A new approach to retailing for successful competition in the new smart scenario

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ABSTRACT

Purpose- This study develops the idea of smart retailing, exemplified in innovative, technology-enriched retail services as part of service-oriented strategies. In particular, the aim is to provide a new integrated framework to understand the emerging retail scenario based on the smart usage of technologies to improve retail service and develop innovation management strategies. This framework will provide a comprehensive understanding the basic forms of smart retailing as the current competitive scenario.

Design/ Methodology/approach- As a viewpoint, this paper employs an interdisciplinary approach, drawing upon the actual challenges in retailing, to propose a new perspective, the smart retailing one, to describe the new competitive scenario and formulates an emerging research agenda.

Findings- The present paper contributes to research on innovation and technology management for retailing by examining the key dimensions of smart retailing, which aims to enhancing retail service quality and retailers' performance.

Originality- The paper explains how current retailing is moving to a smart perspective, and how retail management should be adapted to successfully perform in the current service-dominant logic scenario, as a consequence of increasing consumer involvement in service co-production and the rapid growth of digital technologies.

Introduction

The current information-rich economy, the rapid growth of digital technologies, the search for creative solutions in service production and for consumer involvement in service co-production are dramatically changing the ways that consumers access and consume services and products (Bacile *et al.,* 2014: Eastlick *et al.,* 2012; Oh and Teo, 2012). Informal processes, mechanisms for supporting creativity and innovativeness, and smart and sustainable solutions for users and consumers characterise the modern economy (Anttiroiko *et al.,* 2013). In this context, service has become fundamental for adding value to the product. Technology pull, the main driver of the modern economy, is reflected in an increasing demand for knowledge-intensive service innovations (Kindstrom *et al.,* 2013; Lusch and Spohrer, 2012; Vargo and Lusch, 2017). In response, traditional manufacturing-oriented firms such as IBM have shifted from manufacturing-dominant logic to service-dominant logic (Maglio and Spohrer 2013; Ordanini and Parasuraman, 2011).

In parallel, marketing has moved from the traditional goods-dominant view (which considered the separation of production and consumption, and tangible output as the central concepts) to a service-dominant logic (that considers the centrality of intangibility, exchange processes and relationships). This shift of viewpoint has led to a focus on the consumer who becomes a co-producer of the service (Chathoth *et al.,* 2013; Vargo and Lusch, 2004). That is, consumers actively operate on different resources to (co)create value as opposed to the traditional view of focusing on value-delivery by firms only (Chathoth *et al.,* 2013; Hilton

and Hughes, 2013; Karpen *et al.,* 2012; Lusch *et al.,* 2006; Vargo and Lusch, 2004). This new view emphasises the centricity of consumers and underlines to what extent firms may exploit consumers' talents to deliver superior services able to enhance productivity and business profitability (Heinonen *et al.,* 2013; Ngo and O'Cass, 2013; Teixera *et al.,* 2012).

Focusing on consumers as the starting point for marketing strategies and service management also impacts the retailing process, pushing retailers to reconsider their role as service integrators. Retailers need to develop ad-hoc capabilities for integrating their own knowledge and skills with the ones emerging by interactions with consumers in the development of new customised services (Chathoth *et al.,* 2013; Gustafsson *et al.,* 2012; Lusch *et al.,* 2006). These new services better satisfy consumers' needs due to the level of customisation provided by the clients' involvement in the service co-creation (Ngo and O'Cass, 2013; Pantano and Viassone, 2015; Zwass, 2010). From a managerial point of view, this scenario for future retailing foresees a large usage of self-service technologies that facilitate reducing operating costs, service delivery, and consumer customisation.

Introducing advanced technologies in retailing implies the development of specific innovation management strategies, which, according to the smart retailing concept, should include the reconfiguration of new technologies and resources for making processes "smarter" (Kim *et al.,* 2017; Pantano and Timmermans, 2014; Priporas *et al.,* 2017; Roy *et al.,* 2017; Vrontis *et al.,* 2017). Accordingly, this study aims to provide a deeper understanding of the emerging retail scenario based on the smart usage of technologies. This framework will provide a comprehensive view of the basic forms of smart retailing as the current competitive scenario, by developing the notion of a smart retail process starting from technology-enriched retail services, and providing tools to be used to develop more efficient retail strategies. In particular, this paper contributes to research on innovation and technology management for retailing by examining the key dimensions of smart retailing that may

enhance retail service quality and retailers' performance. From this perspective, the paper provides a new comprehensive framework for understanding dimensions of the smart retailing concept. Specifically, the new framework emerges from the use of smart technology to collect more information, sharing part of this information with consumers, and creating smart partnerships with them, subject to constraints related to organisation, economy, people, technology and market structure. Furthermore, retail change theories (Brown, 1987) constitute a broad theoretical guide in designing the framework.

To our knowledge no previous research has yet encompassed all these factors in a framework, and thus this paper contributes to knowledge development of smart retailing by filling this gap in retailing literature in response to a call for more conceptual (theoretical) papers in the marketing discipline (Yadav, 2010), especially those contributing new theories and knowledge of computer-mediated environments that might have a long-term impact for marketing scholars (Yadav and Pavlou, 2014). Advances in technology broaden our horizons within the discipline of marketing (Zaltman, 2016), as in the case of smart retailing, a dynamic field that suffers from a dearth of scholarly studies (Priporas *et al.,* 2017).

The remainder of the paper discusses the theoretical background by addressing both the key elements and strategies of innovation management, and integrating the related body of literature on innovation-driven retailing, risk management and economic sustainability. The paper then outlines the key features of smart retailing, discusses the main insights, implications for scholars and practitioners, and proposes a possible agenda for further studies.

Retail change theories

Retailing is one of the largest and most diversified industries in the global economy (Kumar, *et al.,* 2017). Retailing is extremely multifaceted in terms of types, formats, firm size, and so on (Evans, 2011). To date, most retailing institutions and practices are evolutionary (Evans,

2011; McArthur *et al.,* 2016; Pantano *et al.,* 2017) rather than revolutionary (Geuens *et al.,* 2003). Ample research studies have been conducted on the evolution of retailing (for a review, see McArthur *et al.,* 2016; Theodoridis *et al.,* 2017). The most commonly accepted view on retailing evolution is Brown's work (1987), which explains this evolution based on three main theories: cyclical, conflict, and environmental. More specifically, the environmental approach explains retail evolution in terms of the external (uncontrollable) environment (i.e., competition, changes on technology, economy, demographics). Over time, all retailers must advance and strategically plan in response to changes in the uncontrollable environment as well as to consumer needs (Brown, 1987; Evans, 2011 McArthur *et al.,* 2016; Rigby, 2011). Theodoridis and Bennison (2009) point out that is crucial for retailers first to understand how complex, dynamic, or stable is the external environment, as it can entail an array of risks as well as providing opportunities for growth.

Drawing upon the concept of smartness evoking parallels with the smart city (Anttiroikko *et al.*, 2013; Chourabi *et al.,* 2012), smart economy (Anttiroikko *et al.*, 2013), smart technology (Pantano and Timmermans, 2014), smart materials (Pantano *et al.*, 2016), and so on, promising smart retail processes emerge as process heavily dependent on continual innovation and technological advancement. Thus, the environmental and conflict approaches can serve as a broad basis for explaining the evolution of smart retailing. Scholars (Brown, 1987; Brown *et al.,* 2005; Pantano, 2014; Pantano *et al.*, 2017) recognize technology as the most important driver of retailers' evolution. Although modern technology is impressive, still presents significant challenges for retailers (Evans, 2011). Inman and Nikolova (2017) assert that retail technology capabilities have never been greater; retailers are faced with an increasing array of potential technologies that is expanding in its complexity and cost.

Further, conflict theory in retailing screens change from the organizational point of view (Theodoridis *et al.,* 2017). This theory addresses the question of how a new innovation

(as in our case), retailing format or competitor affects and challenges the status quo in a given retail sector. In essence, conflict theory examines how a retailer responds to market or environmental opportunities through four phases: shock, defensive retreat, acknowledgement and adaptation (Fernie *et al.,* 2003).

Drivers of innovation in retailing

Customer needs may be seen as driving innovation processes (Bonner, 2010; Pantano, 2014; Veryzer and Borja de Mozota, 2005). Past studies (Pantano, 2016) focused on how technology push and demand pull encourage retailers to innovate as the first mover (pioneers offering first new technology and consequent innovative shopping experience) or follower (copying/imitating pioneer's strategy as reply to demand pull). Indeed, customer needs push firms and organisations to respond quickly to market requests by reducing the temporal length of the innovation cycle (including the evaluation of market trends, innovation enhancements, dissemination, research and technology transfer, definition of intellectual property and standards, funding and business development). Since successful adoption depends on organisations' capabilities to accurately respond to end-users' needs (Pantano, 2014), whose perception may vary from the way innovation providers consider the new system, the innovation may fail in meeting user needs. For instance, prior studies identified retailer failures in satisfying consumer expectations while innovating at the point of sale due to underlying differences between consumer and retailer perspectives towards expectations concerning the innovation (Backstrom and Johansson, 2006; Kourouthanassis *et al.,* 2007). While retailers focus on technologies able to reduce operational costs (i.e. personnel cost) such as the self-service ones, consumers show an increasing interest towards enjoyable experiences at the point of sale (Demirkan and Spohrer, 2014). Thus, consumers push retailers to develop integrated retail-leisure complexes, and welcome new technologies able to satisfy this request (Bakstrom, 2011; Backstrom and Johansson, 2006; Farrag *et al.,* 2010).

Moreover, traditional retail environments often discourage consumers in terms of scarcity of merchandise, insufficient floor layout design (Lee *et al.,* 2011; Li *et al.,* 2009; Noon and Mattila, 2009) and inadequate access to service encounters, in terms of time taken at service registers or waiting time for salesperson assistance. Such critical inefficiencies in current retailing may push consumers to perform the service themselves in order to reduce the delivery time (Dabholkar, 1996; Lee *et al.,* 2013). Thus, consumer participation in service (co-)creation creates a sort of synergy between the retailer (service provider) and consumers (service users) pursuing the common goal of a satisfying service.

Our argument does not imply that consumers necessarily derive positive utility from using, for example, self-service technologies (i.e. self-service cash desks for self-checkout at groceries). The logic behind co-creation is conditioned by the reduced service quality that faces consumers who use modern technology to replace personal face-to-face service or who experience a further reduction in service quality due to longer waiting times. In lieu of personal service, consumers expect to find new tools to support their search and decision-making process, to entertain them, to provide a quick response to their requests, and/or to reduce waiting time (Bolton *et al.,* 2014; Pantano and Viassone, 2015; Tsai, 2010). In turn, retailers can use these new tools to collect data on consumer search behaviour and purchase behaviour (Petiot and Dagher, 2011).

Mobile devices equipped with NFC (Near Field Communication) and ibeacons as new forms of contactless technologies, and smart mirrors based on augmented reality are emerging as promising tools in this context. For instance, augmented reality, defined as the combination of real world and virtual scenario (consisting of computer-generated information) to create a new scenario, extends the possibilities of the actual stores adding virtual elements such as images, videos, textual information, etc. to the actual store (Pantano Rese and Baier, 2017). These techniques are already finding applications in mobile retailing,

for example, a Tiffany app for virtually trying on the "perfect" engagement ring" or the Ray-Ban Virtual Try-On available for both mobile and electronic retailing to give consumers the facility to virtually try on glasses and sunglasses.

Summarizing, these tools allow consumers to easily and directly search and compare products, (virtually) taste items, access customised information, receive shopping assistance, and pay with benefits (Demirkan and Spohrer, 2014; Hagberg *et al.,* 2016; Korouthanassis *et al.,* 2007; Pantano and Priporas 2016; Pantano and Viassone, 2015; Papagiannidis *et al.,* 2014). In fact, the introduction of these new technologies at physical points of sale may solve several emerging problems in traditional retailing such as a crowded retail environment, limited opening hours, temporary non-availability of a sales assistant, and the slow speed of reply and monetary transactions (payments). For these reasons, the number of consumers shopping online (e-shopping), through mobile technology (m-shopping) or through multiple technologies (omni-channel shopping) is rapidly increasing, which in turn intensifies competition with the traditional offline channel (Dennis *et al.,* 2016; Fornari *et al.,* 2016; Picot-Coupey *et al.,* 2016). Therefore, from the consumer point of view, benefits emerging from the introduction of technology-based innovations at the point of sale include access to a wider offer, reduction of queues and waiting time, access to customised services, more efficient delivery, rewards for loyal consumers, reinforcement of trust with sellers, and more satisfying shopping experiences.

Innovation-driven retailing

In the new service economy scenario, recent technological progress makes marketing and retailing subject to discontinuous innovations, able to change the roles of both consumers and firms in creating value for the firm (Michel *et al.,* 2008). Retailers need to innovate consistently with their image and ability to develop innovation (Pantano, 2016), while

retailers with strong images that build on their ability to develop innovations should act as pioneers and need to reinforce the capability to integrate emerging innovations into their management strategies. On the other hand, retailers with a lower propensity to risk act as followers, by developing strong capabilities for identifying the best innovation for their target, and adapting and improving it into an enhanced version of a new technology, due to the high accumulated knowledge (Pantano, 2016). As a consequence of this innovation process, the role of employees as the *contact point* between the firm and final consumers, changes. Employees play a vital role in influencing a firm's innovation outcomes, consumer orientation, consumer collaboration and involvement, and progress in technology (Di Stefano *et al.,* 2012; Ordanini and Parasuraman, 2011; Pantano, 2014). In fact, employees mediate the interaction between firms and clients as they transfer the firms' knowledge (of products) to consumers, influence their choice through recommendations and adaptive selling tactics (Vasquez Caseilles *et al.,* 2005), and acquire knowledge about consumer satisfaction and needs that could be reported back to management to develop, monitor and improve new retail strategies (Andreu *et al.,* 2010). These data may trigger the introduction of advanced technologies for replying to consumer requests, thus acting as innovation drivers in retailing. From the firm's point of view, benefits emerging from innovating thus include increasing sales and profitability, reduction of costs of logistics and purchasing, more efficient management of demand (with benefits for reducing stock-outs and lost sales), improvement of client-seller relationships, increasing consumer loyalty, and acquisition of new clients. In other words, the possibility to improve the offer and access to services and products (which is supported by new interactive devices), information sharing between consumers and firms, early identification of critical issues, faster proposing solutions, increasing consumer involvement and influence their buying behaviour constitute some major potential advantages

for firms investing in innovative technology. However, these potential benefits make innovation management in retailing a complex process (Davis *et al.,* 2011; Pantano, 2014).

Examples of recently-introduced innovations include smart mirrors to support the virtual try-on of clothes in fitting rooms (e.g. the Tommy Hilfiger brand introduced smart mirrors to enhance the fitting rooms in a few selected stores), informative touch screen displays in large department stores and shopping centers for identifying and searching items in the stores (i.e. Ikea and Mediamarkt introduced these systems in all their points of sale in Europe), and interactive storefront windows that allow consumers to visualise and buy items anytime without physically entering in store (e.g. the Sunday project in some Kate Spade stores). Moreover, advances in ubiquitous technologies, electronics miniaturization, and automation provide new systems that can be used for self-services (Campbell *et al.,* 2011).

The new trend is to merge emerging retail channels to enhance the quality of service. The M&S e-boutique, is an example, recently available in many stores around Europe, where touch-screen displays allow consumers to find and select favorite products, access more information on items and pay by credit card (the system supports pin). In this way, the system proposes a larger product range than actually available in the physical store. Therefore, the context is highly dynamic and subject both to changing consumer needs and technological offers, forcing retailers to work under conditions of high levels of uncertainty. Hence, technology pushes retailers to manage a portfolio of a wide range of innovations by taking into account that few of them would be radical breakthroughs (Pantano, 2014). While technologies such as location-based services, touch-screen displays and automatic cash-desks offer an additional service to those traditionally provided, a new generation of systems, based on ubiquitous computing, artificial intelligence, cloud computing, and so on requires new organisational competences and capabilities, since they might represent discontinuity in standardised management practices. Thus, the emerging generation of new technology

replaces old practices. Although for managing the innovation process firms usually deploy some experienced practices, the novel discontinuous surroundings leave the traditional routines scarcely effective (Aloini *et al.,* 2013; Bessant *et al.,* 2010). For these reasons, innovation strategies tend to require the development of ad-hoc strategies for managing organisational, technological, market and environmental change.

Smart retailing versus traditional technology management approaches

Traditional innovation management approaches in retailing have mainly focused on different ways of introducing technology-based innovations to increase consumer acceptance and business profitability (Dabholkar, 1996; Hagberg *et al.,* 2016; Pantano, 2014; Demirkan and Spohrer, 2014; Papagiannidis et al., 2014), while only a limited number of works considered the idea of smart technology for enhancing retailing (Leitner and Grechenig, 2009; Pantano and Viassone, 2015; Priporas *et al.,* 2017). Since the idea of smartness goes beyond the idea of intelligent application of new technologies by including more essential dimensions such as the organisational processes and selling activities (Pantano and Timmermans, 2014), the smart usage of technology can be easily extended to the retail process for the purpose of making it "smarter". Concerning the organisational process, smart technologies affect the methods of collecting data from consumers, managing information, transferring knowledge from firms to consumers and *vice versa* (Leitner and Grechenig, 2009; Wood and Reynolds, 2013), while (i) creating a sort of partnership with clients, who become active actors working in cooperation with retailers under the common goal of producing a more satisfying service, and (ii) pushing retailers to develop new capabilities for actively responding to changeable markets and successfully managing innovation (Kindstrom *et al.,* 2013; Lin and Hong, 2008).

Concerning selling activities, smart technologies are able to change the way in which consumers access and consume services and products, as well as the building and

maintenance of relationships with sellers. Through smart technologies, consumers can access products and services from almost anywhere (through a system equipped with an Internet connection), or buy the product before effective consumption (i.e. buying in the store and delivery at home, buying outside (while standing in city parks, squares, travelling via trains, waiting at the bus stops, etc.) and delivery at home, buying at home and delivery in the store, etc.), by separating the moment of purchase and effective consumption (Xie and Shugan, 2001), without the direct assistance of a salesperson. For instance, the increasing use of ubiquitous computing that involves an increasing level of connectivity (Wu and Hisa, 2008; Anttiroiko *et al.,* 2013) ensures that consumers will always be connected (anytime and anywhere), and thus are available for shopping. On the one hand, retailers may exploit this ubiquitous access to collect data on consumers in real-time and predict future trends with a higher level of detail (Campbell *et al.,* 2011; Lin and Hong, 2008). On the other hand, greater connectivity allows consumers to have customised access to information, select only products and services matching their needs, and thus avoid any problem related to the excess of information (Pantano, 2014). Furthermore, these systems allow both consumers and retailers to easily communicate with each other, share comments on products and services, and collaborate in the creation of the service (highly facilitated by self-service systems) (Teixeira *et al.,* 2012; Veryzer and Borja de Mozota, 2005). As a consequence, these systems also affect the way consumers interact with sellers and retailers (Gustafsson *et al.,* 2012; Ko and Kincade, 2007; Leitner and Gretchenig, 2009; Wood and Reynolds, 2013). Their requests might be submitted directly through these technologies, which mediate all interactions (Pantano, 2014). Moreover, this integration of smart technologies might play an even bigger role at the strategic level, by facilitating access to real-time data on single-consumer behavior, generating big data. The successful exploitation of big data is further considered to be one of the key elements for the future competitive advantage (Harvard Business Review,

2017). However, only few companies are actually investing in smart technologies to manage big data and adapting their strategies accordingly. A meaningful example is Ocado (one of the largest online grocery retailers) who started a partnership with Google to use its cloud platforms (e.g. App Engine, BigQuery, Cloud Storage, etc.), which allows Ocado to access big data online stored in a particular warehouse provided by Google. This system enbles Ocado to handle more transactions and analysis than the company would be able to manage alone, and create new instances to fit the specific consumers' requirements without the expense and difficulty of building an ad hoc data center for each new consumer.

Summarizing, smart technology for retailing implies the development of (novel) ad-hoc capabilities, new (consumer) access to services, changes in knowledge management, the creation of smart partnerships, and new ways of consuming products and services. The benefits emerging from smart retailing are (i) greater availability of products, services, and information (e.g. the use of an app for locating products in the physical stores allow retailers to collect data on consumers' behaviour within the store in terms of searched products); (ii) knowledge sharing between firms and consumers (such technologies as a mobile app that allows firms to create and submit personalised offer for each consumer); and (iii) smart partnerships among retailers, sellers (e.g. frontline employees), and consumers through the building of smart partnerships (which overcomes difficulties inherent in traditional vendor-client relationships) (Figure 1).

[Figure 1 Here]

Conceptual framework

Having defined the concept of smart retailing, we continue discussing a comprehensive set of factors that dictate the success of smart retailing. As anticipated, the core elements are based

on the greater availability of products, information sharing among involved actors and their emerging (smart) cooperation. Beyond this core, other key elements contribute to create the smart retailing framework. Similarly to smart services (Chourabi et al., 2012), these elements are: (i) organisation, (ii) economy, (iii) people, (iv) technology, and (v) market structure, which also have a reciprocal influence (Figure 2).

[Figure 2 Here]

Only few studies have addressed smart retailing and innovation management in retailing from a managerial and organisational perspective (Campbell *et al.,* 2011; Leitner and Grechening, 2009). Current literature mainly investigates emergent technologies for retailing (Dobholkar, 1996; Kourouthanassis *et al.,* 2007; Demirkan and Spohrer, 2014, Papagiannidis *et al.,* 2014).

he "organisation" includes the (i) people who will decide to introduce the technology, therefore their attitude towards innovativeness or their resistance towards the change, (ii) alignment of the technology benefits with organisational goals and objectives, internal and external resources to innovate (i.e. financial and human resources), (iii) the organisation's ability to reply to changes and related capabilities including the dynamic capabilities and technology absorptive capacity (ability to recognise the value of a certain technological innovation), (iv) ability to successfully integrate it within the organisation strategy) (Andersson *et al.,* 2001; Kindstrom *et al.,* 2013; Seebode *et al.,* 2012; Teece *et al.,* 1997; Wang *et al.,* 2007), and (v) the organisation's culture and orientation (e.g. market orientation). These features might support or refute the smart approach, by pushing an organisation to adopt either a traditional, more standardised approach, or alternatively to dramatically redefine their new strategies for achieving competitive advantages.

The second element is "economy", including financial sustainability and economic (external) environment that might be a driver of smart retailing. The smart retailing approach is designed to improve an organisation's actions and business development, and thus promote job creation and workforce development as part of the more general concept of smart cities, supported by many local governments aiming to improve cities (i.e. smart cities projects) (Anttiroiko *et al.,* 2013; Chourabi *et al.,* 2012). To this end, every year the European Commission finances smart initiatives to translate digital technologies "into better public services for citizens, better use of resources and less impact on the environment" (see the Digital Agenda for Europe – Europe 2020 Initiative).

The third element is "people", which concerns the actors involved in a smart retailing environment: both consumers and retailers (including managers and employees). On one hand, the emerging scenario has an impact on the quality of consumers' shopping experiences; consumers are more informed, more experienced with technology, as in the case of Generation Z (Priporas *et al.,* 2017), and issues such as mobility disabilities can be supported (Dennis *et al.,* 2016). On the other hand, smart retailing impacts the quality of work for retailers and employees, who can use the system for building knowledge of consumers, transfer product knowledge to consumers, and exploit product knowledge to support their tasks. The new approach gives consumers and retailers notionally equivalent roles and importance in the process, by considering them as actors in the (new) participatory retail process, which needs both consumers' and retailers' contributions for creating/delivering the final service. Hence, consumers and retailers are engaged in smart-partnerships.

The fourth element comprises the "technology". As retailing has become more technologically dependent and competitive (Fiorito *et al.,* 2010), it is imperative for retailers to invest in the appropriate technologies leading to the zero moment of truth in the purchase

decision-making activity (Hall and Towers, 2017).The smart retailing approach relies on the smart usage of innovative technologies that are integrated into the retail process. These technologies are sophisticated systems, with integrated software, hardware and network technologies equipped with real-time context-awareness and with advanced analytics able to support people to make "smart decisions" about shopping (Kwon and Sadeh, 2004; Lee *et al.,* 2015), while helping retailers to collect data on consumers and predict market trends, reduce management costs (some tasks are shifted from humans to technology), manage knowledge on products and consumers, and influence consumers' buying decisions (Demirkan and Spohrer, 2014; Pantano, 2014). Therefore, smart retailing is strongly related to advances in technology, technology availability (which includes the offer of a technology able to satisfy companies' needs at an affordable cost), risk of technology becoming out-of-date and out-of-use (Pantano *et al.,* 2013).

The last key element concerns the "market structure". In the smart retail environment, market structure can be indicated by the number of competitors performing in the same sector (e.g. number of grocery retailers), as well as by the speed of innovation of main competitors. As suggested by Hackl and colleagues (2014), considering the number of actors (competitors) and product life-cycle is fundamental for understanding the market structure of a new competitive environment. Therefore, the market structure is based on the smart technology diffusion and number of competitors, which push retailers to adopt certain strategies. On the one hand, the market structure is characterised by the number of competitors that already (successfully) adopted a certain innovation, on the other hand by the speed of diffusion of this innovation among competitors.

Risks assessment and economic sustainability

Although introducing innovation produces several benefits for retailers, the process also

encounters several risks that should be taken into account. For instance, smart retailing is complex and difficult to evaluate accurately (Alkemande and Suurs, 2012; Wang *et al.,* 2008). Innovation requires monetary investments, the development of new management strategies, the possibility of late or no returns on investment, and even the adoption of new systems that make the previous ones obsolete (Pantano *et al.,* 2013). Hence, this process requires specific competencies for selecting the best and most sustainable innovation and innovation strategy.

A few tools have been suggested in the literature to support retailers in limiting risks. For instance, the Risk Breakdown Structure (RBS), a framework for clearly identifying all potential sources of risk, starting from a root node representing a generic risk and splitting into layers of increasing detail (Hillson, 2002; Pantano *et al.,* 2013), while a probability-impact grid might be employed for estimating risk by rating the value according to the probability of occurrence and the impact of the consequent effects (Ward, 1999). Similarly, retailers may use other established methods that have been successfully applied to other organisation processes (i.e. manufacturing and production) for supporting the choice of the technology and reducing the involved risk, such as the Multi-Attribute Decision Making Model (MADM) (Amin *et al.,* 2006; Amin and Emrouznejad, 2013; Khouja, 1995), Analytic Hierarchical Process (AHP) (Hsu *et al.,* 2010; Shen *et al.,* 2010), and the Analytic Network Process (ANP) (Ordoobadi, 2012).

Due to the importance of the technology life-cycle and consumers' acceptance and usage of retailers' innovations, the encountered risks may be summarised into two main categories: risk of (i) *out-of-date*, and (ii) *out-of-use* (Pantano *et al.,* 2013). *Out-of-date* concerns the risk of obsolescence of the internal technical components of the technology, each of which may have a substantial knock-on effect on the whole system. For instance, some input devices such as special joysticks may soon be substituted by other devices based

on cameras that do not require users handling of physical objects, which are further characterised by context-awareness. In particular, these technologies contribute to the smart retailing approach. Also the internal software may be subject to obsolescence and substitution by newer versions (such as systems based on advanced 3D graphics, etc.). Hence, while estimating the possible risks, it is essential to evaluate in advance the innovation life-cycle curves, time for being out-of-date of each component, and the related effect on the whole system. Retailers must consider that the life-cycle of the whole technological innovation needs to be longer than the break-even time for return on investment for achieving profitability.

Out-of-use has been largely measured through the evaluation of consumer's acceptance of the technology, utilizing the Technology Acceptance Model (TAM) (Davis, 1989) and its extended versions. The model predicts users' effective usage of a certain technology, focusing on particular determinants such as ease of use, usefulness, attitude and behavioural intention. Extensions to TAM may also include more constructs such as perceived enjoyment, trust in the technology (a psychological state of positive expectation towards the usage of the technology) and social influences (influences by reference groups like family, colleagues, partners, and so on).

For these reasons, retailers are subject to two opposing forces while innovating: the demand of innovating/innovation benefits and the possible risks of losing the investment in innovation. To maximize the benefits and reduce – or even remove – the threats, the choice of the best technology to be adopted among the available systems, retailers need further tools able to compare benefits and costs of each alternative. The growing pressure driven by continuous innovations pushes retailers also to question to what extent innovating will be financially sustainable. The broader concept of financial sustainability starts from the purpose

of maintaining current business levels and going further by achieving growth and development of future business profitability (Pham and Thomas, 2012).

While innovating, firms need to develop new capacity for handling new technologies, new markets, new environmental conditions, etc.; and they need to develop dynamic capability to absorb and exploit new knowledge and integrate into the organisational processes (Seebode *et al.,* 2012). Hence, innovating still remains a complex process for retailing requiring further investigations from a strategic management perspective.

Future shopping scenario within the smart retailing perspective

Traditional shopping allows only the face-to-face interaction between consumers and retailers while shopping in the (physical) point of sale. Thus, access is related to consumers' physical access to the point of sale, while information sharing and collaboration between consumers and retailers is achieved through informal communication during the in-store experience. The increasing access and connectivity supported by the technologies allows users to access products without physical presence in the point of sale, directly from desktop computers or mobile devices equipped with Internet connections. Smart retailing provides a 24/7 service, while retailers can collect data by tracking consumers' behaviour while using the specific technology. Similarly, smart retailing promotes information sharing and collaboration, by providing advanced tools for cooperating within the point of sale. Hence, the new technology-enriched store emerges as a smart distributed space where consumers can co-create the final service and shopping anytime and anywhere. In fact, the new scenario is based on the extensive usage of smart technologies, ubiquitous access to information/service/product and high interactive platforms. Figure 3 summarises the new smart retail model, by emphasizing the shift from traditional retailing to the smart one, characterised by the (i) increasing access and connectivity, and (ii) increasing information

sharing and collaboration (partnership), towards the smart usage of technologies for collecting real time data on every single consumer behavior and preference (big data analytics).

[Figure 3 Here]

Furthermore, our model demonstrates the importance of information for the current competitive retail scenario. In fact, smart technologies make available a much greater amount of information for supporting both retailers (i.e. information on market trends) and consumers (i.e. information on products able to better fit own preferences), which can be freely shared among consumers or between consumer and firm in order to create a smart partnership where consumers participate in the service delivery. As a consequence, in the future competitive scenario, retailers' roles will decrease with the growth of technology efficiency in retail settings.

Summarizing, in the traditional retail scenario, shopping is limited to store opening times and physical constraints, while the increasing connectivity allows consumers to shop from home or from a mobile device equipped with internet connection 24/7, and the increasing information sharing and collaboration provides consumers with tools for co-creating the final services (most of them based on self-service technologies such as automatic cash-desks, informative touch screen displays, etc.) within the physical store. The use of such tools simultaneously increases both access and connectivity, and information sharing and collaboration create a new retail scenario not limited to the physical boundaries of the point of sale (in terms of size and opening times) or to the direct salesperson assistance, able to enlarge the offer and enrich the service. Similarly, there is an increasing diffusion of people adopting more channels for shopping, such as the physical store for "touching" the products, to the online scenario for buying (which allows saving time and often saving money). Hence,

the trend is to shift from shopping within traditional stores to shopping within smart environments, such the one offered by ubiquitous technologies for shopping. Finally, smart retailing emerges as a new concept of retailing mediated by technology, and characterised by both an extensive and frequent consumers' access to information through advanced systems and consumers' information sharing in order to create a partnership with retail service providers.

Calls to Action

Due to the numerous intersections among different areas of the research that ranges from computer science to marketing to social science, we propose lines for future inquiries. These suggestions point to a promising research agenda related to the adoption of smart technologies within the emergent smart retail scenario (Table 1): search, selection, implementation, and adoption strategy.

(i) Search

Investigation of how retailers should search the technology that best fits their need is a new topic in the current literature. Past studies from innovation science focused on the design of new systems and service platforms for supporting retailing (Demirkan and Spohrer, 2014; Kourouthanassis *et al.,* 2007; Leitner and Grechenig, 2009; Sha *et al.,* 2013), while companies adopted different technologies such augmented reality techniques, mobile app, smart mirrors, etc. Since retail is a sector more oriented to introducing innovation developed by other industries (Pantano, 2014), retailers would need some frameworks to support the technology search phase, in order to easily find the technology to fit their requests. Thus, the challenge relates to the identification of the available technology, which is related to the choice between introducing an existing technology and developing a totally new one.

(ii) *Selection*

Due to the increasing availability of advanced technologies, selecting the technology able to fit simultaneously both consumers' and retailers' needs within the constraint of economic sustainability is still an open challenge. In fact, past studies identify tools for selecting the best technology in sectors such as manufacturing and service but have neglected to address the retail sector (Campbell *et al.,* 2011; Davis *et al.,* 2011; Maglio and Spohrer, 2013; Pantano, 2014), thus the challenge relates to the definition of selection criteria able to select the best technology able to meet retailers needs with a given effort that includes the exploitation/integration/reengineering of current human, financial and actual technological capabilities.

(iii) *Implementation*

The technology identified during the previous steps would require further adjustments for matching both market and retailers' needs at the same time, which could require a reassignment of current organisational resources. In fact, smart retail technology should be attractive for all potential users (retailers, employees, consumers, etc.) (Priporas et al., 2017), while firms showed the need for adequate information technology resources to increase the efficiency (Yadav and Pavlou, 2014). Hence, the further challenge is how to implement the technology for all users, without requiring additional resources.

(iv) *Adoption strategy*

Current research mainly focuses on technology adoption from a consumers' perspective (Kourouthanassis *et al.,* 2007; Papagiannidis *et al.,* 2014; Reese *et al.,* 2014; Tsai 2010), while a successful strategy would require also a focus on the technology life-cycle and risk assessment. The risks of out-of-use and out-of-date of a technology should be jointly investigated, as well as the impact on the organisation. Hence, the successful strategy will take into account the timing, the out-of-date and out-of-use risks, the means of attracting potential users (both from firms and market), the involvement required and the extent to

which these are to be exploited, the effects on the organisation and on the actual business model which would be adapted to the new retail approach.

[Table 1 Here]

Conclusions

Although literature provides evidence on the extent to which involving consumers in service development with emphasis on the consumer co-creation experience (Davis *et al.,* 2011; Gustafsson *et al.,* 2012; Heinonen *et al.,* 2013; Karpen *et al.,* 2012; Ngo and O'Cass, 2013; Teixera *et al.,* 2012; Vargo and Lusch, 2004; Veryzer and Borja de Mozota, 2005), in retailing this view is currently under-investigated. In fact, the current focus in retail services is on the possibility of improving the process with advanced technological innovations (Demirkan and Spohrer, 2014; Kourouthanassis *et al.,* 2007; Leitner and Grechenig, 2009; Pantano, 2014). Our study provides new perspectives in retail by defining a comprehensive model of smart retailing that can be used to improve retail service.

Smart retailing is emerging as an important element within the notion of smart services and smart cities (Anttiroiko *et al.,* 2013; Chourabi *et al.,* 2012; Pantano, 2014). We identified the starting point of a smart technology for (smart) retailing, the emerging benefits, and the success factors. New trends in technology provide opportunities for developing sophisticated services and applications and integrative platforms for supporting retailing and moving towards a future-oriented concept of "smart retailing". The progress in technology demonstrates increasing possibilities for access to information/service and connectivity towards the ubiquitous access anywhere/anytime supported by ubiquitous computing, as well as information sharing and collaboration among users (Demirkan and Spohre, 2014; Dennis *et al.,* 2016; Pantano, 2014).

The implications of this paper are several. First, it extends the growing body of research on innovation in retailing (Demirkan and Spohrer, 2014; Pantano, 2014; Hagberg *et al.,* 2016; Pantano et al., 2017), and smart retailing (Kim *et al.,* 2017; Pantano and Timmermans, 2014; Priporas *et al.,* 2017; Roy *et al.,* 2017; Vrontis *et al.,* 2017), by offering a clear framework that describes the extent to which retailing can be improved through the systematically use of smart technologies, employed to support several aspects of the process. Similarly, practitioners can use this framework to evaluate if their actual retail strategies are "smart enough" and improve them accordingly, while the framework emphasizes the key role played by the choice of the right technology able to reply to actual "call to action".

Secondly, it contributes to Retail Change Theory by confirming how retail processes are evolving prompted by external uncontrollable factors such as the changes in technology, in economy, in consumers' behaviors, and so on (Brown, 1987; Evans, 2011; McArthur *et al.,* 2016; Rigby, 2011), by providing the smart retailing framework as an aid to strategically planning the response to this environment. More specifically, the paper provides a clear understanding of the actual environment where retailers compete as complex and dynamic, which is fundamental for retailers for achieving opportunities, as anticipated by the work of Theodoridis and Bennison (2009).

This research has also educational implications. Indeed, the proposed new framework in retailing will help marketing and retail students to understand the actual competitive scenario through a smart lens (smart retailing framework), which in turn will help them to make sense of their own learning, personal development, and practice in retailing education and marketing programmes/courses in general. The framework expands the knowledge and skills of students to respond to new technological developments and changing environment, and thus it can support the practice that good learning can further lead to good employability (Anderson and Lees, 2017).

Although current research in retailing is moving towards a "smarter" scenario, there is still a lack of knowledge of how technology-based innovations change traditional retail business models and to what extent these should be integrated within the organisation to achieve business profitability. Previous studies called for new research to contribute knowledge and develop new theories on marketing evolution (Yadav 2010; Yadav and Pavlou, 2014). Answering these calls, our study provides a new framework synthetizing factors affecting the retail scenario. Moreover, new research focusing on the emerging concept of smart retailing should lead to the development of an objective measurement scale for evaluating the effects of smart retailing on consumers' lives, the effects on the broader concept of smart cities, and economic sustainability within the smart cities approach.

Retailers might use this approach to revise their business models, and consider the integration of smart technologies for providing superior services. This model supports retailers in better understanding the competitive scenario and reacting accordingly, by reconfiguring and assigning their internal and external resources. The present study also has some ripple effect for scholars, in "pushing" researchers in retailing to improve their current approach to marketing by including also aspects related to innovation and technology management. In other words, it solicits new contributions to the disciplines by moving from a perspective considering retailing as a stand-alone unit, to new context where the retail industry is continuously influenced by advancements in technologies and innovation-driven sectors, towards a new perspective in retailing: innovation-driven retailing. This new perspective can offer a step for overcoming the "myopia" which exists both in academia and industry. As Sheth and Sisodia (2005, p. 10) point out in their essay that is included in a collection of short essays (Brown *et al.,* 2015) in the Journal of Marketing point out, "It could be argued that marketing academics and practitioners alike are suffering from "marketer myopia"; that is, they are so focused on what they do that they fail to notice significant

changes in the environment around them". This paper accordingly responds to changes in the technological and consumer environments by proposing a new comprehensive model that can be used to improve retail service.

As this current paper is conceptual in nature, ongoing empirical research is indicated to broaden the field of contemporary retailing. For example, the suggested framework could be empirically tested in different retailing subsectors (e.g. grocery, luxury, etc.) and formats for comparison purposes. Also, other researchers could add some other factors that can play an important role in expanding the suggested framework and in the conceptualization of similar frameworks.

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Table I. Key innovation management challenges

| Innovation activity	Challenges
Search	How to find the best (available) technology?
Selection	How to select the best technology for both retailers and consumers among the available ones? How to develop the best selection criteria for supporting the choice?
Implementation	How to adjust the technology according to the organisation, by excluding the need of employing external resources?
Adoption strategy	How to introduce the technology, in term of time, users' approaching (both consumers and employees), integration with the current organisation resources and the subsequent effect on organisation and business model?
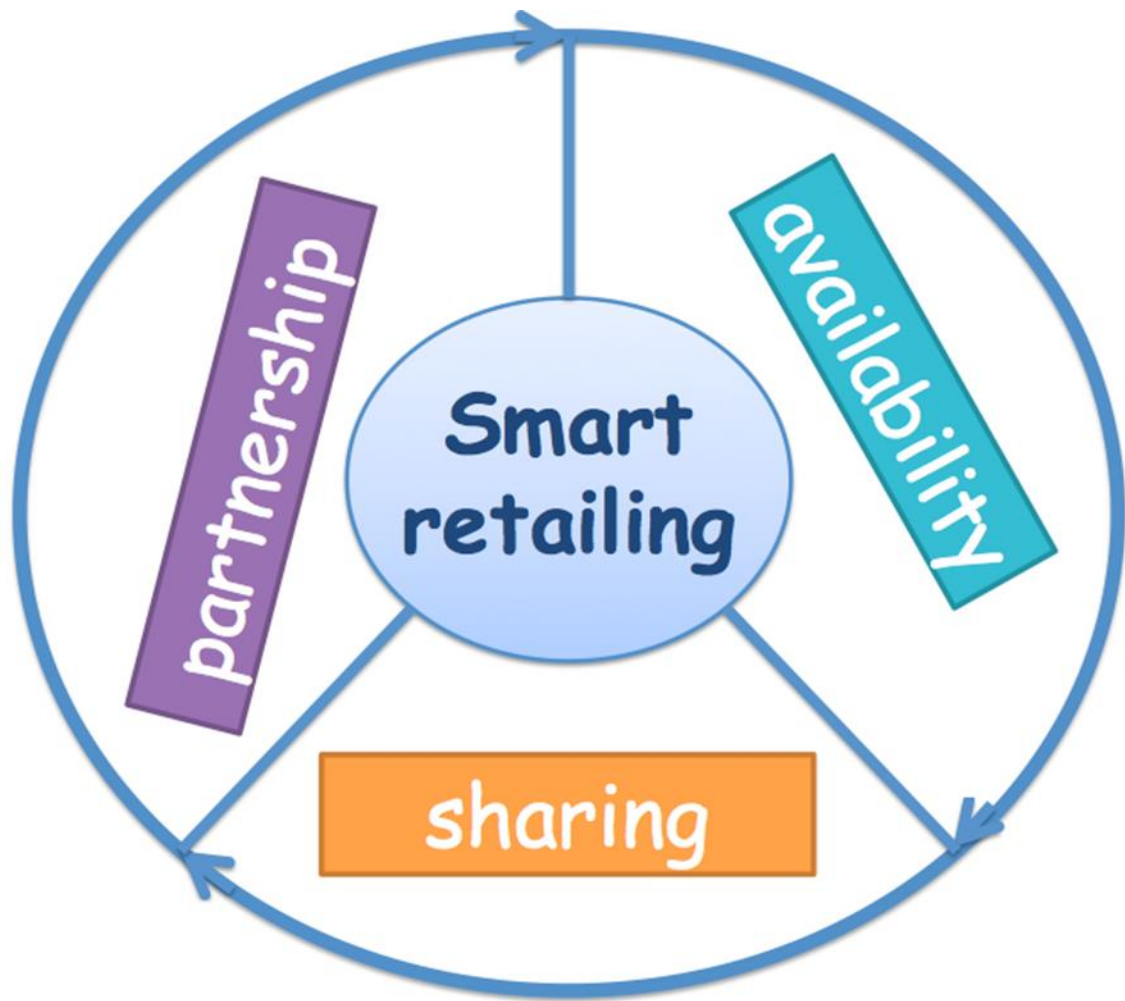
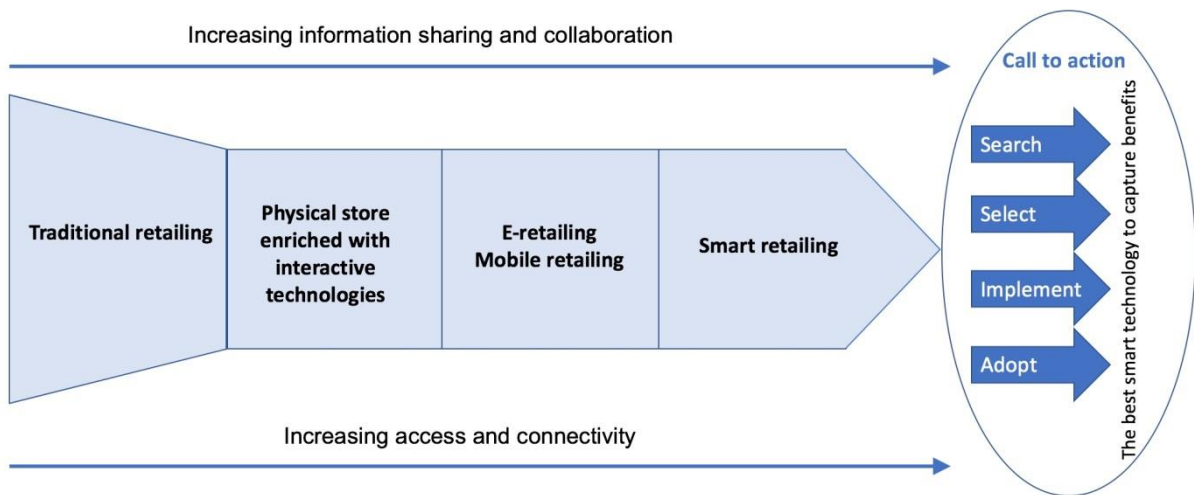Figure 1: Key blocks of smart retailing concept.
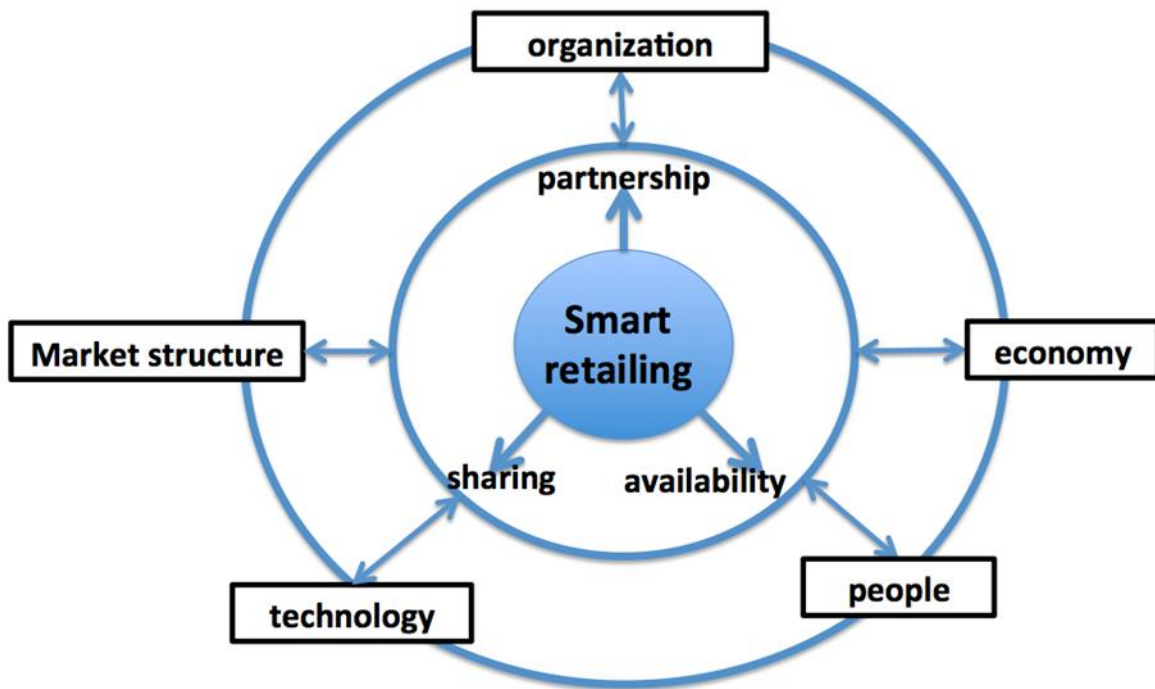
Figure 2: Smart retailing framework

Figure 3: Future shopping scenario within the smart retailing perspective.