



# GAZİANTEP UNIVERSITY JOURNAL OF SOCIAL SCIENCES

Journal homepage: <http://dergipark.org.tr/tr/pub/jss>



## Araştırma Makalesi • Research Article

### Smart Shopping Experience of Customers Using Mobile Applications: A Field Research in Karabük/Turkey

*Mobil Uygulama Kullanıcısı Müşterilerin Akıllı Alışveriş Deneyimleri: Karabük İlinde Yapılan Bir Alan Araştırması*

Kasım YILMAZ<sup>a</sup>, Volkan TEMİZKAN<sup>b\*</sup>

<sup>a</sup>Dr. Öğr. Üyesi, Karabük Üniversitesi, TOBB Teknik Bilimler MYO, Karabük / TÜRKİYE  
ORCID: 0000-0002-4544-4727

<sup>b</sup>Dr. Öğr. Üyesi, Karabük Üniversitesi, Sosyal Bilimler MYO, Karabük / TÜRKİYE  
ORCID: 0000-0002-1162-7912

#### MAKALE BİLGİSİ

##### Makale Geçmişi:

Başvuru tarihi: 1 Aralık 2019

Kabul tarihi: 11 Temmuz 2020

##### Anahtar Kelimeler:

Akıllı Alışveriş Deneyimi,  
Akıllı Alışveriş Teknolojisi,  
Mobil Alışveriş Uygulamaları,  
Mobil Müşteri Tatmini

#### ARTICLE INFO

##### Article History:

Received December 01, 2019

Accepted July 11, 2020

##### Keywords:

Smart Shopping Experience,  
Smart Retailing Technology,  
Mobile Shopping Applications,  
Mobile Customer Satisfaction

#### ÖZ

Günümüzde akıllı alışveriş teknolojilerini kullanan mağazalar giderek çoğalmakta ve gelişmekte bu teknolojilerle ortaya çıkan yeni eğilimler müşteri davranışlarını etkilemektedir. Müşteriler artık akıllı alışveriş teknolojilerini kullanmaya elverişli mobil uygulamaları kullanarak daha fazla akıllı alışveriş deneyimi yaşamaktadırlar. Bu araştırmanın amacı, alışverişlerinde mobil uygulamaları kullanan müşterilerin yaşadıkları akıllı alışveriş deneyimlerinin müşteri tatmini ve alışveriş verimliliği üzerindeki etkisini incelemektir.

Toplamda 310 adet anketin analiz edildiği bu çalışmada yüzyüze anket metodu uygulanmıştır. Yapısal model açıklayıcı ve doğrulayıcı faktör analizleriyle test edilmiştir. Yapılan analizler sonucu mobil uygulamaları kullanarak akıllı alışveriş deneyimi yaşayan müşterilerin tatmin seviyesinin yüksek olduğu anlaşılmıştır. Ayrıca akıllı alışveriş deneyimi alışveriş verimliliğini güçlü bir düzeyde etkilemektedir.

#### ABSTRACT

Today, stores equipped with smart retailing technologies (SRT) are evolving and new trends affect consumer behaviors. Customers more frequently have smart shopping experiences (SSE) using mobile applications which offers smart retailing technologies. The main purpose of this study is to analyze the effects of smart shopping experience of customers using mobile apps, on customer satisfaction and shopping productivity.

In this study face to face survey method was used where a total of 310 questionnaires were obtained and analyzed. Structural model was tested by using explanatory and confirmatory factor analysis. Analysis shows consumers are satisfied using mobile shopping applications in the context of smart shopping experience (SSE). Also SSE strongly affects shopping productivity.

\* Sorumlu yazar/Corresponding author.  
e-posta: [vtemizkan@karabuk.edu.tr](mailto:vtemizkan@karabuk.edu.tr)

## GENİŞLETİLMİŞ ÖZET

İnternet teknolojisindeki hızlı gelişmeler diğer sektörleri olduğu gibi perakendecilik sektörünü de etkilemekte ve dönüştürmektedir. Bu dönüşümü erken fark eden işletmeler, akıllı perakendecilik teknolojilerini kullanarak rekabet kabiliyetlerini korumayı ve arttırmayı hedeflemektedirler. Bu bağlamda, bir teknoloji, internete bağlanabilen ve etkileşimli olarak kullanılabilen bir elektronik cihaz veya sistem olduğunda 'akıllı' olarak adlandırılır. Radyo Frekanslı Tanımlama Sistemi (RFID), Yakın Alan İletişimi (NFC), Arttırılmış Gerçeklik (AR), kare kod, bulut bilişim, ısı haritası kameraları, sensörler, beaconlar, akıllı etiketler, sanal cüzdanlar, akıllı alışveriş sepeti ve alışveriş asistanı uygulamaları perakendecilik sektöründe yeni teknolojik eğilimler olarak dikkat çekmektedir. Akıllı perakendecilik, perakendecilikte kablosuz teknolojiyle birbirleriyle iletişime geçebilen akıllı cihazların kullanımınıdır. Akıllı perakende teknolojisi, akıllı nesnelere ve cihazlardan oluşan bir ağ üzerinden tüketicilere perakende hizmetler sunan etkileşimli bir perakende sistemidir. Birbirine bağlı olan bu cihazlar çevreyi algılayarak gerçek zamanlı veri toplama, iletişim, etkileşim ve geri bildirimde bulunabilir. Böylece akıllı perakende teknolojileri (SRT), müşterinin ihtiyaçlarına göre tasarlanmış benzersiz bir alışveriş deneyimi yaratarak fiziksel ve dijital dünyayı entegre etmektedir. SRT'nin uygulanması perakendeciler için daha düşük işgücü maliyetleri, artan verimlilik, kolaylık ve erişilebilirlik sağlarken müşteriler için ise daha fazla etkileşim (kişiselleştirilmiş promosyon teklifleri) sağlaması beklenmektedir.

İnternet teknolojisinin hızla yayılması perakende sektörünü ve müşteri alışveriş deneyimini önemli ölçüde değiştirmiştir. Dijitalleşme geleneksel perakendecileri, değişen tüketici ihtiyaçlarına cevap verebilmek için iş süreçlerini bu teknolojilere adapte etmek zorunda bırakmıştır. Dijitalleşme artık rekabetin ön koşulu olmuştur. Endüstri 4.0 ve 4.5 G ile birlikte "akıllı" olmak işletmeler için kaçınılmaz bir dijital dönüşümü gerektirmektedir. Bu dijital dönüşüm içinde ölçmeye dayalı olarak; dinamik fiyatlandırma, mağaza içi analiz sistemleri, stok yönetimi, anlık ürün ve ödeme sistemleri otomasyonları gibi teknolojilerde yer almaktadır.

Mobil internet teknolojilerinin gelişmesiyle birlikte akıllı cep telefonları akıllı perakendecilik uygulamalarının merkezinde yer almayı başarmışlardır. Mobil kullanıcılar, çevrimiçi olarak yer ve zaman kısıtlaması olmaksızın alışverişlerini gerçekleştirme imkanına sahiptirler. Perakendecilik sektöründe e-ticaretin payı, e-ticaret içerisinde de mobil cihazlar yoluyla yapılan m-ticaretin payı giderek artmaktadır. Mobil teknolojiler, alışkanlıkları ve davranışları hızla değiştirebilmektedir. Bu nedenle satıcılar, müşterilerine daha tatmin edici alışveriş deneyimleri yaşatabilmeleri için mobil tüketici davranışlarını iyi okumalıdır. Böylece tüketicinin sürekli elinde olan cep telefonları ile etkileşime geçmeyi başaran akıllı perakendecilik teknolojileri müşteri/satıcı ilişkilerini yeni bir safhaya taşımaktadır. Bu durum satıcıları yeni teknolojileri araştırmaya ve buna uygun stratejiler geliştirmeye yöneltmiştir. Akıllı perakendecilik teknolojileri bir yandan esneklik sağlarken diğer yandan da gerçek zamanlı bir iletişimi mümkün kılmaktadır. Yine akıllı teknolojiler perakendecilere, mağaza çalışma saatleri, yerleri ve büyüklükleriyle ilgili sınırlılıklar konusunda da yeni kabiliyetler kazandırabilmektedirler. Akıllı telefonlar müşterilerin sanal ve fiziki dünyalarını birleştiren olağanüstü cihazlardır. Günümüzde iyi tasarlanmış mobil uygulamalar perakendecilikte büyük öneme sahiptir. Satıcılar tarafından tasarlanan mobil uygulamalar, müşterilerle satıcılar arasında karşılıklı olarak memnuniyeti sağlamaya yönelik akıllı bir iş birliği platformu niteliğindedir. Mobil alışveriş uygulamaları sayesinde ürün bilgisi, fiyat mukayesesi, stok durumu, kullanıcı yorumları ve sosyal medya mesajlarına kolaylıkla erişim sağlanmaktadır. Müşteriler bilgi edinme açısından eskiye nazaran satıcılar karşısında daha avantajlı durumdadırlar. Mobil cihazlar zaman ve yer kısıtlaması olmaksızın müşterilere kendilerine özel tekliflerden haberdar olma imkanı sağlamaktadırlar.

Akıllı alışveriş deneyimi, müşterinin akıllı perakendecilik teknolojilerini kullanarak gerçekleştirdiği alışveriş süreciyle ilgili olarak sahip olduğu bilgi ve algıdır. Müşterilerin alışveriş deneyimlerinden memnun olmaları satın aldıkları ürün veya hizmetlerin de değerini arttırmaktadır. Akıllı teknolojiler sayesinde satıcı-müşteri ilişkileri daha interaktif özellikler taşımaktadır. Satıcılar bu teknolojiler sayesinde gelişmiş bir müşteri veri tabanına sahip olabilmekte ve hedef gruplarını daha iyi anlayabilmektedirler. Müşteriler ise ürün ve hizmetler konusunda daha fazla bilgi edinerek daha rasyonel ve verimli alışveriş deneyimi yaşayabilmektedirler.

Araştırma üç parametre üzerine inşa edilmiştir. Birincisi hızlı bir şekilde gelişen ve değişen mobil teknolojiler, ikincisi bu teknolojileri takip ederek uygulayan satıcılar ve son olarak kendilerine sağlanan teknolojileri kullanma eğilimi giderek artan müşterilerdir. Her sektörde olduğu gibi rekabet, perakendecileri teknolojik eğilimleri ve bu eğilimlerin müşteri davranışlarını nasıl etkilediğini dikkatle izlemeye zorlamaktadır. Akıllı alışverişin temel amacı, müşterinin dijital ve fiziki dünyasının birleştirilmesidir. Bu çalışmada akıllı alışveriş, müşterinin mobil telefonu vasıtasıyla satın alma sürecini gerçekleştirdiği işlem olarak kabul edilmiştir. Bu deneyim sadece farklı cihazlar arası bir etkileşimi değil aynı zamanda insan ve cihaz arasındaki etkileşimi de içermektedir. İşte bu etkileşimlerin müşterinin memnuniyetine ve alışverişin verimliliğine etkisi bu çalışmanın ana temasını oluşturmaktadır.

Bu bağlamda araştırmanın amacı, alışverişlerinde akıllı telefonlarını kullanan müşterilerin yaşadıkları akıllı alışveriş deneyimlerinin müşteri tatmini ve alışveriş verimliliği üzerindeki etkisini incelemektir. Öncelikle perakendecinin mağaza (sensör, kamera, QR kod, NFC, RFID vb.) ve yazılım sistemini (depo-stok-sipariş-kasa) mümkün olduğunca akıllı hale getirmesi gerekmektedir. Ardından müşterisine bu sistem ile uyumlu olarak bir mobil uygulama (alışveriş, ödeme ve teklif alabileceği) sunması gerekmektedir. Bu mobil uygulama ile akıllı perakende teknolojileri ne kadar iyi uyumlu çalışırsa o derece fayda üretecektir. Kullanıcı dostu bir mobil uygulama üzerinden işlemlerini kolayca tamamlayan ve fayda elde eden müşteri olumlu bir akıllı bir alışveriş deneyim yaşamış olacaktır.

Satıcılar tarafından tasarlanan mobil alışveriş uygulamalarının kullanım kolaylığı, güvenliği ve kullanıcıya keyif verme özellikleri bu çerçevede sorgulanmıştır. Ortaya konulan hipotezlerle müşterilerin mobil uygulamalar vasıtasıyla gerçekleştirdikleri akıllı alışveriş deneyimlerinin, süreçten memnuniyetleri ve alışveriş verimliliği üzerindeki etkileri incelenmiştir. Daha önceki araştırmalarda ise mobil uygulamalardan ziyade mağaza içi akıllı alışveriş cihazlarına ağırlık verildiği gözlenmiştir.

Araştırmanın temel soruları şunlardır;

- Akıllı alışverişle elde edilen avantajlar müşteride daha pozitif bir alışveriş deneyimi algısı yaratmakta mıdır?
- Kendi cep telefonunda mevcut mobil uygulamaları kullanarak alışveriş gerçekleştiren müşteriler daha tatmin edici ve verimli bir alışveriş deneyimi yaşamakta mıdır?

Bu araştırmanın evrenini Karabük ilinde yaşayan ve alışverişlerinde mobil uygulama kullanan müşteriler oluşturmaktadır. Kartopu örnekleme yoluyla toplamda 310 kişiye ulaşılarak Likert tipi 11 ifadeden oluşan bir araştırma anketi uygulanmıştır. Araştırmada veri analizi SPSS 22 ve AMOS 21 paket programları kullanılarak gerçekleştirilmiştir. Veriler ve değişkenler arası ilişkiler Cronbach Alpha Katsayısı yöntemi, Açıklayıcı Faktör Analizi, Doğrulayıcı Faktör Analizi ve Yapısal Eşitlik Modeli kullanılarak analiz edilmiştir.

Araştırma sonucunda akıllı alışveriş deneyiminin, müşteri tatmini ve alışveriş verimliliği üzerinde anlamlı bir etkisinin olduğu sonucuna ulaşılmıştır. Olumlu bir akıllı alışveriş deneyimi yaşayan müşterilerin alışverişten memnuniyet seviyesi (0,98) oldukça yüksektir Aynı şekilde olumlu bir alışveriş deneyimi, alışveriş verimliliğinin yüksek (0,87) olmasını sağlamıştır. Müşterilerin akıllı alışveriş ortamından memnun olmalarını sağlayan faktörler arasında bu teknolojilerin kullanım kolaylığı ve hızı, teknolojileri kullanmaktan alınan keyif ve veri güvenliğinin olduğu görülmüştür. Akıllı alışveriş deneyiminden memnun olan, alışverişini verimli olarak gerçekleştirdiğini düşünen müşterinin yeniden akıllı alışveriş yapmayı tercih edeceği öngörülebilir. Bu satın alma davranışı, perakendeciler açısından anlamlı bir sonuçtur.

## Introduction

Recently, retailers have started to use many smart retailing technologies including radio frequency identification systems (RFID), near field communication systems (NFC), augmented-reality interactive technology systems (ART) interactive displays, smart shopping carts and shopping assistant systems in stores worldwide (Grewal, Iyer, Gotlieb, Levy, 2007). Therefore, retailers should be more vigilant to understand the new trends and SRTs possible effects on consumer dynamics and create ways to offer customers satisfied shopping experience in this highly dynamic and evolving concept.

As customers began to taste technologically advanced retail services, it became essential for retailers to examine consumers' SRT experiences in terms of mobile consumer behaviors. Mobile device use in every aspect of daily life increased in a very large scale especially as a result of advancements in mobile internet technologies (4G, 5G) which allowed faster data download and share.

Users are able to perform many online transactions without any time and place limits with their smart phones that have powerful processors and connection speeds. Trends show that physical stores will hardly be able to compete against virtual stores.

The share of e-commerce in total retailing and the share of m-commerce in total e-commerce gradually increase. This suggests that offline retailers need to adapt to the mobile world retailing dynamics. Especially new generation consumers prefer shopping and making payment quickly by using phones without waiting in lines. They would like to see different clothing on themselves using smart mirrors or how the new furniture will look like in their living room before they actually buy it. Mobile technologies change habits and behaviors really fast and retailers had better foresee and understand new trends and invest more to provide consumers better shopping experiences.

Because of the progressive development and widespread use of smart technologies in any field of daily life, the integration of smart retail technologies with the consumers' smartphones became a vital issue for retailing. Retailers who want to gain competitive advantage by achieving this integration efficiently should pay more attention to their own SRTs and mobile applications. Mobile phone apps offered by retailers bridges the gap between SRTs and the customers leading to smarter shopping experiences. In an increasingly competitive environment in the retail industry, physical stores build their existing business models on smart retailing systems to improve customer experience (Roy, Balaji, Sadeque, Nguyen, Melewar 2017). In this study the concept of "smartness" is related with technologic processes developed by retailers, efficiency, increased customer satisfaction and benefits for all sides.

In literature most studies have addressed SRT as a whole process and it wasn't clear how the customer would be involved in these processes. This study included the customer as a smart mobile technology user in retailing and examined their satisfaction. This study contributes to SRT and marketing literature by empirically examining the smart shopping experience of the customer who involved in SRT by his smart phone using mobile apps offered by retailer. Up until now, the studies about the dynamics of changes of consumers' behaviors and attitudes caused by smart retailing technologies are limited. Also understanding the value generating process of satisfied customer experience in smart retailing environment need more rigorous empirical studies.

Using SRTs the customer has the opportunity to benefit from the advantages offered by the online and physical retail store by just downloading the retailer's mobile shopping application. Among the main questions of this research are; Do advantages of SRTs use help consumers to have a better shopping experience? Do the customers who experience SRTs using

---

mobile apps have more satisfactory and productive shopping process? If the customer is satisfied and achieves efficiency, he wants to stay in the system. Remaining consumers within the system will benefit the business in terms of competition and profitability. Therefore, the development of SRT in the sector is directly proportional to the benefits consumers get within this smart system.

In the literature, preliminary studies in this field analyze the acceptance of SRT (Clodfelter, 2010; Pantano and Servidio, 2012; Anderson and Bolton, 2015; Huang and Liao, 2015). Subsequent researches focus on examining emerging smart retailing technologies such as augmented reality, radio-frequency identification (RFID) technology and shopping assistants. Studies showed these technologies used in the retailing sector aimed at increasing sales, improving customer relations and satisfaction. Also some studies aimed to understand how those technologies affected customer experience (Belk, 2010; Pantano and Timmermans, 2014; Hoffman and Novak, 2015). However, in this study, there is a direct interaction between SRT and the customer. This interaction is provided through the retailer's mobile apps. The consumer experience during this interaction is called as the smart shopping experience. In addition, we think that the main purpose of smart retailing is to connect customers' digital and physical worlds. Therefore, unlike other studies, in this study, SRT is considered as technologies that the customer interact through his/her mobile phone. The experience within this dimension is not only a machine-machine interaction, but also a human-machine interaction. In this study this interaction and its contribution to customer satisfaction and process productivity has been examined.

Developments in mobile internet technology and the spread of 5G enables daily shopping processes very practical. On the other hand, machine-to-machine communication provides value in shopping. Not only our phones but also many retailing systems are getting smarter. In the future, refrigerators may be able to place an order automatically when the predetermined minimum food levels are reached (machine to machine commerce). Smart retailing is expected to provide more personalized and quality service. Therefore, investments in SRT will contribute to customer satisfaction, better retailer-customer relationship and customer loyalty.

This study is based on three basic parameters. Rapidly developing mobile technologies, retailers following and acquiring these technologies and customers who have an increasing tendency to use technological infrastructure provided. Intense competition forces retailers to take technological trends and new customer behaviors derived into consideration in retail market. In such a competitive environment, it is imperative to offer better customer experience.

In this study, it is emphasized that retailers need to keep up with the developing smart retailing technologies and switch to smart retailing in time by observing customer needs and behaviors. Because consumers having smart phones seek for more satisfied smart shopping experience from smart stores. In this research, the effects of the smart shopping experience with a convenient and featured mobile application were examined. Within this research model, the effects of smart customer experience on customer satisfaction and shopping productivity were analyzed to figure out the motivations for future possible shopping experiences.

## **Conceptual Background**

### **Smart Retailing**

Rapid technologic advancements cause a transformation in retailing. Retailers prefer to use smart retailing technologies in order to enhance consumer shopping experiences and for their own ability of sustainable competitiveness (Priporas, Stylos, Fotiadis, 2017). A technology can be called as 'smart' as long as an electronic device or system can be used online and

---

interactively. Smart objects composing the system are connected and synchronized with one another, sense the environment and function autonomously (Foroudi, Gupta, Sivarajah, Broderick, 2018).

Smart retailing is referred to the use of smart devices functioning through wireless technology in retailing (Atzori, Iera, Morabito, 2010). RFID, augmented reality, mobile location-based services (LBS) and QR code applications are among the most remarkable trends in retailing industry. Communication technology and smart retailing technologies together are transforming consumer-retailer interactions.

Smart retailing technology allow costumers have a sense of flexibility, connects the digital and physical worlds and enables a real-time interactive relation between retailers and customers (Gregory, 2015: 4). Retailers develop new capabilities with real time interaction in terms of controlling, autonomy, monitoring and optimization (Porter and Heppelmann, 2014). Contactless technologies also offer new ways of supporting retail processes as in automatic payment and self-checkout applications (Lai and Chuah, 2010). As mobile technologies are being used extensively, the concept in retailing sector changes. Smart technologies enable stores acquire new capabilities about limits related to store hours, locations and dimensions. (Pantano, 2013).

Smart retailing has different specifications than e-commerce. E-commerce is only a digital platform and basically a web site but smart retailing connects digital and phsycal platforms with innumerable sensors, smartphones and retailing applications. Retailers can offer customers numerous experiences in stores with tablets which have informative interactive screens as in McDonald's fast food retail stores. Smart retailing aims to foresee the customer needs in advance and able to make different matching options during shopping process. Another goal of using SRT is to provide consumers enriched information based on location and mutual interaction.

Smart phones are great tools for smart retailing in terms of functioning at connecting consumers' online and physical worlds. Mobile applications that well designed and fictionalised are building blocks of smart retailing today. Actually retailers and consumers are interacting on a common ground (mobile apps) designed by retailers, which can be referable as smart partnership seeking reciprocal satisfaction (Pantano and Timmermans, 2014).

### **Smart Shopping Experience in a Smart Retailing Environment**

Customer experience is the perception or acknowledgment of a customer deriving from his/her observation or participation in an event which can enrich the value of services and products (Schmitt, 1999). Smart shopping experience refers to the perceptions or acknowledgements of customers as a result of their shopping practices at a smart retailing environment where smart retailing technologies communicated and integrated with consumers' mobile devices.

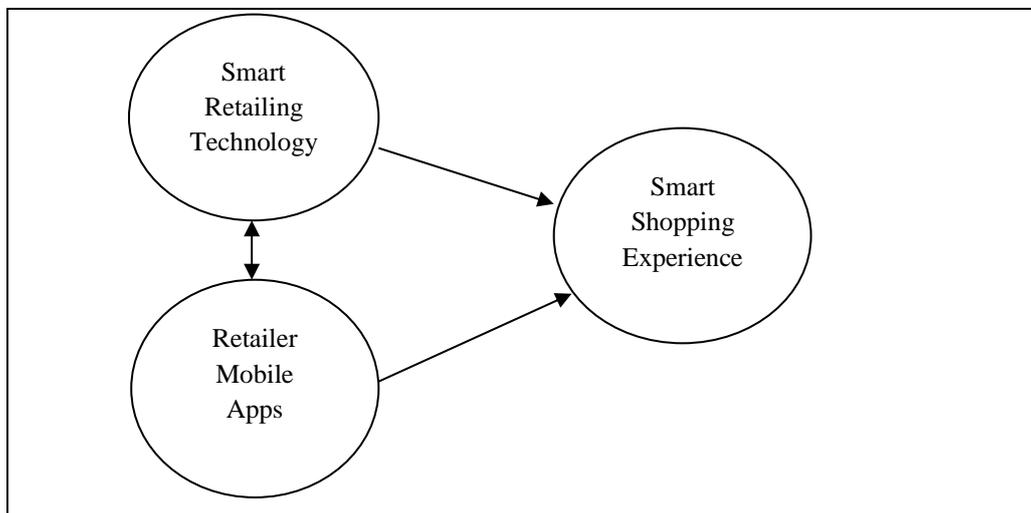
The contact points between firms and customers increased due to the progresses in smart technologies. It was observed that the quality of the experience at those numerous contact points had effects on customer preferences and purchasing considerations (Yakhlef, 2015).

In this study 'smart shopping experience' refers to the customer shopping experience in a smart retailing ecosystem. A positive smart shopping experience points out the contributions to the customer's purchasing process by the use of unique mobile applications. Retailers may utilize their mobile apps to advertise their promotions or to apply their pricing strategies. The output of the retailer-customer interaction in SRT environment must be positive and value creating for each part. Retailers expect to have customer satisfaction leading to customer loyalty and profitability.

---

Firms are able to set large scale database using smart technology like mobile apps, Que Vision, scan-and-go and smart shelf technologies. Advance database helps retailer better understand their target group, provide them more customized offers and create more sensible marketing mix (Grewal et al., 2007).

Retailers help customers make more rational purchasing decisions by providing them enriched information which ensures shopping productivity. Supporting consumers who conduct research during the shopping process increases customer satisfaction. In cases where unplanned purchasing behavior develops, the guidance of the retailer is very effective. Unplanned purchasing behaviors may be affected by retailers using SRT to guide consumers. Brand new technologies revolutionize the customers' shopping experiences and way of retailing. For example Amazon Go stores offer their customers a smart retailing environment where customers can use their smartphones to enter the store and complete their purchase and leave without wasting time in lines. They are being charged automatically by pre-set applications through their mobile phones. In their retailing system customers need a smartphone, a pre-set account, and a mobile Amazon Go applications (Amazon, 2016). The background of this research model is shown at Figure 1 below.



**Figure 1:** The Background of the Research Model

As seen in Figure 1 smart shopping experience have two dimensions. First smart technologic systems offered by retailers and second consumers integrated to those systems through their smart mobile phones.

### Related Works

Literature review reveals many researches on customer behaviors in smart retailing environment. Summaries of some of those studies are given below. Generation Z consumers are more focused on innovation and smart technologies have a significant effect on their shopping experiences (Priporas et al. 2017). Among the key areas which move the retailing forward are technology, tools to facilitate decision making, visual display, big data collection and usage. Also internet of devices, virtual reality, augmented reality and artificial intelligence are important areas of emerging applicability in retailing (Grewal et al. 2017).

The use of in-store smart technologies positively affect shopping experience in retailing. These new technologies modify the appearance of point of sales, improve shopping experience and influence future purchase behavior (Pantano and Naccarato 2010). Smart customer experiences have consequences on smart technology itself, customers and retailers (Roy et al., 2017). Retailers are eager to use technology to improve selling efficiency and to enhance the

communication among all actors in the process (Pantano 2014). The customer dynamics like searching, comparing and evaluating may affect customer experience in a value created retail environment by the use of smart technologies (Foroudi et al. 2018). In tourism and hospitality industry smart mobile technologies can facilitate more meaningful personalized customer experiences (Neuhofer, Buhalis, Ladkin, 2015).

Mobile technologies are getting used extensively in retailing. For retailers it's crucial to understand the impacts of mobile apps use on consumer behaviours and the motivation leading customers to use mobile apps (Pantano and Priporas, 2016). The main features of organizational and practical dimensions of smart retailing concept include the need for developing ad-hoc capabilities, the changes in knowledge management processes, generating smart partnerships, service access changes, changes in roles of salespersons, changes in consumption and consumer behaviours compared to traditional shopping (Pantano and Timmermans 2014).

In this study, smart shopping experience is defined as a technology component mediated smart retailing. The key components of smart shopping experience include personalization, relative advantage, perceived control, interactivity and enjoyment. Smart shopping experience includes intelligent technology use, behavioral and affective elements and cognitive abilities (Palmer, 2010; Van Noort and Willemsen, 2012). Relative advantage is the cognitive element of smart shopping experience (SSE) which refers to the degree to which smart retailing technology (SRT) is perceived compared to existing retail technologies (Gao and Bai, 2014). Perceived control refers to the extent of controlling the shopping process using smart retailing technology (Lee, Phaal, Lee, 2013). Perceived interactivity is a cognitive perspective of customers about their subjective and general assessment of the interaction using smart retailing technology (Scardamalia and Bereiter, 2014). Perceived enjoyment is an emotional perspective related to the pleasure or enjoyment felt by consumers using smart retailing technologies (Choi and Park, 2014a). Personalization means the ability of smart retailing technology about offering individualised or customized services to customers (Neuhofer et al., 2015).

Smart retailing technologies (SRTs) were subject to many researches from different perspectives. Poncin et al. (2017) analyzed the effect of gamification mechanics, a tool widely used in the design of smart technologies, on customers' experience, emotions and emerging behavioral intentions. Hong et al. (2017) states that consumers tend to easily adopt SRTs and use them more frequently provided that they feel SRTs' performance meet their expectations. Adapa et al. (2020) examined the antecedents and consequences of the smart retailing technology and perceived shopping value. Rajithkumar et al. (2018) worked on a project about a smart system design in shopping centers. This system was composed of smart shopping carts and shelf systems working based on weight sensors. Bellis and Johar (2020) identified autonomous shopping systems and the obstacles to their acceptance. He also made suggestions to companies on methods to overcome those difficulties. In his research Dacko (2017) examined the way, reason and the degree of the contributions of mobile augmented reality (MAR) applications on smart retailing environment by creating customer value and retailer benefits. He focused on assessing usage levels, the benefits of experiencing MAR shopping apps and consequences for retailing. In their study, Flavian et. al. , (2020), sought to understand how some specific combinations of online and physical shopping channels have effects on the consumers' perceptions and feelings about smart shopping. Pantano et. al., (2018) investigated how luxury industry perceive and use smart retailing technologies. This research revealed that luxury brands were aware of the benefits offered by the use of smart technologies but believed that the efficiency was still limited.

## Research Method, Model and Development of Hypotheses

### Questionnaire Design and Data Collection

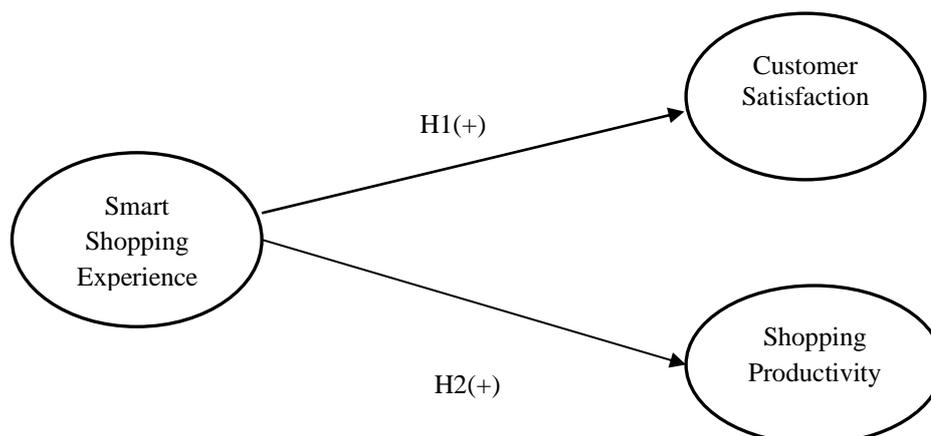
The universe of this research is composed of consumers who live in Karabuk and use mobile shopping applications. The sample 310 people were reached by snowball sampling using mobile messaging and social networking. MacCallum et al. (1999) stated that the sample size should be at least 10 times the number of statements in the scale, according to the ratio rule. Kline (2011) stated that around 200 sample sizes are sufficient in structural equation model (SEM) type surveys. In this study, 11 Likert type statements were used and 310 completed questionnaire were accepted.

The measurements of the variables used in the research model were based on scales adapted from various sources. These sources are as follows: "Satisfaction" Roy et al. (2017), Wang et al. (2012); "Shopping Productivity" Roy et al. (2017), Collier et al. (2015); "Comparative Advantage" Chen et al. (2013), Venkatraman (1991); "Perceived enjoyment" Sun and Zhang (2006); "Perceived Control" Trevino and Webster (1992), Nysveen et al. (2005); "Personalization" Roy et al. (2017), Veloutsou and McAlonan (2012); "Interaction" Choi and Taylor (2014). These statements from different literature have been translated into Turkish by the researcher. Afterwards, two different academicians who were experts in marketing and management were asked to translate the statements again. After the comparison the draft questionnaire was applied to 40 person as part of a pilot test. The latest modified questionnaire included 4 statements related to demographic specifications and 11 statements about mobile shopping application usage in stores.

The statements were designed according to five point Likert Scale (from "1: I Absolutely Disagree to 5: Absolutely Agree). In order to investigate the conceptual factors of the scales belonging to the variables included in the model, AMOS 21 package program was used in explaining the casualty between the variables by using explanatory factor analysis, confirmatory factor analysis and structural equation modeling.

### Research model

The research model that shows the relations between dimensions is given in Figure 2 below.



**Figure 2:** The Research Model

Mobile applications in smart retailing environment provides capacity for promoting customers' shopping experience. Mobile apps well designed by retailers have a potential to

increase customer satisfaction. Smart retailing technologies help consumers make better purchase decisions without feeling time pressure.

The shopping productivity is the concept used in shopping context as a value proposition as considering total outputs and inputs of the shopping process. It stands for the total value of total shopping experiences. Productive shopping means minimum costs of consumption and satisfied outputs of consumption like goods, information for future purchases and pleasure from shopping process (Park and Park, 2009).

### **Research hypotheses**

Customers' satisfaction and their intention to maintain usage of mobile applications in purchases are seen as key factors in sellers and customers loyalty relationship. Customer satisfaction is the general opinion and response of the customer about the difference between pre-purchase expectation and perceived performance (Hsiao, Chang, Tang, 2016). According to the research by Kuo et al. (2016), there is a positive correlation between customer satisfaction and customer loyalty. Customer loyalty increases in parallel with the level of customer satisfaction from products or services (Kuo, Tsai, LuChang, 2016). Customer satisfaction plays a distinctive role in marketing theory and practices. Because customer satisfaction leads to a change of attitude relating the decisions on re-shopping intentions and loyalty after shopping experience (Xu, CPeak, Prybutok, 2015). Hsiao et al. (2016) found that customer satisfaction and mobile application use significantly related to the intention to continue to use those applications in future shoppings (Hsiao et al., 2016). According to the research by Xu et al. (2015), customer satisfaction on mobile applications usage has a positive impact on customers' intention to continue using mobile applications (Xu et al., 2015). Based on the above discussion we set forward the following hypothesis:

H<sub>1</sub>: Smart shopping experience will have a positive impact on customer satisfaction.

Customer satisfaction is the result of but a cumulative evaluation of not a specific process but whole relationship history between the customer and the provider, (Casaló et al., 2008). In this study shopping productivity is related to the experience consumers lived using mobile shopping applications. Shopping productivity refers to the result oriented from a productive shopping experience at all stages of the shopping process, starting from the emergence of the needs until post-purchase opinions. Customers will describe this process as effective if only they believe they have completed the process gaining benefits without any difficulties. This productivity evaluation is performed by comparison of pre-purchase and post purchase personal satisfaction about shopping using mobile applications. The positive experience is depended upon the benefits achieved by use of the mobile shopping application. Mobile shopping application should add value to the shopping experience, help with decision-making and provide speed and convenience in this process (Collier et al., 2015). As a result of foregoing discussion we advance the following hypothesis:

H<sub>2</sub>: Smart shopping experience will have positive impact on shopping productivity.

The fact that smartphones are easy to carry and connect to the internet almost anytime and anywhere ensures them to play an important role in assisting our shoppings. Customers anticipate their mobile shopping experience more productive when they can perform their transactions faster and convenient both in brick and mortar or completely online stores. Shopping productivity can vary depending on situational factors and customer characteristics.

### **Data Analysis and Findings**

The participants' demographic characteristics are given in Table 1 below.

**Table 1:** Demographic characteristics of participants

---

Variables		f	%
Gender	Female	104	33,5
	Male	206	66,5
Age	Under 18	3	1,0
	Between 18-36	269	86,8
	Between 37-55	38	12,3
Education	High School Grad	16	5,2
	Associate Degree	169	54,5
	Graduate Degree	92	29,7
	Post Graduate	33	10,6
Monthly Income	Under 1300YTL	98	31,6
	Between 1301-2600YTL	85	27,4
	Between 2601-3900YTL	52	16,8
	Between 3901-5200TL	37	11,9
	Over 5201 YTL	38	12,3
Mobile Application Usage Frequency in brick and mortar stores	Never	83	26,8
	Very Rare	77	24,8
	Sometimes	97	31,3
	Often	44	14,2
	Always	9	2,9

The distribution of participants' demographics is shown in Table 1. As seen in the table the majority of the participants are male (66.5%). The majority of the participants belong to 18-36 age group (86.8%). In terms of educational status, 54,5 % of the participants have associate degree while 29,7 % of them have graduate degree. When the income status of the participants is examined, it is seen that the majority of the participants belong to the income group of 1300 TL or less (31,6%).

Analysis about the frequency of in-store smartphone usage show that of the respondents 31.3% occasionally, 14.2% frequently and 2.9% always use their smartphones during in-store shopping. It can be said that a significant proportion of overall respondents that is 48.4% in total uses their smart phones in the store. This high rate can be attributed to the fact that 86.9% of the participants are young active mobile users between the ages of 18-36. Also 84.2% of the responders has bachelor degree. Therefore, results show that the level of technology use in retailing is very high among young and highly educated generation.

## Evaluation of Structural Equation Model

### Reliability and explanatory factor analysis

All of the 11 Likert type statements used in this study were subjected to reliability analysis. Cronbach's Alpha value was calculated as  $\alpha = 0,928$ , which means that the entire scale was highly reliable. Since the Kaiser-Meyer-Olkin (KMO) test result was found as  $0.946 > 0.70$ , the sample size was accepted as sufficient. The result of Bartlett's Test of Sphericity ( $0.00 < 0.01$ ) showed that expressions in the scale were consistent with each other. The factor loadings of the scale statements were above 0.70 and the explained total variance was 71,839%. Separate reliability analysis for each scale and the results of KMO and Bartlett Sphericity tests were also given in Table 2 below.

**Table 2:** Explanatory Factor Analysis (EFA) for scales

Scales	Statements	Factor Load	Values
Smart Shop	SSE1 Mobile shopping application use gives me a better shopping experience.	,601	KMO: ,789

	SSE2	Using mobile shopping applications provides me a lot of enjoyment.	,820	Bartlett S.T. : ,000 α: ,800 Tot. Var.: 89,688
	SSE3	I feel in control while using mobile shopping applications.	,630	
	SSE4	The interaction quality provided by mobile shopping applications is outstanding in performing my shopping process.	,582	
Satisfaction	SAT1	I am entirely satisfied with using mobile shopping applications.	,718	KMO: ,720 Bartlett S.T. : ,000 α: ,830 Tot. Var.: 100,00
	SAT2	The benefits I get from mobile shopping applications exceed my expectations.	,776	
	SAT3	Mobile shopping application usage is an ideal retail technology.	,770	
Shopping Productivity	SP1	Using mobile shopping applications allows me to have a more productive shopping experience.	,740	KMO: ,832 Bartlett S.T. : ,000 α: ,898 Tot. Var.:94,293
	SP2	Using mobile shopping applications improves my shopping experience productivity.	,780	
	SP3	I find that using mobile shopping applications can help me to have a smoother shopping experience.	,780	
	SP4	Using mobile shopping applications can enhance my capability to complete a shopping trip easily.	,812	

As seen in Table 2 all factor loadings except some SSE statements which were related to smart shopping experience dimension are above 0,70. However, since the factor loads above 0.40 were acceptable we decided to keep those expressions (Kalaycı, 2010: 405). KMO, Bartlett Sphigmomanity Test and reliability analysis results were also over the desired levels which resulted the fact that the scale was reliable and the scale-forming expressions were consistent with each other.

**Confirmatory factor analysis and structural equation model**

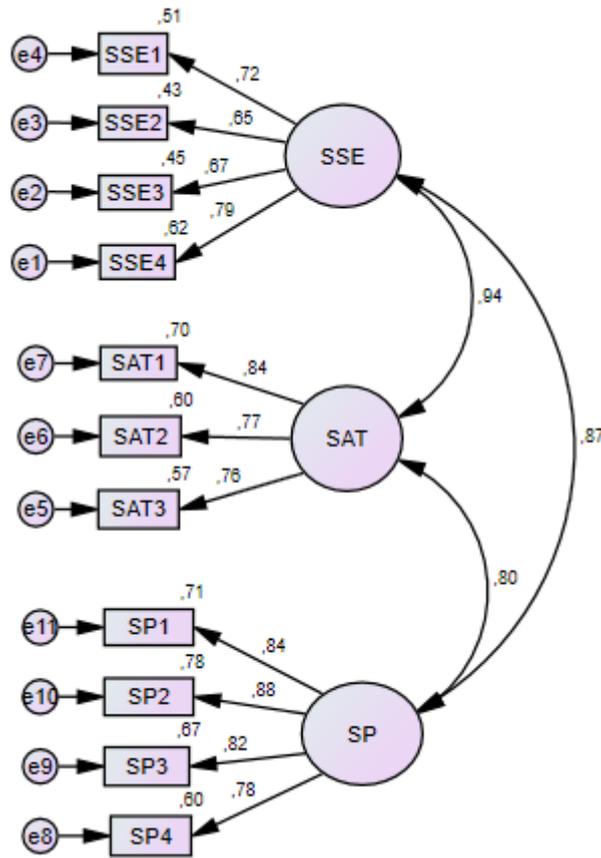
In the structural equality method there are two basic elements; the measurement model and the structural model. The statements related to unmeasurable variables are tested by associating them with observable variables in the structural model. Confirmatory factor analysis are conducted to test the resulting factors obtained by explanatory factor analysis. The value ranges for goodness of fit index are shown in Table 3.

**Table 3:** Goodness of fit index

Fit indices	Good fit	Acceptable fit
$\chi^2/df$	$0 \leq \chi^2/df \leq 2$	$2 < \chi^2/df \leq 5$
RMSEA	$0 \leq RMSEA \leq ,05$	$,05 < RMSEA \leq ,09$
GFI	$,90 \leq GFI \leq 1$	$,85 \leq GFI < ,90$
AGFI	$,90 \leq AGFI \leq 1$	$,85 \leq AGFI < ,90$
CFI	$,97 \leq CFI \leq 1$	$,95 \leq CFI < ,97$
TLI	$,95 \leq TLI \leq 1$	$,90 \leq TLI < ,95$

**Source:** Hu and Bentler 1999: 27; Schermelleh-Engel et al., 2003: 52; Schumaker and Lomak, 2004: 148.

After applying confirmatory factor analysis (CFA) to each scale, the whole scale was subjected to CFA. The regression coefficients after CFA are shown in Figure 3 below.



**Figure 3:** Confirmatory Factor Analysis for The Whole Model

The goodness of fit values for the whole model are given in Table 4 below.

**Table 4:** Goodness of fit values for the structural model after CFA

$\chi^2/df$	RMSEA	GFI	AGFI	CFI	TLI
1,134	0,021	,974	,958	,997	,996

The AVE (Average Variance Extracted) and CR (Composite Reliability) values which show the reliability of the model are shown in Table 5 below.

**Table 5:** AVE and CR values of structural model

Variables	Composite (CR)	Average Variance (AVE)	Extracted
Satisfaction	0,832	0,623	
Smart Shopping Experience	0,801	0,503	
Shopping Productivity	0,899	0,690	

CR > ,70 ve AVE > ,50

The values in Figure 3, Table 4 and Table 5 show that regression coefficients, goodness of fit values, AVE and CR values are at desired levels. Thus, the tested structural model has a good fit and the model variables are reliable. This indicates that structural model path analysis can be performed after CFA.

The relationship between the measured variables are examined and shown in Table 6. As seen in the table below all variables have a positive and strong relationship between each other.

**Table 6:** Correlation between model variables

Variables	Variables	Correlation
-----------	-----------	-------------

Smart Shopping Experience	<-->	Satisfaction	,935
Smart Shopping Experience	<-->	Shopping Productivity	,870
Satisfaction	<-->	Shopping Productivity	,803

**Structural equation model**

The reliability of the scales were tested and verified by using EFA and CFA. The whole research model and evaluation of all variables is shown in Figure 4 below.

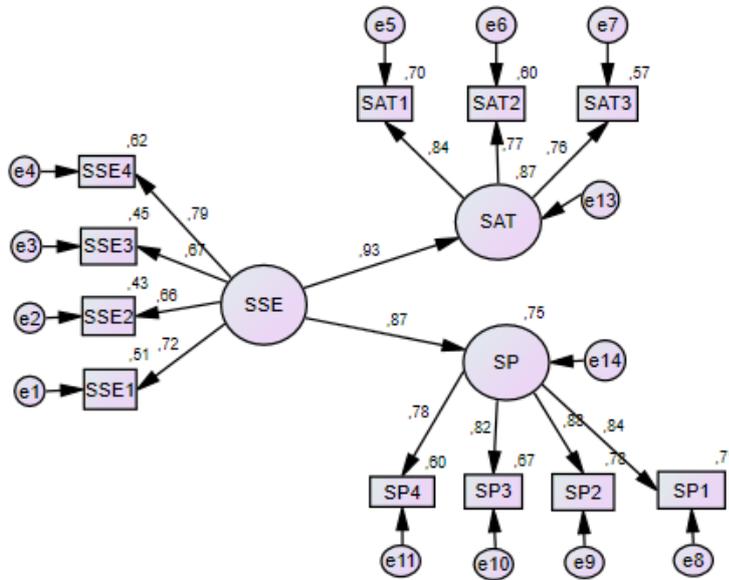


Figure 4: Structural Model

The post path analysis SEM goodness of fit values are given in Table 7 below.

Table 7: Post path analysis, SEM goodness of fit values

$\chi^2/df$	RMSEA	GFI	AGFI	CFI	TLI
1,109	0,019	,974	,959	,998	,997

According to the values in Table 7 all compliance values of the structural model were between desired range and the model had a good fit. According to R2 values in Figure 4, the explanatory ratio between SSE and satisfaction was 0,93 and same ratio between SSE and shopping productivity was 0,87.

According to the regression coefficients shown in Figure 4, SSE had a meaningful and positive impact on satisfaction (0,98) and shopping productivity (0,87). As a result of analysis obtained hypothesis results are given in Table 8 below.

Table 8: Hypothesis results

Hypothesis	H1	H2
Results	Accepted	Accepted

**Conclusions and Discussions**

Mobile devices enable customers to learn customized offers constantly without any time and place constraints. Among the advantages of mobile shopping application usage are accessing product information, price comparison, stock information, user comments and social media messages. Increased mobile internet speed, cheaper internet providing costs and fast developing smartphone technologies intensified mobile shopping application usage. This result enforced businesses to review their marketing strategies and changed consumer behaviors. Customers are in a stronger position against sellers compared to the past since ease of access to

brand or product information for comparison before purchase decision. They usually surf the internet first for a product or service and then choose to buy it from brick and mortar store or see and try the product at the store and buy it online.

Customers exchange information through multiple smart devices like smart phones, laptops and tablets by interacting with smart retailing technology systems employed by retailers. Due to the new trends and changes in consumer behaviors being affected by developing mobile technology, retailers are investing heavily in new technologies like interactive mobile shopping apps supported by RFID tags, virtual stores or self-cash desks (Pantano and Timmermans, 2014).

Retailers who ignore mobile marketing strategies will face the risk of losing their competitiveness because of possible service inadequacy and customer dissatisfaction in smart retailing. Mobile purchase payment systems are becoming increasingly widespread. Soon customers will be able to make their payments through their mobile devices even in brick and mortar store cash registers. Retailers need to keep pace with this transformation in order to gain competitive advantage. The use of smart kiosks and mobile payment systems in retail businesses will allow retailers to focus other critical fields in their business and customer satisfaction. In recent years, it has been seen that retailers are focusing on mobile wallets payment applications, GPS (Global Positioning System) and location-based applications (iBeacon) to further enhance the user experience in smart shopping context. For example, in a physical eBay store in London there is no product available in the store but information available. Customers access product information by scanning QR codes on the shelves and complete their shopping using their mobile devices. In another example, the American retail giant Walmart in their virtual toy stores provide their customers smart shopping experience by allowing them to complete their informed shopping by scanning QR codes. Many retailers including Tesco-Homeplus and Omega have virtual stores where smart shopping available using QR codes only. Electronic retailing giant Amazon is the best example who took over Whole Foods and offered their customers smart shopping experience where there are no cashiers in the stores at all and the billing is performed through mobile applications (Amazon Go, 2019).

This research showed that businesses who provide a gratifying smart shopping experience generate customer satisfaction (0,98) and shopping productivity (0,87). Businesses gain competitive advantages if they manage to offer a smart shopping experience that is fast, easy and secure. This study showed that customers were satisfied (0,98) from mobile shopping application use if they experienced ease of use, had enjoyment and benefitted from application usage.

Deep learning occurs in stores that are autonomous by means of cameras, sensors, infrared scanners and computer vision technology. Datas on shopping history and behaviours of customers are highly valuable for retailers. By gathering simple information such as how many people touched a particular product, the aisles that men liked to visit most, the shopping time of women, customers' movement patterns or buying habits can be modeled by help of smart retailing technology components. Future studies may focus on investigating how smart retailing will lead to changes in consumer behavior and its contribution to customer relationship management and data mining.

### References

- Adapa, S., Fazal-e-Hasan, S. M., Makam, S. B., Azeem, M. M., & Mortimer, G. (2020). Examining the antecedents and consequences of perceived shopping value through smart retail technology. *Journal of Retailing and Consumer Services*, 52, 101901.

- Amazon (2016), Amazon Go: Frequently Asked Questions (accessed June 6, 2018), [https://www.amazon.com/b?node=16008589011]
- Anderson, M., & Bolton, J. (2015, October). Integration of sensors to improve customer experience: Implementing device integration for the retail sector. In 2015 IEEE 12th International Conference on e-Business Engineering (pp. 382-386). IEEE.
- Atzori, L., Iera, A., & Morabito, G. (2010). The internet of things: A survey. *Computer networks*, 54(15), 2787-2805.
- Belk, R. (2010). Sharing. *Journal of consumer research*, 36(5), 715-734.
- Casaló, L. V., Flavián, C., & Guinaliú, M. (2008). Promoting consumer's participation in virtual brand communities: A new paradigm in branding strategy. *Journal of Marketing Communications*, 14(1), 19-36.
- Clodfelter, R. (2010). Biometric technology in retailing: Will consumers accept fingerprint authentication?. *Journal of Retailing and Consumer Services*, 17(3), 181-188.
- Collier, J. E., Moore, R. S., Horky, A., & Moore, M. L. (2015). Why the little things matter: Exploring situational influences on customers' self-service technology decisions. *Journal of Business Research*, 68(3), 703-710.
- de Bellis, E., & Johar, G. (2020). Autonomous Shopping Systems: Identifying and Overcoming Barriers to Consumer Adoption. *Journal of Retailing*. 96 (1), 74-87.
- Dacko, S. G. (2017). Enabling smart retail settings via mobile augmented reality shopping apps. *Technological Forecasting and Social Change*, 124, 243-256.
- Flavián, C., Gurrea, R., & Orús, C. (2020). Combining channels to make smart purchases: The role of webrooming and showrooming. *Journal of Retailing and Consumer Services*, 52, 101923.
- Foroudi, P., Gupta, S., Sivarajah, U., & Broderick, A. (2018). Investigating the effects of smart technology on customer dynamics and customer experience. *Computers in Human Behavior*, 80, 271-282.
- Gao, L., & Bai, X. (2014). Online consumer behaviour and its relationship to website atmospheric induced flow: Insights into online travel agencies in China. *Journal of Retailing and Consumer Services*, 21(4), 653-665.
- Gregory, J. (2015). The Internet of Things: revolutionizing the retail industry. *Accenture Strategy*.
- Grewal, D., Iyer, G. R., Gotlieb, J., & Levy, M. (2007). Developing a deeper understanding of post-purchase perceived risk and behavioral intentions in a service setting. *Journal of the Academy of Marketing Science*, 35(2), 250-258.
- Grewal, D., Roggeveen, A. L., & Nordfält, J. (2017). The future of retailing. *Journal of Retailing*, 93(1), 1-6.
- Hsiao, C. H., Chang, J. J., & Tang, K. Y. (2016). Exploring the influential factors in continuance usage of mobile social Apps: Satisfaction, habit, and customer value perspectives. *Telematics and Informatics*, 33(2), 342-355.
- Hoffman, D. L., & Novak, T. (2015). Emergent experience and the connected consumer in the smart home assemblage and the internet of things. Available at SSRN 2648786.
-

- Hong, J. C., Lin, P. H., & Hsieh, P. C. (2017). The effect of consumer innovativeness on perceived value and continuance intention to use smartwatch. *Computers in Human Behavior*, 67, 264-272.
- Huang, T. L., & Liao, S. (2015). A model of acceptance of augmented-reality interactive technology: the moderating role of cognitive innovativeness. *Electronic Commerce Research*, 15(2), 269-295.
- Kuo, T., Tsai, G. Y., Lu, I. Y., & Chang, J. S. (2016). Relationships among service quality, customer satisfaction and customer loyalty: A case study on mobile shopping APPs. *Proceedings of the 17th Asia Pacific Industrial Engineering and Management Systems Conference (APIEMS '16) (2016)* 1-8
- Kalaycı, Ş. (2010). SPSS uygulamalı çok değişkenli istatistik teknikleri (Vol. 5). Ankara, Turkey: Asil Yayın Dağıtım.
- Lai, P. M., & Chuah, K. B. (2010). Developing an analytical framework for mobile payments adoption in retailing: a supply-side perspective. In *2010 International Conference on Management of e-Commerce and e-Government* (pp. 356-361). IEEE.
- Lee, J.H., Phaal, R., & Lee, S.H., (2013). An integrated service-device-technology roadmap for smart city development. *Technol. Forecast. Soc. Chang.* 80(2), 286–306.
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2015). Smart technologies for personalized experiences: a case study in the hospitality domain. *Electronic Markets*, 25(3), 243-254.
- Palmer, A. (2010). Customer experience management: a critical review of an emerging idea. *Journal of Services Marketing*, 24(3), 196-208.
- Pantano, E., & Naccarato, G. (2010). Entertainment in retailing: The influences of advanced technologies. *Journal of Retailing and Consumer Services*, 17(3), 200-204.
- Pantano, E., & Servidio, R. (2012). Modeling innovative points of sales through virtual and immersive technologies. *Journal of Retailing and Consumer Services*, 19(3), 279-286.
- Pantano, E. (2013). Ubiquitous retailing innovative scenario: from the fixed point of sale to the flexible ubiquitous store. *Journal Of Technology Management & Innovation*, 8(2), 84-92.
- Pantano, E., & Timmermans, H. (2014). What is smart for retailing?. *Procedia Environmental Sciences*, 22, 101-107
- Pantano, E. (2014). Innovation drivers in retail industry. *International Journal of Information Management*, 34(3), 344-350.
- Pantano, E., & Priporas, C. V. (2016). The effect of mobile retailing on consumers' purchasing experiences: A dynamic perspective. *Computers in Human Behavior*, 61, 548-555.
- Pantano, E., Passavanti, R., Priporas, C. V., & Verteramo, S. (2018). To what extent luxury retailing can be smart?. *Journal of Retailing and Consumer Services*, 43, 94-100.
- Park, M., & Park, J. (2009). Exploring the influences of perceived interactivity on consumers'e-shopping effectiveness. *Journal of Customer Behaviour*, 8(4), 361-379.
- Poncin, I., Garnier, M., Mimoun, M. S. B., & Leclercq, T. (2017). Smart technologies and shopping experience: Are gamification interfaces effective? The case of the Smartstore. *Technological Forecasting and Social Change*, 124, 320-331.
- Porter, M. E., & Heppelmann, J. E. (2014). How smart, connected products are transforming competition. *Harvard Business Review*, 92(11), 64-88.
-

- 
- Priporas, C. V., Stylos, N., & Fotiadis, A. K. (2017). Generation Z consumers' expectations of interactions in smart retailing: A future agenda. *Computers in Human Behavior*, 77, 374-381.
- Rajithkumar, B. K., Deepak, G. M., Uma, B. V., Hadimani, B. N., Darshan, A. R., & Kamble, C. R. (2018). Design and Development of Weight Sensors Based Smart Shopping Cart and Rack System for Shopping Malls. *Materials Today: Proceedings*, 5(4), 10814-10820
- Roy, S. K., Balaji, M. S., Sadeque, S., Nguyen, B., & Melewar, T. C. (2017). Constituents and consequences of smart customer experience in retailing. *Technological Forecasting and Social Change*, 124, 257-270.
- Scardamalia, M., & Bereiter, C., (2014). Smart technology for self-organizing processes. *Smart Learn. Environ*, 1 (1), 1–13.
- Schmitt, B.H. (1999). *Experiential marketing: How to get customers to sense, feel, think, act and relate to your company and brand*, Simon and Schuster: New York
- Van Noort, G., & Willemsen, L. M. (2012). Online damage control: The effects of proactive versus reactive webcare interventions in consumer-generated and brand-generated platforms. *Journal of Interactive Marketing*, 26(3), 131-140.
- Xu, C., Peak, D., & Prybutok, V. (2015). A customer value, satisfaction, and loyalty perspective of mobile application recommendations. *Decision Support Systems*, 79, 171-183.
- Yakhlef, A. (2015). Customer experience within retail environments: An embodied, spatial approach. *Marketing Theory*, 15(4), 545-564.
-