



Revista Pensamento Contemporâneo em Administração
ISSN: 1982-2596
jmoraes@id.uff.br
Universidade Federal Fluminense
Brasil

Guarnieri, Fernanda; David Vieira, Francisco Giovanni
FOOD DELIVERY NETWORK: NON-HUMANS AS CONSUMPTION MEDIATORS
Revista Pensamento Contemporâneo em Administração,
vol. 16, núm. 1, 2022, Enero-Marzo, pp. 146-160
Universidade Federal Fluminense
Rio de Janeiro, Brasil

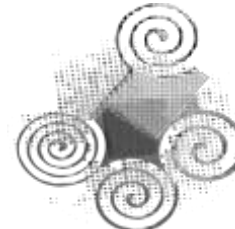
DOI: <https://doi.org/10.12712/rpca.v16i1.53063>

Disponible en: <https://www.redalyc.org/articulo.oa?id=441769582010>

- Cómo citar el artículo
- Número completo
- Más información del artículo
- Página de la revista en redalyc.org

redalyc.org

Sistema de Información Científica Redalyc
Red de Revistas Científicas de América Latina y el Caribe, España y Portugal
Proyecto académico sin fines de lucro, desarrollado bajo la iniciativa de acceso
abierto

**FOOD DELIVERY NETWORK: NON-HUMANS AS CONSUMPTION MEDIATORS**

REDE DE DELIVERY ALIMENTAR: NÃO-HUMANOS COMO MEDIADORES DO CONSUMO

Recebido em 04.02.2022 Aprovado em 08.04.2022

Avaliado pelo sistema double blind review

DOI: <https://doi.org/10.12712/rpca.v16i1.53063>**Fernanda Guarnieri**fernandanguarnieri@gmail.comPrograma de Pós-graduação em Administração/Universidade Estadual de Maringá – Maringá/Paraná, Brasil
0000-0001-5645-7657**Francisco Giovanni David Vieira**fgdvieira@uem.brPrograma de Pós-graduação em Administração/Universidade Estadual de Maringá – Maringá/Paraná, Brasil
0000-0002-6204-0855**Abstract**

The purpose of this theoretical essay is to present an understanding of how the practices of actors in a given network are impacted from the mediation of a digital device. As a contribution to studies of marketing, we present a conceptual framework covering the main actors that make up the food delivery service network. From the propositions, we argue that digital applications of supply and demand for food delivery, through its use, act as mediators between actors, causing the reformatting of market practices and, simultaneously, the institution of new consumption practices involving the entire network in which they operate.

Keywords: Actor-network theory. Consumer studies. Market practices. Apps. Food delivery.

Resumo

O propósito do ensaio teórico é apresentar uma compreensão de como as práticas dos atores de uma determinada rede são impactadas a partir da mediação de um dispositivo digital. Como contribuição para a área de marketing, apresentamos um quadro conceitual contemplando os principais atores que constituem a rede de serviços de delivery alimentar. A partir das proposições, defendemos que os aplicativos digitais de oferta e demanda de entrega de comida, atuam como mediadores entre atores, provocando a reformatação de práticas de mercado e, simultaneamente, a instituição de novas práticas de consumo envolvendo toda a rede em que operam.

Palavras-chave: Teoria ator-rede. Estudos de consumo. Práticas de mercado. Aplicativos. Delivery de comidas.

Introduction

A sound ring at dawn, it is your cell phone's alarm clock.

To end the silence of the day you can select a music album from the music streaming application. The appointments of the day are confirmed in the cell phone's agenda, which is linked to your e-mail. The temperature throughout the day can be checked on the weather channel to see if you need to carry an extra coat or not.

If you go to the bakery for a coffee, you don't need to carry cash to pay, just open the virtual card on your cell phone and approach the card machine.

To get to your appointment, just call a private transportation car. But if you prefer to drive yourself, you can turn on the GPS on your cell phone to know how the traffic is and avoid congestion.

If a bill is due, you can scan the barcode and pay via the bank's application.

While you wait for your meeting to start, you can access the streaming of series and movies and choose according to your preference.

At lunchtime, you can access the different menus on internet food delivery apps and choose your meal...

Technology plays a clear role in the cases exemplified above, promoting a mediation in consumption experiences. All these everyday situations are accessed and experienced using a device, specifically a digital device, known as an application or app that is installed on a smartphone. These examples are manifestations of the connectivity and contemporary digitalization of consumption (Cochoy, Hagberg, McIntyre, & Sörum, 2017).

It is an obvious fact, these are manifestations of an individual, which may differ from one to another, but we cannot fail to observe that there is an increasing delegation of everyday practices to digital technologies (Lehdonvirta, 2012), unfolding in an intersection between digitalization and consumption in our current consumption practices. Shopping activities and comparisons of goods and services are more dependent on the Internet and mobile digital devices, the latter being built on algorithms and artificial intelligence.

This whole process of digitalization did not happen overnight. Smartphones, mobile internet, social media, QR codes, cell phone apps, among many others, have replaced previous spheres of consumption, according to Cochoy et al. (2017). These are the same authors who describe the evolution of this phenomenon, pointing out that since the introduction of computers in homes, the access to the internet, the proliferation of laptops, until we get to tablets and smartphones, the concept of digital is permeated in everyday life. This term - digital - becomes a complement to several aspects of consumption. In line with Cochoy et al. (2017), Hagberg, Sundstrom, and Egels-Zandén (2016) point out that at the beginning of what we can call the digitalization era, some changes went virtually unnoticed by consumers, such as barcodes and ATMs, but today's entire digitalization process involves the consumer.

Digital devices are used by consumers in their consumption practices, such as payment tools, information providers, online stores, social networks, requesting and contracting services. As implications, the use of these devices contributes to format new consumer identities, causing the development of new consumer cultures (Cochoy et al., 2017). The transformation of these digital devices instigates a rethinking of consumers' understanding of choice, their perceptions, practices, subjectivities, and communities, as much as market ideologies, market practices, and innovation (Cochoy et al., 2017).

However, we do not seek to shed light on digitization itself and its entire set of innovations. It is already known that market devices constitute consumption practices and markets (Hagberg, 2016), but we highlight the process of digitization of consumption that involves digital devices, specifically, apps. This digital evolution frames a recognition of the role that materiality and technology play in consumption practices and the marketplace. Following this understanding and emphasizing that this essay is located within a marketing perspective, we build our propositions from a combination between studies of consumption and market practices. To complement this theoretical foundation, we resort to the concepts and assumptions of actor-network theory.

With this context in mind, where does the proposal presented here come from if not from the questions that motivated the development of this discussion? We highlight the following questions: how do digital applications (non-human), incorporated into the daily lives of their users (human) of a given network, change the practices of consumption and markets? What are these digital applications that from a change in their nature led to the reformatting of actors' practices in specific networks? How are these changes evolving over time?

Given this, our interest for the development of the proposal to be developed has as a starting point the process through which the app is used and in the practices of the actors that operate in a given network (Cochoy et al., 2017). As already pointed out by Cochoy et al. (2017, p. 2) the "incorporation of digital tools in mundane consumer activities also affects the way we consume other services or goods", as well as influence and are influenced by market reformatting. In this essay, the focus is on the role those digital devices (non-human actors) play in reformatting the food delivery service network. The purpose is to present an understanding of how the practices of the actors in a given network are impacted through the mediation of a digital/technological device. Human and non-human actors and their agency capabilities are analyzed from the assumption that all are intertwined, as in a network, considering especially the technological device that plays the role of mediation in a given social context.

Regarding the structure of the text, this essay is organized as follows. In the next section, we present the main concepts and assumptions that underlie ANT, emphasizing its contribution to the studies of consumption and market practices. After that, we complement the discussion with what concerns the digitalization of consumption and delivery applications, to then present a conceptual framework with theoretical propositions contemplating the main actors that constitute the food delivery service network. The sessions are followed by the final considerations.

Consumer and market studies and the actor-network theory

Consumer studies in the marketing context face some controversy about who and what consumers are, how they think and act, and the way they should be investigated (Cochoy & Mallard, 2018; Maclaran, Hogg, & Bradshaw, 2010). This is because of the focus of the areas of study that we can point to. On the one hand, there are the views that span the fields of economics and psychology, grounded in the cognitive and behavioral schools of thought, which understand the consumer as a rational individual (Cochoy & Mallard, 2018; Kassarian & Goodstein, 2010). On the other hand, there are investigations grounded in theories that seek to understand consumer practices and culture through interpretivist research (Arnould & Thompson, 2005).

Although there are differences in their conceptions, these approaches share the perspective that consumption is based on consumer behavior and, therefore, understanding about markets consists in investigating consumers and their logic, being cognitive or calculative schemes (areas of economics and psychology) or consumer culture (Cochoy & Mallard, 2018). Considering consumer studies, we observe that until then there have been contributions regarding immaterial issues, feelings, ideologies, knowledge, and others (Cochoy, 2019; Cochoy & Mallard, 2018).

Building on the above, Cochoy and Mallard (2018) make an analogy between marketing, biology, and agriculture, bringing to our area of study the idea of cultivating. From this proposal the authors suggest considering consumer culture as a process. This means emphasizing "consumer cultivation" rather than "consumer culture". In other words, the meaning of the term cultivation refers to the going back and forth interactively in different processes, from the conception of a given product to its consumption.

Assuming that in seeking to understand consumers and their consumption practices it is necessary to analyze what consumers consider, Cochoy and Mallard (2018) question, "is not marketing about cultivating consumers by using different means and devices that play on consumers' dispositions, of course, but that also shape and redefine them?" (Cochoy & Mallard, 2018, p. 385). Having presented the

question, they themselves point the way to the answers, arguing that Actor-Network Theory (ANT) is able to answer the question presented.

Therefore, when talking about markets, TAR and its assumptions were used as initial knowledge in discussions that encompass the constitution and construction of markets from references of economic sociology, as work developed by Michel Callon (Araujo, 2007; Çalışkan & Callon, 2010; Callon, 1998), in reference to the perspective of Constructivist Market Studies (CME). As pointed out by Mason, Kjellberg, and Hagberg (2015), market studies in their constructivist conception have the concern with regard to the performativity of marketing. The reason for this, and also the one we bring to the development of this essay, is that practices, activities and what has been performed in a given context unfold in effects in specific markets.

From the CME perspective, market agents are hybrid collectives that possess capacities to act according to their constitution. And market objects and devices are central to this constitution, just as they shape and are shaped by market practices (Geiger et al., 2012). Moreover, in the constructivist perspective, attention is directed to the material bases of actors' agency capacity (Nøjgaard & Bajde, 2020). This justifies the interest in understanding how relationships between various material entities are concretized through market practices, since the latter make it possible to explain how consumers, goods, money, advertisements, firms, and others are configured in the market (Nøjgaard & Bajde, 2020).

Actor-Network Theory is aligned with object-oriented ontologies and provides subsidies for understanding non-human entities that reconfigure who actors are and what they do (Latour, 2012). Moreover, it allows us to broaden what consumer research is, going beyond just studying the consumer (Cochoy & Mallard, 2018). If when investigating the consumer, their behavior is considered, as well as the cultural frames that guide their social context, we need to broaden this horizon and, according to Cochoy (2019), understand consumption as the result of a complex and situated network of interactions between different actors, such as market professionals, market devices (Muniesa, Millo, & Callon 2007), and consumers (Araujo, Finch, & Kjellberg, 2010; Cochoy & Dubuisson-Quellier, 2013).

In other words, ANT proposes to simultaneously investigate market practitioners, market devices, and consumers, enriching analyses that encompass the entire consumption process (Cochoy & Mallard, 2018). Actor-Network Theory is like an intersection between anthropology, sociology and psychology studies - consumer behavior/research (Cova & Cova, 2009), expert knowledge and economic exchanges, marketing managers, retailers, traders and logistics - marketing professionals (Araujo et al., 2010; Cochoy & Dubuisson-Quellier, 2013) and product innovation, marketing devices, packaging, price tags and others - market devices (Cochoy, 2008, 2015).

As mentioned earlier, there is a relationship of interactions between these actors and each has its own capacity for agency, which means to say that none has total dominance over others and neither with what happens in the market (Cochoy, 2019). It is prudent to point out that consumers have their preferences and autonomy. However, this does not mean to say that they buy or acquire something on their own. There is interaction with other market actors and devices. Just as marketers make plans that may or may not be successful. And the devices act according to designers' plans or in unexpected ways.

ANT comes to complement consumer and market studies approaches, challenging researchers to also shed light on the association that exists between individuals and objects, as much as their interactions and trajectories (Braga & Suarez, 2018). This is where the challenge of ANT lies. According to Braga and Suarez (2018), its understanding goes beyond its concepts and terms, to the way the researcher is focused on his or her research object.

Among the main names of ANT are Michel Callon (1986), Bruno Latour (2012) and John Law (1986). The three authors conceived ANT from a sociology of associations, having as main objective the discovery of original institutions, procedures and concepts with appropriate conditions to collect and

regroup the social (Braga & Suarez, 2018). Therefore, common to object-oriented ontologies, ANT values things, avoiding hierarchies that grant privileges to human agency (Braga & Suarez, 2018).

In the ANT perspective, "things are more than tools, backdrop or stage on which human social actors play the main roles" (Braga & Suarez, 2018, p. 219). Latour (1994) breaks with the subject-object duality, assuming symmetry between both human and non-human actors. This means saying that objects also have agency, as they are "associated in such a way that they make other actors do things" (Latour, 2012, p. 158). It is in this sense that Latour (2012) attributes the understanding of hybrid, because the result of actions comes from a certain association of actants or agents. For the author, it is necessary to avoid the mistake of analyzing either the subject or the object, as advocated by materialists and sociologists (Latour, 2001).

Latour (2012) emphasizes the understanding that objects do not represent only something with meaning, but "whose materiality brings agency and specific characteristics that are as relevant as the symbolic ones" (Braga & Suarez, 2018, p. 219). For ANT, the actor is that which performs an action and modifies a given circumstance, and the actions constitute the social connections of the networks to which these actors are inserted. Therefore, ANT transcends the duality between subjects and objects, persons and things, assuming as assumption that objects have agency capacity (Preda, 1999).

This transcendence leads to the principle of generalized symmetry, in the sense of assigning the same analytical level to both human and non-human actors, avoiding overlapping from one part to another (Latour, 2012). It should be noted at this point that ANT emphasizes agency more than structure. Therein lies the meaning to the attribution of the term actor-network, where the hyphen is used to represent a single entity (Braga & Suarez, 2018). Through the lens of ANT, we cannot consider humans in a privileged condition to non-humans, since material and human elements are constituent parts of the same network (Tureta & Alcadipani, 2009), and both have importance in terms of behavior, history, technology and identity.

Echoing the principle presented by Latour (2012), Callon points out three fundamental principles in his approach, drawing attention to why and how we can consider non-human entities in sociological analyses. Callon's approach is based on three fundamental principles: generalized agnosticism, generalized symmetry, and free association. The first principle aims to encourage researchers to question the natural causes, such as the social forces that must determine the observed phenomena. The second principle contributes to the understanding of the first, since for Callon a project results in a combination of material and social forces, since human and non-human entities participate in any action and should be treated symmetrically. It is because of this that "scientific discoveries and innovations are not the results of pure social processes, but the results of a 'successful alignment' between human and non-human agencies" (Cochoy & Mallard, 2018, p. 386). Thus, we come to the third principle - free association. For Callon, all the actors and actions that make up a network must be observed, since all these elements are involved in a given practice.

In view of this reintegration of objects into sociological analyses, it is necessary to bring into discussion the concept of action. "Human actions involve material things that play a central role in elaborating and stabilizing the social order" (Cochoy & Mallard, 2018, p. 387), which is why "no human relationships exist without things contributing in their texture, extent, and meaning" (Cochoy & Mallard, 2018, p. 388). The arguments of the cited authors are in line with what Latour (2001) postulates about the concept of action. For the author, "action is not a property of humans, but of an association of actants", the actants (Latour, 2001, p. 210, emphasis added).

Thinking about this, how do objects contribute in a given context of relational action with individuals? For Latour (1996), we can consider three ways in which objects appear present in action: as invisible tools, as a determining superstructure, and as a projection screen. In the first case, the object does not add something to the action, it appears as a means to the action. In the second, besides acting

autonomously, the object belongs to a material context that determines the action, because they are interconnected. And in the third case, the objects reflect the social condition of the individual and serve as a basis for distinction.

It is in this sense that Callon calls attention to the concept of translation, arguing that in a research that seeks to understand action, there is no need to focus on sociological knowledge without first listing those involved in the network, describing their connections and knowing whether a given entity is human or not. Latour also presents his formulation of what ANT implies in the philosophy of action, with translation being an essential concept for its understanding.

Translocation is defined as an action whereby one actor moves another on a path from its original position and goal, leading it to a different position or toward other goals (Cochoy & Mallard, 2018; Latour, 1994). In other words, translation refers to the movements of actors that occur in the network (Latour, 2012). Such movements emerge from the interests and possibilities of the actors, who alter, restrict, and negotiate with the aim of conquering something (Braga & Suarez, 2018). Consequently, there is no neutrality in translational processes, there is always a transformation of the actors as an unfolding. Therefore, Latour, Callon, and Law emphasize that understanding this concept is essential to understand actor-network theory, since actors are not pre-existing and determined substances and entities. But differently, they are events that occur inseparably from the relationships specified in the network.

A key issue in the ontological conception of ANT is the interest in entities, in reference to the facts, artifacts, technology, institutions, and others, that exist or emerge through performative practice among the relations in a given network (Lugosi & Quinton, 2018). Entities are socio-materially constructed, indicating that they are never completely finished, but are (re)constructed and (re)organized from a performative process (Lugosi & Quinton, 2018). The notion of performativity, according to Callon (1998), highlights language, behaviors, bodies, materials, and technologies declared as "things." These things are present in constant practices through which the world is made comprehensible.

Given what has been exposed so far, we highlight that ANT enables us to redefine the understanding about consumption and market. Making analogy with what Cochoy and Mallard (2018) indicated as consumer cultivation, it is the identification of two alternatives that are presented to overcome the risks found in consumer studies approaches. The first concerns the reduction of consumption of objects as mere symbolic signs, and the second is the divide between consumers and marketers. What the authors argue is that the actor-network approach in consumer studies both contributes to recognizing the agency and centrality of objects in a relationship with human actors and to leveling the asymmetry between consumers and market professionals.

Moreover, the meaning of the expression cultivation is also presented as a way to show that consumption occurs in innovation networks and in social spaces of consumption. And in this sense, having the fundamentals of ANT we can understand decisive elements present in this dynamic between innovation and consumption. Innovation follows a trajectory that is continuously shaped and transformed through which the product, the entities that developed it, and their actions occur (Cochoy & Mallard, 2018). In this trajectory, the product (object) participates in actions with human actors, so it is worth noting that no movement occurs without transformation.

Related to objects, we shed light on digital devices, as these provoke new types of consumption, new repertoires of skills and abilities (Jenkins & Denegri-Knott, 2017). "This does not mean that consumers have become less skilled, but that their skills have been redistributed between people and technology that occur in practice" (Jenkins & Denegri-Knott, 2017, p. 86). Like shopping carts (Cochoy, 2008), the freezer (Hand & Shove, 2007), the water bottle (Brei & Tadjewski, 2015), the digital device absorbs some skills, knowledge, and agency that were previously embedded in individuals' practices. This brings us to the understanding of hybrids.

Digital devices and consumers form a hybrid cognitive system. Moreover, the implementation of devices in the market contributes to the growing research from "market agencement" to "market agencing" (Callon, 2015; Cochoy, Trompette & Araujo, 2016). This is to say that the emphasis falls on the processes through which the agency of heterogeneous materiality is engaged and combined in ways that shape the actions of actors present in a given network. Therefore, it is necessary to understand the ensemble that encompasses consumers, market knowledge, devices, and user practices (Cochoy & Mallard, 2018).

Digitalization of consumption practices and markets

To shed light on the transformation of consumer and market practices through digitalization, we take on the definition of the latter term as the "integration of digital technologies into everyday life by digitizing everything that can be digitized" (Hagberg et al., 2016). This is a general definition, encompassing all types of digital technologies, but we focus on what concerns the integration of digital applications, into the everyday practices of actors in a particular network, food delivery services.

The idea of a digitalization process of consumption practices and markets represents a transformation regarding what already existed in relation to actors, processes, practices, and devices (Hagberg et al., 2016). Because of this transformation, new products and services have emerged in the market. A transformation from analog to digital has occurred, as exemplified by Hagberg et al. (2016), such as the increase in ATMs and the facilitation of new forms of value creation, as well as accessibility, availability, and transparency, as noted by Amit and Zott (2001).

In fact, the use of this term - digitalization - refers to a process, and it is in this sense that we propose this discussion. In addition, we emphasize two aspects of this understanding. First, looking at this process enables us to grasp the network as a whole, both in demand and in supply, expanding the boundaries of consumer studies that focus especially on consumers and their practices (Cochoy et al., 2017). Second, understanding digitization rather than digital means that it is a process that is in continuous transformation, has no objectively determined beginning, let alone its end (Fors, 2009; Hagberg et al., 2016).

Similar to Moisander and Eriksson's (2006) understanding of information society, the digitalization of consumption is not something imposed on individuals and organization but is something that individuals and organizations do and produce through their everyday practices and social interactions. These productions are not necessarily intentional, since they occur through collective conventions about a particular practice in a specific social context. This leads us to practices that constantly emerge.

If we go back to the 1990s, for example, very few people would say that everyday situations could be followed in real time and on a global scale (Fors, 2009). However, nowadays it is not unusual to see people socializing through social media, walking and looking at a cell phone screen, experiencing a virtual reality, researching and buying virtually among other practices, as illustrated in the beginning of this essay. But, for all these practices to be performed, there is the interrelation with a device, especially digital devices.

Digital devices are becoming ubiquitous in our daily lives due to the great expansion of electronic communication devices such as cell phones, music players, and other internet access devices (Shankar, Venkatesh, Hofacker & Naik, 2010). With the multiplication of such devices, the uptake of the services offered through them has also undergone great expansion (International Telecommunications Union, 2018).

One change arising from the process of digitization of consumption is the way of ordering the delivery of a meal. While almost all restaurants in the United States were using the paper menu, some restaurants in Los Angeles, California in 2017 implemented the use of delivery service apps and achieved great results in their financial revenues, approximately 35% growth (Cho, Bonn & Justin, 2019). From these records,

the expansion of the app was inevitable. In Brazil, the number of people who ordered food through apps grew from 26% in 2016 to 58% in 2019 (EMarketer, 2019). Already in the year 2020, the numbers represent 64%¹.

It should be noted, in addition to these indicators, that digitalization being permeated in our consumption practices, implications have occurred with regard to our everyday dining practices. Therefore, once the discussion about the conception and role of non-human actors, based on consumption studies and actor-network theory, has been made, and having then described the aspects of digitalization of consumption practices and markets and the numbers of use of digital food delivery service apps, we can have a dimension that the understanding about consumption and market involves a set of meanings, but also the place where practices, objects and interactions occur that shape the actions of the actors present to a given network. From now on we develop the theoretical propositions that emerge from the analyzed context.

Conceptual framework and theoretical propositions

To shed light on the transformation of consumer and market practices through digitalization, we take on the definition of the latter term as the "integration of digital technologies into everyday life by digitizing everything that can be digitized" (Hagberg et al., 2016). This is a general definition, encompassing all types of digital technologies, but we focus on what concerns the integration of digital applications, into the everyday practices of actors in a particular network, food delivery services.

Assuming as background one of the assumptions of ANT, the proposed conceptual framework is developed considering that in a network with the goal of achieving a certain social task, there is a heterogeneity of actors, human and non-human, which are associated with each other. Previously to the presentation of the conceptual framework, we represent, in a general way, the process of requesting meal orders performed through deliveries.

As indicated in Figure 1, there was a beginning, with the decision to place the order. At this first moment, in cases of group ordering, there was the choice of the person responsible for the call, to, in fact, place the order. After that, the process unfolded in a linear way. For each action the consumer or the supplier is the actor who initiates it, as indicated in the figure legend. It is noteworthy that the devices appear unobtrusively in their relations with the human actors. They are used as tools to carry out the order, such as the telephone, the motorcycle, during delivery, and other examples.

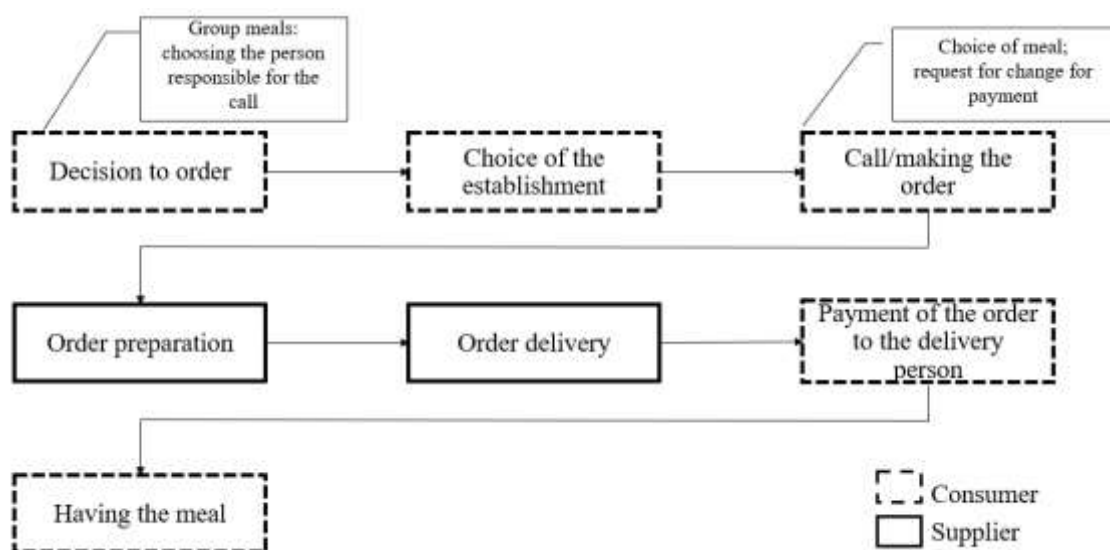


Figure 1. Delivery request process prior to the emergence of the applications

However, when we observe Figure 2, we see a complex network of interactions and interlacements, in which the configuration of an actor influences another, as in a relational action, according to Latour (2001, 2012). This network, object of analysis in this essay, is represented with the objective of capturing the main actors that constitute the food delivery service network.

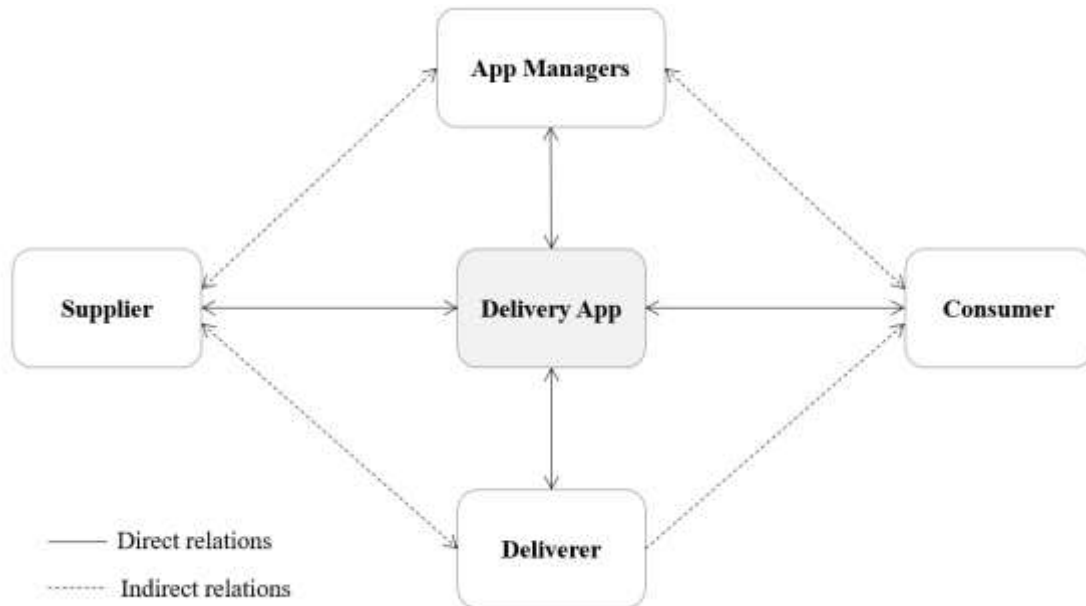


Figure 2. Conceptual Model: Food delivery service network

When looking at a particular network, we should be aware that in the ANT conception, they “are not networks in a substantive or technical sense of stable systems connecting enduring entities” (Bajde, 2013, p. 228), but are associated configurations that help us track and understand an action (Latour, 2012). This is the principle of ANT, which focuses on the outcomes of engaging a network of people and things. Therefore, as Bajde (2013) illustrates, there is no consumer outside relations with other people, objects and meanings that construct the subjects, objects, devices, spaces, and times.

Using Hodder's (2012) description, just as humans depend on things to extend what they can do, things depend on humans to maintain them. In the same logic, humans depend on other humans when it comes to their social coexistence. And things depend on other things, once put together they perform complex work, such as, for example, cars and computers.

In view of this, the dynamics of the digitalization of consumption help explain these relationships. The food delivery service network depicted in Figure 2 indicates the incorporation of a new actor, the digital app, as highlighted. Its incorporation transforms the network, and therefore, we present and develop the following propositions:

Proposition 1: The new configuration of communication devices, motivated by advances in digitalization, constitutes new forms of relationships between actors operating in a network, specifically food delivery services network.

Proposition 2: The reformatting of relationships between actors unfolds in changes in their practices of supplying and demanding food delivery services.

Proposition 3: Digital food delivery supply and demand apps, through their use, act as mediators between actors, causing the reformatting of market practices and, simultaneously, the institution of new consumption practices involving the entire network in which they operate.

New configurations of non-human actors and the relational changes in the network

As indicated in Figure 2, there is an actor acting as a mediator of the relationships between the other actors. This actor is the delivery service application, a device, a non-human actor, that makes itself present in the network and shapes everyday activities. As a mediator, this actor is visible in the network, transforming, translating, distorting, and modifying the meaning or elements they convey (Latour, 2012). Mediation as a process highlights relationships, making it possible to observe the transformations that occur through the associations of actants (Oliveira & Valadão, 2018).

At this point, we resume the concept of translation mentioned earlier, since we can take it as a subsidy to understand the events and the actors in the network in question. According to Latour (1994), this process of translation that enables mediation is the link created that did not exist before, and then, modifies the two elements or agents that are involved in the same relationship. The combination of interests between the actors results in a composite goal and the creation of a new mix (Latour, 2001).

When looking at how changes have evolved over time, we can go back a few years to when orders for delivery services were placed over the phone. A few years ago, the way of ordering for the same purpose - to receive a meal at a certain location - was and is being remodeled. Simultaneously with the evolution of the cell phone, which has become a smartphone, delivery apps have emerged. Through digitalization, the order request and delivery system has been remodeled from what was already happening before. And this has taken new forms with the proliferation of mobile devices in the daily lives of users.

In a way, the previously used device did not disappear, but was transformed into a new type, with new settings and configurations that caused the reorganization of associations in the network. With the growing digital technology, smartphones represent the transmitters of new communication capabilities, which has been extended to the different actors. The everyday use of these digital devices has a direct impact on the way actors relate to and are associated with.

It is because of this that we advocate about the changing relationships between actors and their associations. With the digitalization of consumption, there have been (and are being) changes in roles and responsibilities, as well as in the agency capacity among actors (Hagberg et al., 2016). The boundaries that imposed greater dominance for the suppliers' side have blurred, reducing the asymmetry of power in the same network. Put another way, the supplier-consumer relationship has undergone transformations. This is because the proliferation of digital technology, internet and, consequently, digital devices are related to the growth of consumer power, reducing the existing asymmetry (Labrecque, Mathwick, Novak, & Hofacker, 2013).

A device, which at first was designed for the purpose of mobile communication in line with the digitalization process, has been transformed and has contributed to transforming and redefining the entire network, and consequently, its associations. The reason for this observation is the fact that the concepts of calculation (Callon & Muniesa, 2005; Callon, 1998), qualculation (Callon & Law, 2005; Cochoy, 2008, 2019) and calquation (Cochoy, 2008, 2019) help explain the relational changes in the network in question. Digital food delivery service apps are constructed with a diversity of choices of providers (restaurants, snack bars, bakeries, and others) who indicate the prices of their meals or dishes. Through the selection, the consumer adds the chosen meal to his virtual cart and is able to check the price of each item and the total price of his purchase. Furthermore, the cart can be altered by updating, removing, or adding items in line with the payment terms. Besides these processes related to rational economic exchange, is the payment method, which is totally virtual, with the use of cards. These practices are related to the concept of calculation.

With regard to planned cognitive processes, qualculation, there is a qualitative appreciation that involves the actions of consumers. Here there is a comparison between one supplier and others, even if offering

the same meal. The comparison may involve the estimated time of delivery of the order, the additional amenities offered. And finally, implying in the consumer's decision, the concept of calculation, can be verified through the evaluations and comments of other consumers. This is because the decision also involves the idea of collectivity and sharing of views of other actors in the same network.

It should be noted that all relationships occur through the delivery app, so in the first moment, the consumer does not need to be present in the physical location and has autonomy in choosing between one supplier and another without having to leave their place of origin. In the second moment, they are caught in a network that demands calculation and qualculation, from which they can make their decision - calculation. What previously occurred in one dimension, delivery apps have changed this context. Through digital applications suppliers receive different orders at the same time. And the delivery drivers, without necessarily having an employment relationship with the supplier company, identify the place of origin and destination to deliver the order, being able to meet demands from different locations in the same day. This expresses the complexity of the network and the convergence of different human actors, devices, and market strategies.

Changes in the practices of the actors present in the network

As of the new configurations, different delivery service solutions have emerged involving the consumer, the supplier, and the deliverer. Moreover, the digitalization of actors has also occurred, since the nature of human actors has potentially changed and, in the context of this network, should be thought of together with the non-human actor (Hagberg et al., 2016).

Moreover, the digitalization of consumption enables new forms of agency regarding the network of associations in question. The capacity for agency is not only attributed to consumers, delivery people, suppliers, and app managers, but also involves the delivery service app, which acts collectively with the human actors. As for the devices, in their relationship with the actors responsible for the designer, software programming, and discrimination of algorithms, there is the involvement and analysis of the data that shape the information that is/will be reproduced to the other actors, especially those who will place their orders, the consumers. Therefore, there are interactions between the application and the consumer throughout the day, with messages sent at specific mealtimes and, on some occasions, discount coupons. Due to the new configurations, there was a redefinition of the actors' behaviors and their forms of interactions, so we point out that changes have occurred in their practices performed on the network.

In an increasingly fast-paced life, the search for convenience and practicality is easily observed. The connection with mobile devices and, consequently, the use of digital applications is a result of the current mobile connectivity. If we imagine a shopping mall food court, we will notice that it is common among almost all the people there to be looking at a cell phone screen and using some application.

Following this argument, it is a matter of observation the fact that smartphones, the device that allows access to the digital device, is personal, which makes it more than a technological device, but a cultural object (Shankar et al., 2010), that is, it is a constituent part of cultural traditions and everyday practices. Its everyday use makes understanding digital devices as an extension of their users, rescuing the concept of hybridization of consumption. Therefore, with the digitalization of consumption, new technologies emerge, new markets emerge, and others change, as well as new social conditions are adopted by individuals. All this instituted by the digital application used by the actors that integrate the same network.

Reshaping market practices and instituting new consumption practices

Importantly, this proposition enables us to understand how digital devices move beyond the boundaries of an exclusively personal domain into sociocultural domains (Cochoy, Licoppe, McIntyre, & Sörum, 2020). When practices of communicating, buying, contracting services, and relationships are mediated by

digital devices, as Cochoy et al. (2020, p. 8) point out, "the meanings given to such practices change in fundamental ways."

By recognizing that the digitalization of consumption, which occurs through how digital technologies interact in the spheres of consumption and its practices, it is understood that from the use of the apps in question, new cultural practices emerge between consumers and apps and between apps and markets. Because of this, changes are observed with respect to consumption demand and supply, consumption norms, issues related to culture, economy, and markets (McIntyre, 2017; Sörum & Fuentes, 2017). Here, it is a matter of observation that the digital app, like other devices already investigated in previous research, contributes both to shaping different practices and can also be transformed by such practices (Hagberg, 2016). This is because the agency of a particular actor is demonstrated through its relationship with other elements that are intertwined in the same network.

Moreover, new market devices are related to market innovations, which alter relationships and directly influence market actors (Cochoy et al., 2020). In other words, the current process of digitization opens margins for new consumption and market practices, the latter being enabled by digital app technologies.

Concluding remarks

The purpose of this essay was to present an understanding of how digital applications of supply and demand for food delivery, through their use, act as mediators between actors, causing the reformation of market practices and, simultaneously, the institution of new consumption practices involving the entire network in which they operate. Based on the theoretical concepts of ANT and the intersection between consumption and the market, in line with the multiple practices present in the network, we seek to develop a conceptual framework and its implications in a context of digitalization of consumption.

The digitization of consumption and the emergence of digital applications as a market device leads to changes in the configuration of other actors and, consequently, triggers other mutual changes that evolve over time. Therefore, it is important to emphasize that the delivery service already existed, but different from the way it currently occurs, which undergoes a reformatting. Currently, applications are ubiquitous in the daily life of human beings due to the great expansion of electronic communication devices.

The main implication of understanding the complexity of networks is based on the associations between the different elements, in line with what Latour and Callon present as the principle of symmetry. In addition to social relationships, we are inserted in a context with a diversity of non-human actors, and the non-consideration of the latter results from limited analyzes regarding our abilities (Latour, 2012). In addition, it was assumed that the actors present in the network have agency in the translations. When considering the mediation of the network taking place through the application, it is observed how a non-human actor, associated with the other actors, can influence the way in which the actors operate in the network. Simultaneously, this non-human actor can also be influenced by other actors. The network's complexity and heterogeneity were only apprehended through the analysis of the main actors present in the network, as stated by Callon (1986) regarding the principle of free association.

In view of this, considering that an actor performs an action and modifies a given circumstance, it can also be said that some factors boosted the network observed in this theoretical study. The drivers emerged from a favorable conjuncture, which combine the rise of smartphones, technological advances in digital media and mobile internet, online payment options and the increase in demand for delivery services, as occurred from the which was presented by the needs of practicality and convenience of users. All these drivers resulted from human and non-human actions that intervened in the construction of the market and, consequently, in market practices.

Therefore, understanding the nature of objects and their agency capabilities makes it possible to analyze different perspectives, as it opens new avenues for questions about market logic and marketing strategies.

Furthermore, following the logic of Latour and Callon when examining the agency of non-human actors, we will be able to understand their relationship with consumers and other actors. This is going beyond the boundaries that limit studies within the dynamics of innovation and exploring other implications and contributions that involve materiality and technology in studies of consumption practices and markets.

Referências

- Amit, R., & Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, 22, 493–520. <https://doi.org/10.1002/smj.187>
- Araujo, L. (2007). Marketing Theory Markets, market-making and marketing. *Marketing Theory*, 7(3), 211–226. <https://doi.org/10.1177/1470593107080342>
- Araujo, L., Finch, J., & Kjellberg, H. (2010). Reconnecting marketing to markets: an introduction. In L. Araujo, J. Finch, & H. Kjellberg (Eds.), *Reconnecting marketing to markets* (pp. 1–12). Oxford: Oxford University Press.
- Arnould, E. J., & Thompson, C. J. (2005). Consumer culture theory (CCT): twenty years of research. *Journal of Consumer Research*, 31(4), 868–882. <https://doi.org/https://doi.org/10.1086/426626>
- Bajde, D. (2013). Consumer culture theory (re)visits actor–network theory: flattening consumption studies. *Marketing Theory*, 13(2), 227–242. <https://doi.org/10.1177/1470593113477887>
- Braga, C., & Suarez, M. (2018). Teoria Ator-Rede: novas perspectivas e contribuições para os estudos de consumo. *Cad. EBAPE.BR*, 16(2), 218–231.
- Brei, V., & Tadajewski, M. (2015). Crafting the market for bottled water: a social praxeology approach. *European Journal of Marketing*, 49(3/4), 327–349. <https://doi.org/http://dx.doi.org/10.1108/EJM-03-2013-0172>
- Çalışkan, K., & Callon, M. (2010). Economization, part 2: A research programme for the study of markets. *Economy and Society*, 39(1), 1–32. <https://doi.org/10.1080/03085140903424519>
- Callon, M. (1986). The sociology of an actor-network: the case of the electric vehicle. In M. Callon, A. Rip, & J. Law (Eds.), *Mapping the dynamics of science and technology: sociology of science in the real world* (pp. 19–34). Basingstoke: Palgrave Macmillan.
- Callon, M. (1998). *The laws of the markets*. Oxford: Blackwell Publishers.
- Callon, M. (2015). Revisiting marketization: from interface-markets to market- agencements. *Consumption Markets & Culture*, 19(1), 17–37. <https://doi.org/10.1080/10253866.2015.1067002>
- Callon, M., & Law, J. (2005). On qualculation, agency, and otherness. *Environment and Planning D: Society and Space*, 23(5), 717–733. <https://doi.org/10.1068/d343t>
- Callon, M., & Muniesa, F. (2005). Economic markets as calculative collective devices. *Organization Studies*, 26(8), 1229–1250.
- Cho, M., Bonn, M. A., & Justin, J. (2019). Differences in perceptions about food delivery apps between single-person and multi-person households. *International Journal of Hospitality Management*, 77, 108–116. <https://doi.org/10.1016/j.ijhm.2018.06.019>
- Cochoy, F. (2008). Calculation, qualculation, calculation: shopping cart arithmetic, equipped cognition and the clustered consumer. *Marketing Theory*, 8(1), 15–44. <https://doi.org/10.1177/1470593107086483>
- Cochoy, F. (2015). Consumers at work, or curiosity at play? Revisiting the presumption/value cocreation debate with smartphones and two-dimensional bar codes. *Marketing Theory*, 15(2), 133–153. <https://doi.org/10.1177/1470593114540676>
- Cochoy, F. (2019). The cultivation of market behaviors and economic decisions: calculation, qualculation, and calculation revisited. In F. F. Wherry & I. Woodward (Eds.), *The Oxford Handbook of Consumption*. Oxford: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780190695583.013.13>
- Cochoy, F., & Dubuisson-Quellier, S. (2013). The Sociology of market work. *Economic Sociology: The European Electronic Newsletter*, 15(1), 4–11.

- Cochoy, F., Hagberg, J., McIntyre, M. P., & Sörum, N. (2017). Digitalizing consumption: introduction. In Franck Cochoy, J. Hagberg, M. P. McIntyre, & N. Sörum (Eds.), *Digitalizing consumption: how devices shape consumer culture* (1st ed., pp. 1–19). London: Taylor & Francis.
- Cochoy, F., Licoppe, C., McIntyre, M. P., & Sörum, N. (2020). Digitalizing consumer society: equipment and devices of digital consumption. *Journal of Cultural Economy*, 13(1), 1–11. <https://doi.org/10.1080/17530350.2019.1702576>
- Cochoy, F., & Mallard, A. (2018). Another consumer culture Theory. An ANT look at consumption, or how “Market-things” help “cultivate” consumers. In O. Kravets, P. Maclaran, S. Miles, & A. Venkatesh (Eds.), *The Sage handbook of consumer culture* (pp. 384–403). London: Sage Publications.
- Cochoy, F., Trompette, P., & Araujo, L. (2016). From market agencements to market agencing: an introduction. *Consumption Markets & Culture*, 19(1), 3–16. <https://doi.org/10.1080/10253866.2015.1096066>
- Cova, B., & Cova, V. (2009). Faces of the new consumer: a genesis of consumer governmentality. *Recherche et Applications En Marketing*, 24(3), 81–99. <https://doi.org/10.1177/205157070902400304>
- EMarketer. (2019). *Smartphone owners in Brazil who have ordered food via smartphone apps*. Retrieved July 10, 2019, from <https://www.emarketer.com/Chart/Smartphone-Owners-Brazil-Who-Have-Ordered-Food-via-Smartphone-Apps-March-2016-March-2019-of-respondents/229160>
- Fors, A. C. (2009). The beauty of the beast: the matter of meaning in digitalization. *AI and Society*, 25(1), 27–33. <https://doi.org/10.1007/s00146-009-0236-z>
- Geiger, S., Kjellberg, H., & Spencer, R. (2012). Shaping exchanges, building markets. *Consumption Markets and Culture*, 15(2), 133–147. <https://doi.org/10.1080/10253866.2012.654955>
- Hagberg, J. (2016). Agencing practices: a historical exploration of shopping bags. *Consumption Markets & Culture*, 19(1), 111–132. <https://doi.org/10.1080/10253866.2015.1067200>
- Hagberg, J., Sundstrom, M., & Egels-Zandén, N. (2016). The digitalization of retailing: an exploratory framework. *International Journal of Retail & Distribution Management*, 44(7), 694–712. <https://doi.org/http://dx.doi.org/10.1108/IJRDM-09-2015-0140>
- Hand, M., & Shove, E. (2007). Condensing practices: ways of living with a freezer. *Journal of Consumer Culture*, 7(1), 79–104. <https://doi.org/10.1177/1469540507073509>
- Hodder, I. (2012). Humans Depend on Things. In I. Hodder (Ed.), *Entangled: an archaeology of the relationships between humans and things* (pp. 15–39). Chichester: Wiley-Blackwell.
- International Telecommunications Union. (2018). *Measuring the information society report*. Retrieved July 10, 2019, from <https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2018/MISR-2018-Vol-1-E.pdf>
- Jenkins, R., & Denegri-Knott, J. (2017). Extending the mind: digital devices and the transformation of consumer practices. In F. Cochoy, J. Hagberg, M. P. McIntyre, & N. Sörum (Eds.), *Digitalizing consumption: how devices shape consumer culture* (pp. 85–102). London: Taylor & Francis.
- Kassarjian, H. H., & Goodstein, R. C. (2010). The emergence of consumer research. In P. Maclaran, M. Saren, B. Stern, & M. Tadajewski (Eds.), *The Sage Handbook of Marketing Theory* (pp. 59–73). Los Angeles: Sage Publications.
- Labrecque, L. I., vor dem Esche, J., Mathwick, C., Novak, T. P., & Hofacker, C. F. (2013). Consumer power: evolution in the digital age. *Journal of Interactive Marketing*, 27(4), 257–269. <https://doi.org/10.1016/j.intmar.2013.09.002>
- Latour, B. (1994). *On Technical Mediation*. *Common Knowledge*, 3(2), 29–64. Retrieved from <http://ecsocman.hse.ru/text/18036068/>
- Latour, B. (1996). On Interobjectivity. Mind, Culture, and Activity: *An International Journal*, 3(4), 228–245. https://doi.org/https://doi.org/10.1207/s15327884mca0304_2

- Latour, B. (2001). *A esperança de Pandora: ensaios sobre a realidade dos estudos científicos*. Bauru: Edusc.
- Latour, B. (2012). *Reagregando o social: uma introdução à Teoria do Ator-Rede*. Salvador: EDUFBA.
- Law, J. (1986). *Power, action, and belief: a new sociology of knowledge?* Abingdon: Routledge Kegan & Paul.
- Lehdonvirta, V. (2012). A history of the digitalization of consumer culture: from Amazon through Pirate Bay to FarmVille. In M. Molesworth & J. Denegri-Knott (Eds.), *Digital Virtual Consumption* (pp. 11–28). New York: Routledge. Retrieved from <http://vili.lehdonvirta.com/>
- Lugosi, P., & Quinton, S. (2018). More-than-human netnography. *Journal of Marketing Management*, 34(3–4), 287–313. <https://doi.org/10.1080/0267257X.2018.1431303>
- Maclaran, P., Hogg, M. K., & Bradshaw, A. (2010). Cultural influences on representations of the consumer research. In P. Maclaran, M. Saren, B. Stern, & M. Tadajewski (Eds.), *The Sage Handbook of Marketing Theory* (pp. 332–352). Los Angeles: Sage Publications.
- Mason, K., Kjellberg, H., & Hagberg, J. (2015). Exploring the performativity of marketing: theories, practices and devices. *Journal of Marketing Management*, 31(1–2), 1–15. <https://doi.org/10.1080/0267257X.2014.982932>
- McIntyre, M. P. (2017). Tracing the sex of big data. In F. Cochoy, J. Hagberg, M. P. McIntyre, & N. Sörum (Eds.), *Digitalizing consumption: how devices shape consumer culture* (pp. 122–143). London: Taylor & Francis.
- Moisander, J., & Eriksson, P. (2006). Corporate narratives of information society: making up the mobile consumer subject. *Consumption Markets & Culture*, 9(4), 257–275. <https://doi.org/10.1080/10253860600921753>
- Muniesa, F., Millo, Y., & Callon, M. (2007). An introduction to market devices. *The Sociological Review*, 55, 1–12. <https://doi.org/https://doi.org/10.1111/j.1467-954X.2007.00727.x>
- Nøjgaard, M. Ø., & Bajde, D. (2020). Comparison and cross-pollination of two fields of market systems studies. *Consumption Markets & Culture*, 1–22. <https://doi.org/10.1080/10253866.2020.1713112>
- Oliveira, V. M. de, & Valadão, J. de A. D. (2018). Entre a simplificação e a complexidade, a heterogeneidade: Teoria Ator-Rede e uma nova epistemologia para os estudos organizacionais. *Cad. EBAPE.BR*, 15(4), 877–899. <https://doi.org/10.1590/1679-395154992>
- Preda, A. (1999). The turn to things: arguments for a sociological theory of things. *The Sociological Quarterly*, 40(2), 347–366. <https://doi.org/https://doi.org/10.1111/j.1533-8525.1999.tb00552.x>
- Shankar, V., Venkatesh, A., Hofacker, C., & Naik, P. (2010). Mobile marketing in the retailing environment: Current insights and future research avenues. *Journal of Interactive Marketing*, 24(2), 111–120. <https://doi.org/10.1016/j.intmar.2010.02.006>
- Sörum, N., & Fuentes, C. (2017). “Write something”: Shaping of ethical consumption on Facebook. In F. Cochoy, J. Hagberg, M. P. McIntyre, & N. Sörum (Eds.), *Digitalizing consumption: how devices shape consumer culture* (pp. 144–166). London: Taylor & Francis.
- Tureta, C., & Alcadipani, R. (2009). O objeto objeto na análise organizacional: a teoria ator-rede como método de análise da participação dos não-humanos no processo organizativo. *Cad. EBAPE.BR*, 7(1), 51–70. <https://doi.org/http://dx.doi.org/10.1590/S1679-39512009000100005>

ⁱ It is important to consider that after this period, the numbers suffered great changes, much due to the context of the coronavirus pandemic. Our goal does not cover the pandemic scenario, since our proposal is to understand the food delivery service network, as well as, consequently, the actions of each actor present there.