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Mobile channel as a strategic distribution channel in times of crisis: a self-determination theory perspective

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ABSTRACT

The Covid-19 pandemic has profoundly disrupted the worldwide economy, particularly the restaurant sector. To face these challenges, the multi- and omni-channel approaches have been embraced by several firms, especially with the integration of mobile channels and social media. However, no research is conducted to investigate how this integration can be successful in times of crisis, such as pandemic. Therefore, drawing upon the self-determination theory, the present study aims at addressing this research gap by exploring, from both the restaurant owners' and customers' perspectives, how an anti-food waste mobile app called Too Good To Go (TGTG) – the largest social case in Europe, is perceived as a strategic distribution channel in the time of pandemic. Based on 18 in-depth interviews with restaurant owners and 22 with customers in Paris, findings highlight the success factors for restaurants to achieve their digital strategies. Theoretical and practical implications, and future research perspectives are presented.

1. Introduction

The novel corona virus is considered as the deadliest virus in the recent history (Vo-Thanh et al., 2021). In order to stop the spread of virus, the most common actions implemented by the countries included closing borders, declaring lockdown, closing non-essential commerce, restriction on public and private gatherings, privilege the remote work, etc. These measures have highly impacted the world economy.

All the small business such as shopping outlets, hotels, restaurants, cafes, hair salons, etc. which were in face to face contact with the customers were forced to shut down to ensure the social distancing (Sharma et al., 2020). Among the retails, the restaurants are one of the sectors highly impacted by the pandemic and government's measures. These measures put restaurants into new challenges. As the situation was worsening in late October 2020, like other retails, restaurants were only allowed to propose the takeaway services. Hence, the turnover generated from the restaurant sector was radically declined in 2020 (Ouest-France, 2021). Before the Covid-19 pandemic, the restaurant sector represented 57 billion euros of annual

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turnover in France, but in 2020, it was only 35.6 billion euros (decreased by 38% vis-à-vis the previous year). Moreover, the number of restaurant customers was reduced by 35% in 2020 due to the Covid-19 pandemic (Ouest-France, 2021). In this regard, the alternative distribution channels have become highly important for restaurants. In addition, foods are perishable and cannot be stored as normal products/goods. By considering this apocalypse, restaurants and others food sellers, such as hotels, supermarkets, bakeries, etc. should maximize their distribution channels during the pandemic to reduce the food waste and maximize the revenue.

The development of ICT has changed the customers' behavior and their way of purchase (Janakiraman et al., 2018). Moreover, the use of smartphones has allowed customers to be ubiquitous or omni-present (Kirova & Vo-Thanh, 2019). Therefore, during the pandemic, the 'click & collect' has become very popular.

Regarding the restaurants, most of them are still using traditional distribution channel and taking reservations by phone (Kimes, 2011). With the development of ICT, multiple home delivery, food sharing, and redistribution websites and apps have appeared (Apostolidis et al., 2021; Harvey et al., 2020). In this context, the question on the success of strategic omni-channel management arises, as omni-channel does apply to the points of sales and the retail sector (Verhoef et al., 2015). Omni-channel management is about the integration of several channels by a firm, generating multiple customer touch-points, which leads to customer satisfaction via a service experience without interruption (Barwitz & Maas, 2018). Most of previous studies have explored the use of ICT as a food-sharing tool (e.g. Harvey et al., 2020). However, little is known about exploring ICT as a strategic tool of food recovery (Apostolidis et al., 2021). Moreover, there is a research gap on how mobile technologies such as smartphones, apps, tablets can help businesses survive the COVID 19 pandemic. By considering these gaps, this paper aims to explore the following research question:

How is an anti-waste mobile app perceived as a strategic distribution channel in the time of pandemic?

This study examines the case of an anti-food waste mobile app called Too Good To Go (TGTG). Launched in 2016, today it is considered as the largest anti-food waste movement in Europe with 30 million daily users. Due to the popularity of this app, it is crucial to explore how an anti-food waste mobile app can be efficient during the pandemic and used as a strategic distribution channel of food by satisfying the two groups (restaurant owners and customers).

The contributions of this research are both theoretical and practical. Theoretically, this study is one of the rare ones using a different theoretical posture to examine how a mobile app can contribute to obtaining a given goal. This research suggests that the self-determination theory is very relevant to deal with such research objective. Practically, it provides various recommendations to improve the effectiveness of businesses' digital strategies, which are integrated into their global multi (omni)-channel approach.

2. Theoretical background

2.1. Multi-channel and omni-channel as strategic approaches?

The ICT has allowed firms to opt for multi- and omni-channel approaches. Service businesses are today interacting with clients through a variety of channels (Akter et al., 2020). These channels are often considered as the touch-points enabling customers to have direct or indirect interactions with a firm (Verhoef et al., 2015). The multi-channel strategy mainly involves the decision whether a firm needs to add any additional channel to its existing ones (e.g. Verhoef et al., 2015). Generally, operating additional channels might result in increasing customers' purchases (Hossain et al., 2019, 2020). However, managing the customers across channels and delivering a consistent and reliable customer experience are challenging for the firm (Cui et al., 2021; Verhoef et al., 2015). To address this challenge, the omni-channel retailing model was developed, especially with the integration of mobile channels and social media (Saghiri et al., 2017). The omni-channel customer experience is described as 'the synergetic management of the numerous available channels and customer touch-points, in such a way that the customer experience across channels and the performance over channels is optimized' (Verhoef et al., 2015, p. 176). The interaction can operate across different physical and virtual retail channels, including stores, direct marketing, websites, mobile channels (i.e. smartphones, tablets, apps), social media, or other customer touch-points, such as mass communication through radio and television (Saghiri et al., 2017). Therefore, the omni-channel system ensures maximum information availability and added value for customers. For the retails, it helps them enhancing visibility and consistency across the multiple channels, optimize sales and costs, and synergy (Saghiri et al., 2017).

For example, the tourism and hospitality industry is highly competitive with the arrival of new players, such as online travel agencies (OTAs) and review websites (Zaman et al., 2016). Tourism and hospitality firms are struggling to sell their rooms by using the right channel. Therefore, the theory of revenue management has been introduced in order to sell the products (e.g. hotel room, airline ticket) to the right persons at the right time by using the right channel. Despite many advantages (i.e. increased visibility and sales), OTAs take a significant percentage of commissions (up to 25% for Expedia) (Zaman et al., 2016) and it is more profitable for a hotel to sell their rooms via a direct channel. Concerning the restaurants, the development of mobile apps has brought new third-party actors: home delivery service providers. These third-party providers take away between 25% to 30% commissions from the restaurants (Resto Connection, 2019). During the pandemic, restaurants should use additional apps, such as TGTG as their additional distribution channel to optimize their revenue. Therefore, the various motives of TGTG' users should be studied to better understand the importance of this channel.

2.2. Self-determination theory

Motivation is a fascinating concept in the marketing field (Palmatier et al., 2006). To address consumers' motivations, marketing scholars have embraced several consumer behavior theories. According to Gilal et al. (2019), the consumer decision model (Engel et al., 1968) and the theory of buyer behavior (Howard & Sheth, 1969) are founding theories in research on consumer behavior, pursued by the theory of reasoned action

(Fishbein & Ajzen, 1975) and the theory of planned behavior (Ajzen, 1985). As for them, the theory of trying (Bagozzi & Warshaw, 1990) and the model of goal-directed behaviors (Perugini & Bagozzi, 2001) attracted, in the late 1990s and early 2000s, the attention of consumer behavior researchers. These theories principally focus on extrinsic motivations, leaving a gap in predicting intention development in view of intrinsic motivations (Gilal et al., 2019). The self-determination theory (SDT) claims that people possess intrinsic motivations, e.g. curiosity-based behaviors, discovering new perspectives, and seeking out of optimal challenges (Gilal et al., 2018). Therefore, SDT is a more promising approach to capture different, i.e. intrinsic and extrinsic, motives when predicting behavior (Gilal et al., 2019).

SDT refers to the importance of social contexts and the motivation of humans for personal growth. Its central principle is that all individuals have intrinsic tendencies toward psychological development. Individuals perceiving their behaviors as intrinsically motivated feel a sense of choice and volition, whereas individuals perceiving their behaviors as extrinsically motivated experience feelings of pressure (Shin & Dai, 2020). Deci and Ryan (2000) showed that intrinsic motivation gives rise to more positive consequences than extrinsic motivation. Therefore, increasing individuals' experiences by enhancing their sense of autonomy and control rather than by using coercion enables more positive emotions, performance, behavior change, and wellbeing (Deci & Ryan, 2000; Shin & Dai, 2020). However, earlier research on consumer behavior has essentially focused on extrinsic motives, such as excellent price and packaging, while intrinsic motives, such as fulfillment of autonomy, competence, relatedness have been overlooked (Gilal et al., 2020). These intrinsic motives of consumers can only be grasped by the SDT (Gilal et al., 2019).

Previous studies on self-service technologies' (SST) adoption have frequently used the technology acceptance model (TAM) (e.g. Lien et al., 2021), the unified theory of acceptance and use of technology (e.g. Jeon et al., 2020), or the theory of planned behavior (e.g. Lien et al., 2021; Yang, 2012). These theories, however, do not consider customers as co-creators of the value or active collaborators, but as passive ones driven by features of technology (Shin & Dai, 2020). Moreover, the traditional technology adoption framework (i.e. TAM) provides little explanation of actual use, use patterns, and the diverse user values of technology (Kirova & Vo-Thanh, 2019). According to Kirova and Vo-Thanh (2019), research on technology use patterns, nonuse, and most notably, actual use has been under-investigated. More recently, Ray et al. (2019) mobilized the uses and gratifications theory to explain why people use food delivery apps. Chen et al. (2020) drew on the theory of planned behavior and utilitarian and hedonic values to examine customers attitudes as well as purchasing intentions regarding food delivery platform services. Based on affordance and means-end theories and service-dominant logic, Apostolidis et al. (2021) investigated how food waste mobile apps could boost sustainable value co-creation at the Bottom of the Pyramid market. Limited attempts have, thus far, been made to use SDT recognizing universal human needs, such as autonomy, rather than tangible and intangible rewards, in explaining customers' adoption of the SST (Shin & Dai, 2020). Furthermore, as underlined by Shin and Dai (2020), the context in which SST adoption is analyzed from the SDT viewpoint includes supermarkets (e.g. Leung, 2019) and hotels (e.g. Oh et al., 2013), with self-service kiosks as the technology form (e.g.

Oh et al., 2013). To date, no research using SDT has been conducted to examine how an anti-waste mobile app is perceived as a strategic distribution channel in the time of pandemic. Therefore, using SDT as a theoretical foundation, this study expands the multi- and omni-channel research by exploring the intrinsic and extrinsic motives of both restaurant owners and customers who use TGTG app.

3. Methodology

3.1. Research design

To capture human needs and motivations using SDT as the theoretical lens, it seems very relevant to opt for an exploratory, qualitative research paradigm originating from an interpretivist approach (Creswell & Poth, 2018) given the multifaceted and subjective nature of the research topic. Exploring restaurant owners' and customers' reasoning behind the TGTG app' adoption during the Covid-19 pandemic requires research approaches helping 'obtain deep insights through eliciting human interpretations of their perceptions and behaviors' (Lei et al., 2019, p. 3). In addition, due to the shortage of research on a profound understanding of adopting the TGTG app as an additional mobile distribution channel and as an innovative purchase channel from restaurant owners' and customers' standpoints respectively, a qualitative approach is widely justified.

Moreover, we chose the case study approach because it is the most appropriate to answer our 'what', 'why', and 'how' questions. Yin (2014) highlights that the case study strategy should be mobilized when such questions are being raised regarding a contemporary set of events on which the investigator possesses no or limited information. As the main objective of this research is to deeply look at the motivations and behaviors combining both the perspectives of restaurant owners and customers, the case study strategy appears to be particularly suitable. A single case study design was purposefully opted for by choosing the TGTG app, because this app for social purpose is an appropriate app for dealing with the research question on how an anti-food waste mobile app is seen as a strategic distribution channel in the time of pandemic. Furthermore, the purposeful sampling is often used in case study research, usually requiring a very small sample, and this form of sampling is suitable to select cases that are particularly informative (Saunders et al., 2009).

Based on the research question and the SDT, to capture a complete appreciation of why TGTG app was adopted, we explored both the perspectives of restaurant owners and customers. The informants' interpretations of TGTG app functions and motivations for using this app, especially during the Covid-19 pandemic were carefully investigated. The research design was to get in-depth reasons of using TGTG app behind the cognitive thinking of both restaurant owners and customers.

3.2. TGTG app's presentation

Launched in June 2016 in France, the objective of TGTG app is to make a link between customers and producers so that customers can access to quality food with a reasonable
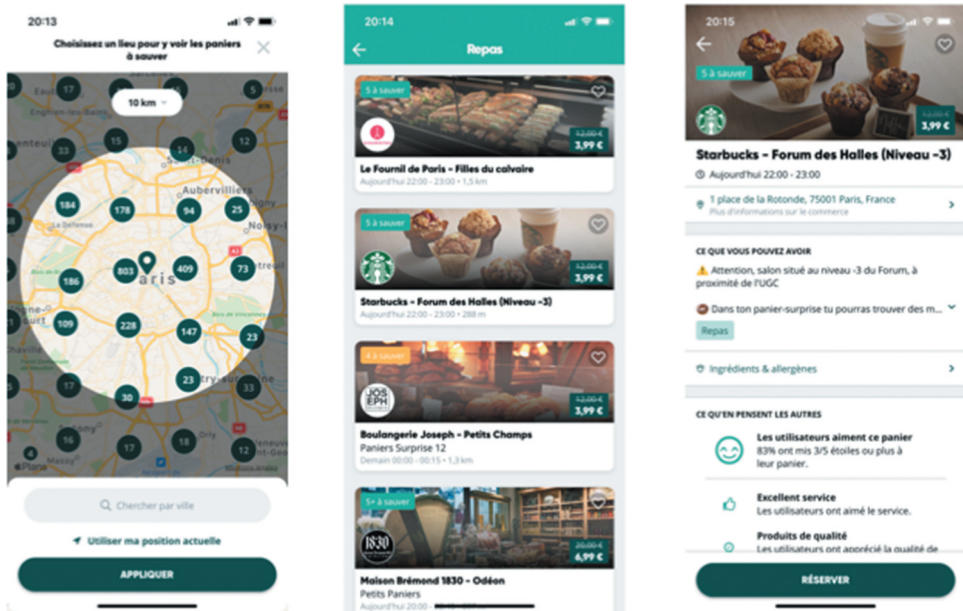
Figure 1. Illustration of the TGTG app from the customer interface.

price and producers can sell their leftovers rather throwing them. This app was to allow each person to engage against the food waste on his/her scale.

Figure 1 illustrates the user interface for customers. When a customer connects, he or she can see the baskets available by setting the distance from his/her actual location (on the left of Figure 1). On the middle of Figure 1, we can see the baskets available and their price. On the right side of Figure 1, Starbucks proposes 5 baskets for 3.99 euros but customers can pick them up from 10pm to 11pm.

3.3. Data collection

Data were gained from semi-structured interviews with French restaurant owners and customers living in Paris. Given the difficulty of identifying restaurant owners and consumers who have been using TGTG app, a purposeful snowball sampling technique was embraced to explore the research question. To determine the samples' size, we followed the semantic saturation criterion. Eighteen and twenty-two semi-structured interviews were carried out in French by one of the researchers to ensure the consistency. All the interviews were conducted in July and in August 2020, during the period between the two nationwide Covid-19 lockdowns in France (i.e. between 11 May 2020 and 29 October 2020). The interview protocol was composed of three key stages: warm-up, development, and closing.

Following the research objective, some key questions for the restaurant owners included *'What are the current functions of the TGTG app?', 'How are these functions used?', 'Why do you adopt the TGTG app as an additional distribution channel?', 'How can the TGTG app help you to face the difficult situation caused by Covid-19'?*. For the customers,

some focal questions were *'What functions in the TGTG app do you use?', 'How do you use these functions?', 'On average, how many baskets do you save per week?', 'What are the various motivations leading you to adopt the TGTG app?', 'How are these motivations satisfied from using the TGTG app?', 'What is the role TGTG app may play during the Covid-19 pandemic from a customer point of view?'*

Each interview lasted 25 to 40 minutes. The interviews' corpus was translated from French into English, using the back-translation strategy. Detailed information on the restaurant owners and customers is summarized in Tables 1 and 2. The names of restaurants were not revealed to keep the confidentiality. For restaurant owners, the TGTG membership duration is from 6 to 41 months (Table 1). The frequency of TGTG app use by customers is on average 4 times per week (Table 2).

3.4. Data analysis

Two coding dictionaries were created. One was used to analyze *verbatim* from the restaurant owners. The other was employed to analyze *verbatim* from the customers. A content analysis using QSR NVivo 12 software was performed by three of the researchers. To ensure internal validity, following Vo-Thanh and Kirova (2018), three of the researchers together analyzed the first three interviews with restaurant managers and the first three interviews with customers. To guarantee the results' reliability and validity, each researcher analyzed the remaining corpus separately, which strictly followed the multiple encoding procedure (Vo-Thanh et al., 2021). The results were then compared through QSR NVivo 12 software. To achieve this comparison, the function of 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, three of the researchers together cross-checked the results to examine similarities and differences among the two categories of interviewee, and to draw a single set of cross-category conclusions related to intrinsic and extrinsic motivations (Table 3).

Table 1. Profile of restaurant owners.

ID	Age	Sex	TGTG membership duration (months)
RO1	35	F	6
RO2	30	F	24
RO3	44	M	17
RO4	51	M	15
RO5	48	F	6
RO6	54	F	9
RO7	46	F	19
RO8	46	M	24
RO9	43	M	15
RO10	31	F	18
RO11	39	M	8
RO12	44	F	6
RO13	55	M	15
RO14	40	M	8
RO15	32	F	12
RO16	49	F	41
RO17	52	F	32
RO18	54	M	39

Table 2. Profile of customers.

ID	Age	Sex	Frequency of the TGTG app use (average number of uses per week)
C1	33	M	3
C2	25	M	4
C3	41	F	5
C4	28	F	3
C5	24	M	4
C6	22	F	5
C7	37	M	4
C8	33	F	3
C9	35	F	3
C10	35	M	4
C11	26	F	5
C12	33	M	5
C13	22	F	5
C14	34	M	4
C15	28	F	5
C16	29	F	4
C17	27	F	3
C18	32	F	3
C19	26	M	3
C20	32	M	4
C21	41	F	4
C22	46	M	5

Table 3. Intrinsic and extrinsic motivations of the TGTG app's adoption.

Intrinsic and extrinsic motivations	Restaurant owners	Customers
Control and autonomy motivation	Not available	Available
Health motivation	Available	Available
Functional motivation	Available	Available
Social motivation	Available	Available
Economic motivation	Available	Available

4. Findings

A comparison between the customers' and the restaurant owners' motives regarding the TGTG app's adoption during the Covid-19 pandemic was operated. *Verbatim* allowed to identify five main types of motivation leading interviewees to adopting TGTG app: control and autonomy, health, functional, social, and economic motivations.

4.1. Control and autonomy motivation

The first type of motivation is about control and autonomy. However, this type of motivation was not mentioned by the restaurant owners. Most of customers found that using TGTG app allows them to better control their food consumption and to have some autonomy in choosing the types of dish they want.

> [. . .]. I can really control the settings in order to find the baskets available near me. This app gives me the real-time information on the leftover. [. . .]. (C2)

> With this app, I can have a wide choice of dishes I want. I feel very autonomous in my choices; I am out of sight of others. [. . .]. (C11)

4.2. Health motivation

Health motivation is one of the most important concerns in the time of pandemic. For the restaurant owners, TGTG helped them to maximize the sales by respecting the health concern.

> After the lockdown, the government imposed many restrictions for the restaurants. The takeaway became very popular. The TGTG allowed us propose baskets at different times of the day in order to ease the crowd, which contributes to preventing the spread of Covid-19 [. . .]. (RO7)

Regarding the customers, the results underlined two main concerns: (1) most of customers ordered the leftover with TGTG because they wanted to avoid the contact with others and (2) at the same time they would like to have balanced food during the lockdown.

> I used to order via TGTG app because I could pick-up the leftover at a specific time when there were less people outside and I had less chance to get the virus [. . .]. (C9)
>
> [. . .]. I did not use home-delivery services such as Uber Eats or Deliveroo because the delivery guy used to go from one home to another. I did not feel very safe as the virus was highly contagious [. . .] (C22)
>
> During the lockdown, I really felt bad [. . .]. By using TGTG, I was able to find balanced food near to me and there was no need for cooking [. . .] (C7)

4.3. Functional motivation

The functionality of TGTG app motivates both groups. Restaurant owners can easily use different functions. TGTG app allows them to communicate easily with their customers, choose the number of baskets they want to make available each day, and modify the pick-up hours and price.

> [. . .]. Although I have very little IT knowledge, I can easily use the TGTG app. Features are less complicated than other home-delivery apps such as Uber Eats, Just Eats, Deliveroo, etc. I really work in autonomy [. . .]. In case of problem regarding the payment or other technical issues, I can easily join the TGTG hotline [. . .]. (RO10)

For customers, the functionality of TGTG is perceived very user-friendly.

> I usually use TGTG to search for leftovers nearby and get some information on baskets. [. . .]. The app is very easy to use and I can book a basket within few seconds [. . .]. (C12)

4.4. Social motivation

Both restaurant managers and customers want to contribute to the society. The TGTG app not only helps them reduce food-waste, but also the CO_2 emission. Additionally, during the pandemic, there was a huge solidarity between the small retails and the population.

[...], during the pandemic I put more baskets available for a very little price for the modest people living near to my restaurant. I believe that helps people have quality food during this difficult time [...]. (RO17)

[...]. I believe I contribute to helping people with modest income access quality products through using TGTG to sell the leftovers. (RO9)

Customers were using more and more TGTG app in order to help restaurants survive during the pandemic.

I use this app for more than 3 years and I really feel that I am doing something good for the society by reducing the waste. During the pandemic, the restaurants are heavily impacted and I use this app very often to help them [...]. (C15)

I feel very proud when I think that my little action can reduce the CO_2 emission and save the planet [...]. (C10)

[...]. I used to work in a restaurant and I understand the challenges that they are facing during this pandemic [...]. I do not have the ability to take away foods all the time as they are expensive but with this app, I am able to help local restaurants with a little budget [...]. (C4)

[...]. I feel very proud by using this app and I think the TGTG app somehow helps me to do my social duty [...] (C6)

4.5. Economic motivation

Economic motivation is very important for both groups. For restaurant owners, TGTG has both direct and indirect economic contributions. TGTG not only helps them monetize the leftovers, but also better sell their products during the pandemic. For them, TGTG constitutes a real recovery strategy and multi-channel approach becomes obvious. Moreover, during the pandemic, thanks to TGTG, they got more visibility.

[...]. My objective is to maximize my revenue. During the pandemic, especially during the lockdown, TGTG helped me reach a different segment of clientele who lives not far from my business. (RO15)

TGTG helped me reach the locals during the pandemic. I have developed a good relationship with the locals living not far from my restaurant [...]. (RO8)

[...]. We were not allowed to open our restaurant and only take-away was allowed. TGTG helped me maximize my sales [...]. (RO2)

I consider TGTG as an additional distribution channel because it allowed me to reach a new market segment [...]. When people came to pick-up their baskets, they often buy drinks and other items [...]. (RO6)

People usually use the TGTG service because it is cheap, but most of them come back later directly [...]. TGTG helped me to get known and generate more revenue [...]. (RO14)

Most of customers use TGTG because it allows them to eat cheap from different quality restaurants.

I can have a meal for only 4 euros. It is very cheap [. . .]. (C22)

[. . .]. I do not have enough money to often buy from restaurants, but the TGTG allowed me try different restaurants for a little money [. . .]. (C10)

During the lockdown, I often used TGTG because it was economical [. . .]. (C14)

5. Discussion and conclusion

This research investigated how a mobile app can be a strategic distribution channel in the time of pandemic by examining the case of TGTG. Using mobile apps in the domains of food sharing and redistribution has become very popular (e.g. Apostolidis et al., 2021; Harvey et al., 2020); however, no study examines the motives of using a mobile app as a strategic distribution channel and as an innovative purchase channel from both the distributors' and customers' perspectives.

This study contributes to the literature on multi- and omni-channel in general and on why retailers and customers adopt a mobile app like TGTG in particular. Additionally, the study was conducted between the two nationwide lockdowns in France. Therefore, this study also contributes to the literature on crisis management.

The research explains how TGTG can be a strategic distribution channel during the pandemic by identifying the different motivations: control and autonomy motivation, health motivation, functional motivation, social motivation, and economic motivation. The economic and social motivations are highly important for the restaurant owners and customers. The social motivation is widely present on the app and we can see the keywords, such as *'anti-food waste', 'get good food', 'X meals to save', 'every second, 51 tons of food are wasted'*, etc. Although most of customers use TGTG app because it is cheap, they also believe that they are doing something positive for the planet by reducing waste and CO_2 emission and for the businesses' recovery. Furthermore, during the pandemic, there was also the health motivation. Customers had the tendency to avoid the food-delivery services, such as Uber Eats, Deliveroo, etc. and preferred to use self-service in order to reduce the risk of contamination. It appears that in the current context of Covid-19, health, economy, and social are the main concerns of not only businesses, but also of customers and employees. This finding is in line with previous studies (e.g. Vo-Thanh et al., 2021).

For restaurant owners, they consider TGTG as a strategic distribution channel. Regarding the customer behavior, most of customers read reviews on TripAdvisor, Yelp, etc. while selecting a restaurant (Zaman et al., 2016); however, during the pandemic, there were restriction on people's movement and customers were looking for solutions close to their home. Therefore, the restaurants were able to target a new clientele: the locals. In addition, there were also some 'billboard effect' and cross-selling for the restaurants.

5.1. Theoretical contributions

First, this research advances the knowledge regarding the debate on developing digital strategies to answer new behaviors, expectations and constraints from customers, and also to take advantage of these strategies. The multi-channel strategy via operating

additional channels, especially mobile ones, might be an interesting way. This strategy can help businesses satisfy not only customers' extrinsic motives, but also their intrinsic ones, particularly in the current pandemic. Theoretically, in line with prior studies (e.g. Hossain et al., 2019, 2020), this research confirms the positive effect of multi-channel strategy on customers' purchases. Theoretically, as mentioned by Hossain et al. (2019, p. 161), 'firms should have different channels available for the customers, inform the customers about its available channels, and make sure that channels are suitable to provide specific services.'

Second, this study contributes to the multi- and omni-channel research by extending SDT to the mobile app adoption context. The findings revealed that the SDT is very relevant to deal with the research purpose regarding the various motivations leading both businesses and customers to adopt a mobile channel as a strategic distribution channel and as an innovative purchase channel, respectively. Hence, in addition to other theories that have already been employed in previous studies to examine why people use food delivery apps (e.g. Ray et al., 2019 with uses and gratification theory), consumer attitudes and purchasing intentions vis-à-vis food delivery platform services (e.g. Chen et al., 2020 with theory of planned behavior and utilitarian and hedonic values) or how food waste mobile apps could boost sustainable value co-creation (e.g. Apostolidis et al., 2021 with affordance and means-end theories and service-dominant logic), drawing upon the self-determination theory this research highlighted the strategic role a mobile app played in the food businesses' multi (omni)-channel distribution strategy and customers' creative purchasing in times of global health crisis.

Finally, the results identified the main motivates in adopting a mobile channel from both distributors and customers. These motivates are deemed as the key success factors of a multi-channel approach in times of crisis. From a theoretical viewpoint, to succeed the integration of a mobile channel (here, a food mobile app) in the time of pandemic, five motivational factors, including control and autonomy, health, functional, social, and economic must be considered. Accordingly, this research extends strategic marketing theories by conceptualizing the motivational factors for a food app's adoption and usage from both businesses and customers perspectives in the time of global health crisis. These motivational factors are fully integrated to the restaurants' multi (omni)-channel distribution strategy and customers' creative purchasing to obtain various outcomes (Figure 2).

5.2. Practical implications

TGTG has started its journey with the restaurants but today this app has also been opened to other sectors such as supermarkets, bakeries, hotels, school and hospital canteens, etc. For example, given the strategic importance to have a multi-channel approach and the global economic difficulty partially caused by the Covid-19 pandemic, supermarkets may follow the example of the restaurants by using TGTG to sell the products those are close to expire. In addition, managers may create separate sections in the supermarkets with the products whose expiry dates are very close and encourage people to buy these products to reduce the waste and CO_2 emission.
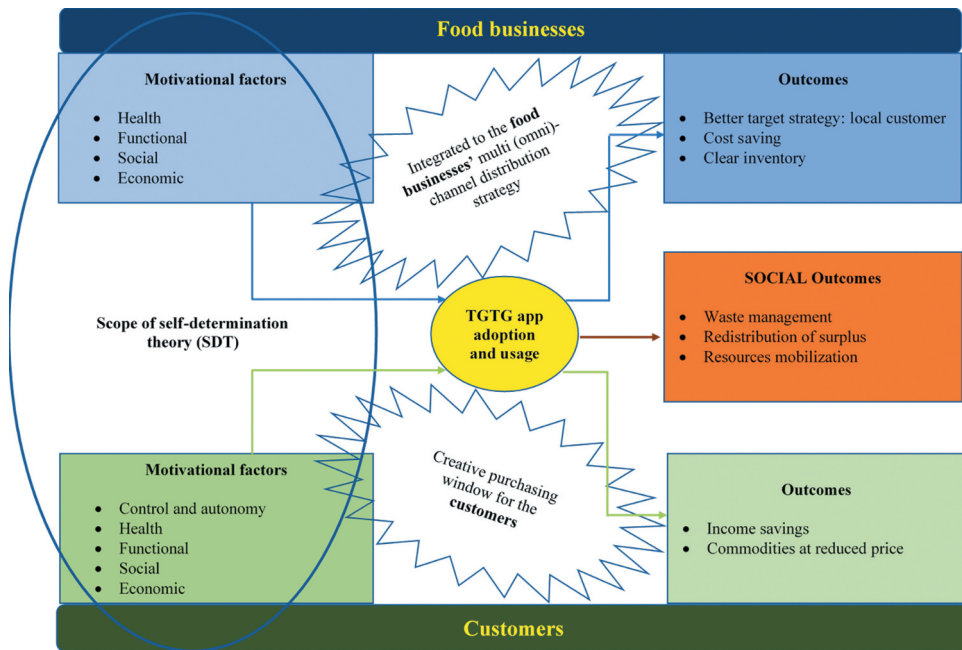
Figure 2. Motivators for a food app adoption and its outcomes in the time of pandemic.

This approach might be an interesting plan to respond to the growing environmental awareness of potential consumers.

The results indicated that most of customers buy additional items while picking up their baskets. Restaurants managers should use this opportunity of cross-selling and adopt their offers accordingly. Given the small price paid by the customers via TGTG, a strategy of cross-selling will help restaurants maximize their revenue.

6. Limitations and future research

This study opted for an exploratory, qualitative research paradigm, which is hampered for results' generalization. However, the aim of this research was to grasp how digital solutions, especially an anti-waste mobile app can be a strategic distribution channel, which is part of a broader multi-channel strategy of companies. Therefore, this limitation does not dilute the study's theoretical and practical contributions.

This research revealed various extrinsic and intrinsic motivates when adopting an app from both the businesses' and customers' viewpoints. However, it did not deal with the relative importance of each of these motivates yet, thus suggesting a new research avenue on this topic with a specific focus on multi-criteria decision making.

Furthermore, this study only focused on French market. Therefore, further studies may consider quantitative data and/or include other countries in order to have more insight about the role of this app in developing a multi-channel strategy during the pandemic. Besides, this research only concentrated on the restaurants, which are the main users of

TGTG (66%) (TGTG International, 2020). It might be interesting to focus on other business providers such as hotels, bakeries, supermarkets, etc. who also deal with the perishable products.

Finally, our study identified various motives in adopting TGTG as the success factors for this app' provider to accomplish social objective and for businesses to achieve their digital strategies. Future research may be handled, examining other apps for other purposes to apprehend other potential success factors, which may enrich this study's findings.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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