	Sex	Location	Frequency of Use of the TGTG App (Average Number of Uses per Week)
Raphaël	32	M	Paris	1
Pauline	23	F	Paris	1
Clémence	40	F	Paris	1
Véronique	27	F	Paris	2
Martin	22	M	Paris	2
Lou	20	M	Paris	2
Antoine	36	M	Paris	2
Murielle	33	F	Paris	1
Marie	34	F	Paris	1
Wolker	35	M	Paris	2
Marion	25	F	Paris	1
Isodora	34	F	Paris	1
Cécilia	21	F	Paris	3
Sami	33	M	Paris	2
Florence	29	F	Paris	3
Fabienne	27	F	Paris	2
Nicole	26	F	Paris	1
Annie	33	F	Paris	2
Tom	27	M	Paris	2
Jean	24	M	Paris	2
Hugo	27	M	Paris	2
Maxime	33	M	Paris	3
Henry	40	M	Paris	2
Patrick	45	M	Paris	2

3.4. Data Analysis

Based on the conceptual framework (Fig. 1), two coding dictionaries were developed. One was employed to analyze verbatim from the TGTG provider and the TGTG press kit, which covers such topics as the functions of the app, how these functions are expected to be used, what types of value the TGTG app is expected to offer to users, how these types of value are

expected to be delivered to users, and why these types of values are important for users. The other was employed to analyze verbatim from the restaurant managers and customers interviewed, which covers such topics as what functions are used, how these functions have been used, the types of value gained from using the app, and why these types of value have been important for the restaurant managers and customers.

A content analysis using the QSR NVivo 12 software was performed case by case and according to the category of respondents (the TGTG provider, restaurant managers, and customers). In addition, to ensure internal validity, following Vo-Thanh and Kirova (2018), two of the authors analyzed the first three interviews together according to the three categories of respondents. Afterward, each author analyzed the rest of the corpus separately, using the same developed dictionaries. The results obtained by the two authors were then compared using the QSR NVivo 12 software. To achieve this comparison, the function of the coding comparison query provided in QSR NVivo 12 was used, as indicated by Vo-Thanh and Kirova (2018). Divergences were discussed to reach a consensus. Moreover, the two authors cross-checked the results together to examine similarities and differences regarding the app's CVP and VIU among the three categories of respondents and to draw a single set of cross-category conclusions related to perceived values.

4. Findings

A comparison of the provider's service design and users' (i.e., restaurant managers and customers) experiences of the TGTG app reveals both similarities and differences between the three groups.

4.1. Functions and Affordances

TGTG offers several functions and two types of interface: one for restaurant managers and one for customers.

The interface for restaurant managers allows them to post information about their restaurant and baskets, modify the prices and receiving times, track the invoices, and more. There are other functions such as validating each guest order, cancelling the guest order when the restaurant has sold out of so-called "unsold" baskets, and contacting the TGTG team via a hotline or e-mail through the app if any problems arise. Lastly, every time a customer comes to pick up a basket, the restaurant must validate it on the app using the customer's smartphone.

In the interface for customers, one of the main functions is “discover,” which allows customers to visualize available baskets. Customers can have information on the name of the restaurant, the number of available baskets, the prices, the collection window, and the distance from their geographical location. In addition, the TGTG app allows customers to access their profile, payment details, and receipts of their previous purchases. Like restaurant managers, customers can access the TGTG blog or contact the TGTG team from the app in real time. Customers can geo-locate restaurant partners nearby, order a “surprise basket” made up of unsold meals from that day, pay a small price online, and be present at the indicated collecting times to pick up their baskets.

Users can download the app and easily open an account. The app is user-friendly. According to the TGTG provider, the objective was to create an app that is easy-to-use, practical, and time-efficient for all stakeholders. Moreover, as TGTG has initiated a campaign of awareness and education on food waste, users can also view various information on anti-food waste when using the app.

Giving advice and sharing best practices and the reality of food waste with users are founding goals of the TGTG app. (TGTG Press Kit, 2019, p. 7)

We would like to offer an app that is really user-friendly to facilitate the users' life. An app that is complicated to manipulate is not an app, because it goes against the *raison d'être* of an app. [...]

TGTG is a win-win model. (Provider)

Most restaurant managers acknowledge the usefulness and easy-to-use features of the functions offered by the app. The option to contact the TGTG team in real time is significant for restaurant managers.

The TGTG app is very easy to use. Features are less complicated in comparison with Uber Eats or Deliveroo. [...] We can also contact the TGTG team in real-time. (M18)

I use most of the main functions of the TGTG app such as posting information on baskets that need to be saved, modifying the prices and collecting times, writing captions for the restaurant, etc. (M3)

We mainly use the basic function of this TGTG app in order to put our baskets online and basket related information. Sometimes, I use the hotline to contact the TGTG team to solve any problem (payment, conflict with clients, etc.). (M1)

In general, the functions are quite easy to use, just download the app on a smartphone or tablet to be used immediately. [...] Generally, the experience is good. (M9)

I also consult the app to see my historic data in order to know on which date how many baskets were sold out... I also use this app to know if other restaurants in my sector are also present on the app and how many baskets they are selling. It gives me an idea of the overall business in my sector. I sometimes contact the TGTG customer support to resolve any problems (payment, conflict with customers, etc.). (M14)

On the other hand, customers mainly use the app for ordering baskets, while recognizing the practicality and user-friendliness of the app. Other features such as the blog and contact support are of minimal interest to most consumers.

I only use the basic functions for buying leftovers. The app is really easy to use. (Pauline)

I use this app to search for baskets available near to me and in real time. Sometimes, I look for a specific restaurant. In fact, I want to experience this restaurant, but it is very expensive. So, I check on the app if the restaurant is proposing something. I also do the same if I like a dish from a particular restaurant and I want to have it again. (Tom)

Overall, according to the technology affordance theory, this research evidences a congruence between the three groups, suggesting that the ways that users use the various functions offered by the TGTG app largely meet the provider's expectations. Furthermore, most of the features are well utilized by restaurant managers. For customers, some features such as the blog and contact support are underexplored. According to the TGTG provider, it is nonetheless essential to have these features to reassure customers. Most users recognize the usefulness and easy-to-use functions of the app and emphasize their positive experience using it, which explains why the TGTG app is so highly rated on the App Store and Google Play. This finding is in line with earlier studies claiming that user-friendly food apps are perceived favorably by businesses and customers (Apostolidis et al., 2021; Kapoor & Vij, 2018).

4.2. Value Proposition and Value-in-Use

In terms of value outcomes, they were classified based on the types of consumption values, as proposed by Sheth et al. (1991). These values are multidimensional and contain both cognitive and affective aspects (Holbrook, 2006; Sheth et al., 1991; Sweeney & Soutar, 2001). These perceived values guided us through exploring CVP and VIU. Regarding VIU, the results show that restaurant managers and customers share the same values (Fig. 3).

The first value that respondents, whether users or providers, highlighted was social value, stressing the role and vocation of the app in fighting against food waste. TGTG also helps users to participate in a community and, as such, gain a sense of citizenship and social responsibility. Interestingly, this result is not consistent with previous studies on food waste mobile apps, which indicate that philanthropic goals such as societal and environmental well-being are not overly emphasized by businesses (e.g., Apostolidis et al., 2021). This inconsistency could be due to the social nature of the TGTG app and particularly its popularity in Europe.

Our goal with the team is to become the leading player in fighting against food waste. At the end of the year, if you ask someone on the street about the issue of food waste, I would like TGTG to be mentioned as a reference. (Provider)

Collecting your “basket” on TGTG is the first step towards more responsible consumption and the impact that we can have. We must make people understand that by changing their daily habits, they contribute to solving global problems. (Provider)

Engaging with TGTG is just common sense. One third of the food produced on the planet goes to the trash! [...] The whole circuit has to change its functioning. (Thierry Marx, Chef of Mandarin Oriental, Paris) (TGTG Press Kit, 2019, p. 5)

TGTG is the first step in fighting against food waste. Beyond the app, it is also a true community of thousands of engaged storekeepers and hundreds of thousands of concerned citizens in 12 European countries. (TGTG Press Kit, 2019, p. 8)

Through minimizing food waste, TGTG helps reduce CO₂ emissions and contributes to serving the community by allowing everyone to get quality products at a reduced price that one may not be able to afford. So, from a social and economic perspective, everyone wins. (Patrick)

Then, it also has a social value as it is ecological and anti-waste. (Lou)

Using TGTG for ordering dishes allows me to not only access quality dishes at a low price [...]. I always feel proud of myself when using TGTG to order dishes. [...] My relatives and friends also think that TGTG is a good initiative to solve certain social problems, such as fighting against food waste, environmental protection, and equal access to quality products. (Hugo)

I think I contribute in a small way to helping people with modest income to access quality products by using TGTG to sell the leftovers. (M10)

The *functional value* is also highlighted by the three groups. TGTG allows customers to access quality food at an affordable price near where they are and also to access help online. For restaurant managers, TGTG is a commercial tool to increase their turnover. This result is consistent with previous studies suggesting that anti-food waste mobile apps allow businesses to supply surplus food to needy consumers and, at the same time, to generate additional revenue (e.g., Apostolidis et al., 2021; Schanes and Stagl, 2019). In addition, *nowness* service has emerged by dynamically engaging, in real time, users in the sale experience (for restaurant managers) and the consumption experience (for customers).

First of all, our app helps customers [...] have the leftovers for a very low price where they are and provides them with online support in real time. (Provider)

First, I can have a basket for less than 4 euros. So, it is very economical. So, I can have excellent value for money. [...] However, I would prefer to access information on the recipes in order to avoid throwing food because of allergies, for example, which would go against the main objective of TGTG. (Marie)

First of all, it helps me to increase our turnover. Although each basket does not bring more than 4 euros, and we need to pay commission and we have other costs, it is better to earn a little money than giving the leftovers to the associations or just throwing them. (M6)

The functions are designed to be simple, easy to manipulate, and easy to edit. We also have online support in real time. TGTG keeps me from throwing unsold food and helps me to earn a little more. So, the functional value of this app is undeniable. (M9)

However, some differences in value perceptions exist between users and the TGTG provider. Users highlight that using the TGTG app gives them emotional value, while the TGTG provider places more emphasis on epistemic value.

For users, they believe they are helping to save the planet by using the TGTG app.

Then, by using this app, I also feel that I have done something positive for the planet. (M13)

TGTG is simply an application that we should use for both the planet and individuals' well-being. (M19)

I feel like I have done something positive for the planet. (Florence)

Using TGTG for ordering dishes allows me to [...] contribute in a very small way to protecting the planet from environmental harm. (Hugo)

For the TGTG provider, beyond its functional and social values, the app also arouses curiosity in its users and helps them to have an innovative experience, satisfying their search for novelty, knowledge, and meaning in everyday life. Specifically, TGTG aims to inspire and empower users to make better choices related to food consumption.

TGTG also has the goals of giving access to healthy food to as many people as possible and providing people with information on how to eat well. We need to find an economic model that allows for this. [...] People are looking for meaning, and with digital, in particular, we can allow everyone to find it out and live an innovative experience. (Provider)

As for how the various values are important for respondents, from users' perspectives, the app helps to establish a link between restaurant managers and customers. By using the app, customers can communicate with restaurant managers every time they come to collect the food and can view the availability of baskets and buy them at a low price. As for restaurant managers, thanks to the app, they can increase their turnover by not throwing away leftovers. Moreover, for both restaurant managers and customers, using the app equates to doing something positive for the planet. Key phrases such as "anti-food waste," "get good food," "X meals to save," and "every second, 51 tons of food are wasted" make users more aware of the need to protect the environment and to achieve responsible and sustainable development. All these values are really important for users for various reasons.

As a restaurant owner, it is very important for me to maximize my turnover and do my business in a positive way when we have that possibility. [...] Today, we need to think about the planet, and I think these values should be shared by everyone. (M5)

For me, functional value is really important; an app should be simple for users, especially in a working environment like a restaurant where everything needs to be resolved quickly and effectively. (M11)

First, it is economical, and we have excellent value for money. [...] Today, there is a need to fight against food waste and to be more environmentally friendly. So, I can participate in this. (Martin)

From the TGTG provider's perspective, the social, functional, and epistemic values that TGTG offers to users are important for them because they enable them to take action against food waste. The TGTG can also be an excellent tool for restaurant managers to increase their turnover and for customers to easily access quality food at an affordable price. In addition, TGTG can help users to satisfy their search for meaning, which is nowadays often related to social and environmental concerns.

We are convinced that users (restaurant managers and customers) would participate in fighting against food waste, and we give them the opportunity to do so. Users are more and more conscious of their social and environmental responsibilities. Furthermore, direct exchanges between them are much easier thanks to the smart devices they have. (Provider)

5. Discussion and Conclusion

This research investigated how an app can be a catalyst for sustainable SB by examining both the perspectives of providers and users, using the TGTG app as a case study. This study is significant insofar as food redistribution and sharing mobile apps are becoming increasingly popular, while little academic research has examined the values that these apps can bring to the fight against food waste (Apostolidis et al., 2021; Davies et al., 2017; Harvey et al., 2019). This study contributes to the literature on social entrepreneurship in general and on how a mobile app can become a catalyst for sustainable SB in particular. By delineating the underlying reasoning behind the TGTG provider's service design and users' experiences of the app, this study's findings helped us to understand the mechanisms behind how an app like TGTG can contribute to sustainable SB. In doing so, this study answers Guyader's (2018) call for greater understanding of what service providers and users do when they engage in SB. In addition, the results of this research complement those of prior mobile app studies, which primarily studied the phenomenon quantitatively (Lei et al., 2019).

Drawing on the technology affordance theory and S-D logic, in line with Apostolidis et al. (2021), this research shows that capturing similarities and differences in various stakeholders' perceptions of app functions and values is important for developing apps that enable sustainable value co-creation. Accordingly, a thorough examination of the factors driving apps' values (CPV and VIU) is vital.

Overall, in the findings, there are significant similarities in terms of technology affordances (Fig. 3). In other words, the ways that users use the various functions offered by the TGTG app meet the provider's expectations. Regarding both CVP and VIU, the findings also

indicate congruence in terms of social and functional values. Nevertheless, a slight difference was detected: using the TGTG app offers emotional value to users, while the TGTG provider seeks to emphasize the epistemic value that TGTG can provide users (Fig. 3). All these results suggest that users mostly share the main objective of the TGTG provider, that is, to reduce food waste. Indeed, epistemic value, as outlined by the TGTG provider, could lead to emotional value in users, as it arouses curiosity in them, which empowers them to live an innovative experience and make better choices in relation to food consumption. Through this, they may live a more meaningful life and feel useful by doing something positive in their everyday life.

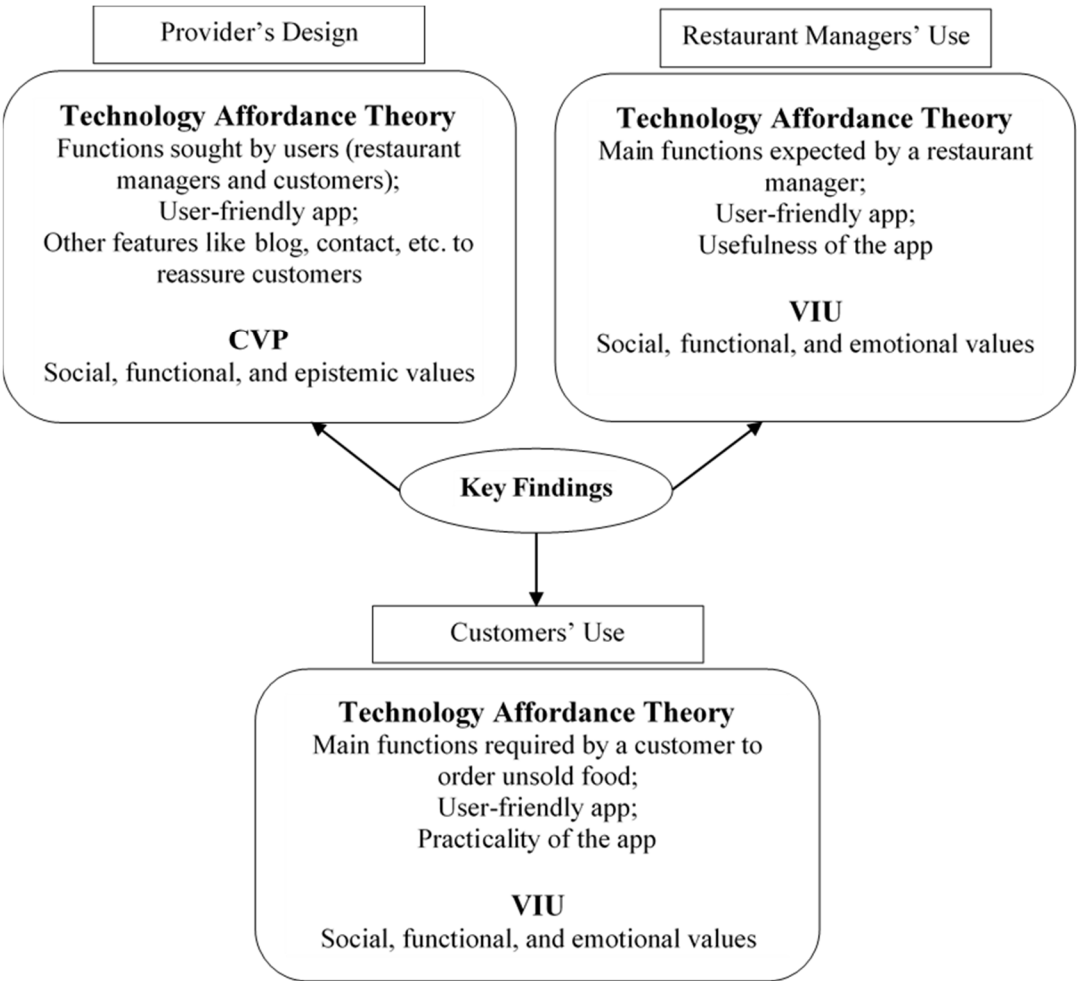


Fig. 3. Key Findings.

In the findings, several factors explain how TGTG can contribute to sustainable SB; to achieve sustainable development, the impact of technology on both SBs' commercial operations and their social and environmental missions must be understood. First, the social value embodied in the raison d'être of TGTG has been widely highlighted in different ways.

Specifically, key phrases such as “anti-food waste,” “get good food,” “X meals to save,” and “every second, 51 tons of food are wasted” can be found everywhere, for example, by the side of the TGTG app icon on the App Store and Google Play, in in-app information, and in the press kit. For the TGTG provider, it is strategically important to deliver a strong message on a social cause, helping users to become more aware of the need to save unsold food. Thus, the TGTG’s main objective of minimizing food waste is shared by all stakeholders (i.e., the provider, restaurant managers, and customers).

Second, this study indicates that users greatly appreciate the functional value of TGTG, such as nowness service, ease-of-use, and anytime orders. This finding is consistent with previous research on hotel mobile apps (Lei et al., 2019; Wang et al., 2016). Specifically, for a food mobile app like TGTG, nowness service (i.e., hotline) is a function that users really enjoy, which confirms earlier studies’ findings that nowness service offers dynamic engagement with connected users (Buhalis and Sinarta, 2019).

Third, TGTG allows users to find their accounts from both economic and emotional perspectives. This study shows that both restaurant managers and customers are generally satisfied with using the app, especially in terms of economic value. Innovations in ICT significantly diminish transaction costs but require the transparency of all stakeholders involved (Shams and Solima, 2019). In addition, users have a positive experience when using the app, as they believe that they are doing something good for the planet. These values indisputably encourage them to actively contribute to reducing food waste. Given the success of the TGTG business model, the provider has been expanding its partners by working not only with restaurant owners but also with supermarkets, producers, and others, with the ultimate goal of reducing waste in general and food waste in particular.

Fourth, during the COVID-19 pandemic, the hospitality industry (e.g., hotels and catering) has been among the most affected due to adopted measures (e.g., social distancing, travel restrictions, and stay-at-home orders) (Vo-Thanh et al., 2021a, 2021b; Zhao and Bacao, 2020). The way that restaurant managers deliver unsold food using the TGTG app effectively maintains social distancing, reduces the spatio-temporal interval between sale and consumption, and enriching the service range. Using the TGTG app has also enabled food businesses to generate additional revenue, increase exposure to new customers, be more environmentally friendly, and strengthen their brand image, which all help them to better survive this global crisis.

Fifth, millennials will one day become the older generation. Multiple studies (e.g., Hasan et al., 2021b; Paulo et al., 2018) have underlined that habitual behavior plays a vital role in

technology adoption and intention to use new technologies (e.g., mobile apps). According to Suthar (2020), nearly 1.4 billion people use messaging apps such as Facebook Messenger and WhatsApp, which is a habit that facilitates the adoption of other mobile apps, such as TGTG. In the near future, it can be expected that both younger and older generations will use mobile apps and other technologies out of habit.

5.1. Theoretical Implications

First, this research complements the literature on mobile apps that largely only focuses on either pre-adoption or post-usage evaluation (Lei et al., 2019); it has done this by exploring both design and use processes and by identifying the reasons that lead to outcomes. Thus, this study is exceptional in its use of a different theoretical posture (CVP vs. VIU) to examine how a mobile app can contribute to obtaining a given goal. Specifically, this research aims to explain how TGTG can be a catalyst for sustainable social business by comparing the perspective of designers with those of users. Researchers have underscored that success in designing affordances into a tool is based on understanding the use context (Kirova and Vo-Thanh, 2019; Lewis et al., 2003), which is why, theoretically, the technology affordance theory and S-D logic are highly relevant in investigating this research objective.

Second, the findings provide a conceptual base for the examination of inter-relationships through perceived values from various stakeholders. To improve the efficiency of ICT's contribution to SBs' sustainability, one should investigate various points of view (i.e., CVP and VIU) and ensure some compatibility in terms of the main missions and objectives of stakeholders. Since social behaviors can result in both tangible (e.g., innovative products) and intangible outcomes (e.g., sense of belonging and well-being) (Liu et al., 2016), they should be understood and shared by all stakeholders. Indeed, TGTG can only fulfill its potential in reducing food waste when users find themselves to benefit from using the app (e.g., access good food at an affordable price, receive help in real time, participate in a community for fighting against food waste, and do something positive in everyday life). Therefore, the findings offer support to the reciprocity concept in terms of the literature on fighting against food waste. Admittedly, the reciprocity concept has been valued to examine the underlying motivations for the sharing economy (Guyader, 2018; Kumar et al., 2018) and sustainable tourism development (Vo-Thanh et al., 2020). Thus, in achieving a given goal (e.g., a social mission), the contribution of a digital solution like a mobile app can be fully explored through a reciprocity lens.

5.2. Practical Implications

First, this research found that emotional value is important among users of the TGTG app, even though this particular value has not yet received attention from its provider. Therefore, providers of mobile apps with a social mission like TGTG should focus on this type of value while designing various features of their app.

Second, the majority of users wish to be able to access information (e.g., for allergies) on the recipes to avoid having to throw away the food purchased on TGTG, which is counter to TGTG's mission. S-D logic highlights the importance of the effective exchange of ideas and the provision of sufficient means to users to facilitate their value creation process (Vargo and Lusch, 2008); in line with this, it would be strategic to incorporate this information into both restaurant managers' and customers' interfaces.

Third, since users may not necessarily perceive the value of mobile apps even after they have adopted the technology (Lei et al., 2019), understanding the context of app usage and integrating such contextual factors into the app design is important for maximizing VIU. This is consistent with previous studies' emphasis on considering context when examining users' experiences of technologies (Kirova and Vo-Thanh, 2019).

Fourth, given TGTG's success, other businesses such as supermarkets and schools should follow its example to perform their social and environmental mission on the one hand and to optimize their income on the other. For example, supermarkets could create a section on their apps dedicated to products whose preferred consumption date is approaching, and they could sell these products at a reduced price. If permitted by regulations, schools should daily communicate via their website or an app about leftovers and should donate them to certified local associations (e.g., Food Bank).

Fifth, according to Statista (2019), most mobile app users in France are 55 years old or younger. Moreover, 80.6% of French customers aged between 50 and 64 buy online, and 72% of those aged over 64 shop online (Fevad, 2020). Although the older generation does not use mobile apps in the same way as the younger generation, they are nonetheless highly present on the Internet and online retail. Therefore, the TGTG app should also create a website to capture the older generation.

6. Limitations and Future Research

This study adopted a qualitative research approach, which means that the results have limited generalizability. However, the aim of this research was to address a research gap and to comprehend how digital solutions, especially a mobile app, can be an effective tool for

sustainable SB. Therefore, this limitation does not weaken the study's theoretical and practical contributions.

This study only focused on the French market, and the findings may vary between different countries. Hence, future studies should take into consideration quantitative data or should be conducted in different cultural contexts (i.e., in other countries where this app is in use) in order to offer more insights into the phenomenon. Moreover, comparisons across different cultures are highly encouraged.

In this study, we identified social, functional, and emotional values as the success factors for the TGTG app to accomplish its social mission of reducing food waste and CO₂ emissions, allowing everyone to access quality food at an affordable price, catalyzing social change, and addressing social needs. Future research should be conducted to examine other apps for various social causes to apprehend other potential success factors, which would enrich this study's findings.

As a social movement, TGTG is becoming more and more popular with other businesses such as bakeries and supermarkets. Future research should focus on these businesses to better understand the wider role of TGTG as a catalyst for sustainable social business.

In this research, we focused on the TGTG app, which is a successful SB. Unsuccessful social apps should also be explored, as this would offer useful insights into the contribution of ICT to SBs' sustainability.

Finally, as human behavior – especially related to sustainable and social concerns – changes over time, future studies should employ longitudinal study designs to gain greater insight into the ability of TGTG to combine resources to address social needs.

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