Clustering consumers' shopping journeys: eye tracking fashion m-retail

Zofija Tupikovskaja-Omovie and David Tyler
School of Fashion, Manchester Metropolitan University, Manchester, UK

Received 2 September 2019
Revised 19 December 2019
Accepted 12 February 2020

Abstract

Purpose – Despite the rapid adoption of smartphones among digital fashion consumers, their attitude to retailers' mobile apps and websites is one of increasing dissatisfaction. This suggests that understanding how mobile consumers use smartphones for fashion shopping is important in developing digital shopping platforms that fulfil consumer' expectations.

Design/methodology/approach – For this research, mobile eye-tracking technology was employed in order to develop unique shopping journeys for 30 consumers, using fashion retailers' websites on smartphones, documenting their differences and similarities in browsing and purchasing behaviour.

Findings – Based on scan path visualisations and observed shopping experiences, three prominent mobile shopping journeys and shopper types were identified: "directed by retailer's website", "efficient self-selected journey" and "challenging shopper". These prominent behaviour patterns were used to characterise mixed cluster behaviours; three distinct mixed clusters were identified, namely, "extended self-selected journey", "challenging shoppers directed by retailer's website" and "focused challenging shopper".

Research limitations/implications – This research argues that mobile consumers can be segmented based on their activities and behaviours on the mobile website. Knowing the prominent shopping behaviour types any other complex behaviour patterns can be identified, analysed and described.

Practical implications – The findings of this research can be used in developing personalised shopping experiences on smartphones by feeding these shopper types into retailers' digital marketing strategy and artificial intelligence (AI) systems.

Originality/value – This paper contributes to consumer behaviour literature by proposing a novel mobile consumer segmentation approach based on detailed shopping journey analysis using mobile eye-tracking technology.

Keywords Consumer behaviour, Mobile consumer, Fashion consumer behaviour, Consumer segmentation, Eye tracking, Shopping journey, Fashion retailing, Customer journey

Paper type Research paper

1. Introduction

With rapid adoption of smartphones, retailers have seen major shifts in consumer shopping behaviour, with more than half of e-commerce sales initiated via smartphones. Fashion is the most popular category bought online in the UK, and online sales of fashion account for 24% of total fashion spend in 2017 (Mintel, 2015). Digital users spend over 61% of shopping time using mobile devices, but only 45% of them are satisfied with retail mobile apps and websites (Euromonitor International, 2016). However, 80% of digital users expect mobile experiences to be "higher or equal to experience offered on the desktop website" (IBM, 2015). Retailers experience an increase in mobile traffic, but the conversion rate is still lower than on the desktop (Internet Retailing, 2016c). The majority of mobile consumers are dissatisfied with retail mobile apps and websites, as they encounter various issues when shopping via smartphones. The most affected companies are those operating in digital-only environments, as digital space is the only touch point with their customers.

The field of m-retail is attracting interest from researchers, but many use traditional marketing tools and concepts developed from high street retailing. This research study makes use of tools that have only recently become available, together with the willingness to question received wisdom on market segmentation.

Journal of Fashion Marketing and Management: An International Journal

1361-2026
DOI 10.1108/JFMM-09-2019-0195

2. Literature review

As m-commerce has been analysed often from a perspective of an extension of e-commerce, mobile consumer segmentation models are adopted from the same source (Zhang *et al.*, 2013). Another possible perspective to research m-commerce is as a unique segment of e-commerce with fundamentally different interaction modalities and features which are not available in the traditional e-commerce environments (Kourouthanassis and Giaglis, 2012; Pantano and Priporas, 2016). This study takes an open stance towards mobile consumer research in order to explore potential m-retail strategies for consumer acquisition and conversion marketing. Retailers are relying on digital analytics data, and adopting existing models and theories is no longer realistic as mobile is changing the ways users behave. Therefore, identifying novel methodologies for analysing mobile consumer behavioural habits on smartphones and predicting future behaviour patterns based on consumer data are required. An overview of previous studies showed that research in the area of mobile marketing has been explored from the perspective of businesses, rather than that of consumers (Büyüközkan, 2009; Davis and Chaudhri, 2012; Huang, 2011, 2012; Pantano, 2016; Scharl *et al.*, 2005).

Previous studies have analysed differences in mobile usage (Sinisalo and Karjaluoto, 2009; Zhang and Juhlin, 2016), influences on purchase intention (Bellman *et al.*, 2011; Newman *et al.*, 2018), mobile shopping acceptance (Marriott *et al.*, 2017), major consumers' motivations to use the mobile shopping channel (Grant and O'Donohoe, 2007; Yang and Kim, 2012; Parker and Wang, 2016) and behavioural intentions towards mobile shopping (Gao *et al.*, 2010, 2012; Bellman *et al.*, 2011; Wells *et al.*, 2012; Holmes *et al.*, 2013). Others have analysed m-commerce usage activities in relation to demographics and motivations (Chong, 2013), gender, convenience (Okazaki and Mendez, 2013) and decision-making process (Holmes *et al.*, 2013). In order to maintain consumers' interest, "retailers, digital marketers and website developers have to understand new consumer types" (Tupikovskaja-Omovie *et al.*, 2014) and their experiences using mobile devices for fashion shopping (Pantano and Priporas, 2016; Blazquez Cano *et al.*, 2017).

2.1 Customer journey mapping

Customers have a vast range of shopping channel options to individualise their customer journey (Barwitz and Maas, 2018). Customer journeys are presented as a lens for "seeing services as people do" (Parker and Heapy, 2006). Marketing professionals agree that customer journeys are becoming increasingly important elements of consumer behaviour research (Zomerdijk and Voss, 2011) and appraise an effective customer journey design as an important approach in understanding consumer behaviour (Kuehnl *et al.*, 2019). Within the field of marketing, customer journey approach focuses on consumers' decision processes (Lee, 2010) and individual service experiences in a multichannel environment (Halvorsrud *et al.*, 2016). Marketing professionals analyse customer journey following a predefined approach, based on awareness, familiarity, consideration, purchase and loyalty (Court *et al.*, 2009; Farah *et al.*, 2019). Another customer journey model often used in marketing field is pre-purchase, purchase and post-purchase experiences and behaviour (Lemon and Verhoef, 2016; Voorhees *et al.*, 2017). These models are often used as a basis for understanding the impact of digital strategies on consumer decision-making process (Dasgupta and Grover, 2019).

Customer journey maps are useful visualisation techniques to represent the flow of unfolding customer experiences (Halvorsrud *et al.*, 2016; Moon *et al.*, 2016). According to Følstad and Kvale (2018), customer journeys allow to take the viewpoint of the customer, and, more importantly, to reach insight into customers' shopping experiences. Recent studies attempted to extend an existing conceptual customer journey framework to visually map purchase stages (Rudkowski *et al.*, 2020).

It was identified that customer journey is a relatively immature field of study (Følstad and Kvale, 2018), and there is limited research about what happens during the actual purchasing

stage. Some researchers reconstructed individual customer journey maps based on data from interviews, diary studies and process tracking from back-end systems (Halvorsrud *et al.*, 2016). Others used clickstream data provided by online advertisers in collaboration with multichannel tracking provider (Anderl *et al.*, 2016). More commonly, participants reconstructed their own last customer journey (Herhausen *et al.*, 2019). These methods of data collection could be problematic as the frameworks used are often based on generic touch points derived from focus groups (Vakulenko *et al.*, 2019) or previous literature (Lemon and Verhoef, 2016; Voorhees *et al.*, 2017), but are not based on actual elements and features of the website consumers interact with. Although some studies attempted to investigate the path to purchase (Cortinas *et al.*, 2019), but the research using simulated websites limits the possibility to analyse the actual experiences during the shopping journey. Therefore, this paper aims to fill this gap by documenting actual customer experiences on real fashion retailers' mobile websites.

2.2 Eye-tracking research in fashion mobile retail

Fashion websites and advertisement on mobile devices have been analysed using static eye trackers in the form of static pictures, manipulating elements of the website (Chae, 2016; Huang and Kuo, 2011; Ho, 2014; Wang *et al.*, 2014) or simulated websites as stimuli in experimental design with eye-tracking technology (Cortinas *et al.*, 2019). Empirical studies suggest that multichannel retailers can enhance consumers' shopping experiences by providing alternative digital shopping formats (Wagner *et al.*, 2020) with a unified shopping experience (Savastano *et al.*, 2019), as consumers expect the same retailer's mobile app and website to offer the same shopping experience (Tupikovskaja-Omovie *et al.*, 2015; Tupikovskaja-Omovie, 2018). The investigation of stimulus from dynamic environments during the actual shopping process online is limited (Huddleston *et al.*, 2015; Tupikovskaja-Omovie and Tyler, 2018, 2019; Tupikovskaja-Omovie *et al.*, 2015). Furthermore, the majority of previous eye tracking studies analysing fashion websites excluded the payment stage (Benn *et al.*, 2015; Djamasbi *et al.*, 2010a, b; Gidlof *et al.*, 2012; Guo *et al.*, 2015), which can reveal crucial usability issues of the retailer's website as well as how mobile consumers approach payment on smartphones (Tupikovskaja-Omovie and Tyler, 2018). Therefore, this paper aims to analyse and segment mobile consumers' browsing and purchasing shopping journeys. This research study will answer the following research question: What are the patterns of mobile consumers' browsing and purchasing behaviour in fashion m-retail?

3. Methodology

Eye-tracking technology was used in this research to record fashion consumers' behaviour on smartphones while browsing and shopping on fashion retailers' websites. In order to ensure the same conditions for all participants and eliminate any bias during the data collection, all participants of this research study were given the same smartphone, iPhone 8, connected to the same Wi-Fi. This paper analyses consumer behaviour on two fashion retailers' websites on smartphones. A major retailer of fashion leisurewear was involved in the first part of this research, and is anonymised for the analysis. In this paper, this fashion leisurewear company is called the fashion retailer R-A. Its current online business has over 310K unique users per year, and over 52% of them use smartphones to access the website. The second part of this research explores a major high street fashion retailer's website; this retailer is anonymised as fashion retailer R-B.

After consultation with the fashion retailers' R-A and R-B customer databases, it was established that the majority of the retailers' customers use iPhones for shopping on their website. Therefore, participants were recruited and selected based on the following criteria: own an iPhone and have experience with shopping on smartphones on the fashion retailer's

website. A total of 14 participants successfully completed the study with retailer's R-A website on smartphone, aged 18–34 years old. Half of them identified as females, and 50% as males (Table 1). All of these participants were working adults, and they were given a promotional voucher code for the retailer's website as an incentive to join this study.

For the second eye-tracking study with fashion retailer's R-B website, a total of 16 female participants aged 18–34 years old took part in this research. All of these participants were working adults, and none of them were incentivised to join this research.

All the participants had prior experience of the retailers' websites accessed, making them regular customers. This allowed to eliminate any bias in comparing and triangulating the findings from both eye-tracking studies with the retailer' R-A and R-B websites. Although the participants of the eye-tracking study with retailer's R-A website were incentivised while those with R-B were not, all these participants were existing customers of the retailer under study and were visiting the website they knew already. These both data sets proved that in either study, the incentive did not influence the shopping experiences of the participants, as both samples exhibited the same level of engagement with the retailer's website in terms of time spent and state of flow.

All the participants browsed the same fashion retailer's website using the same smartphone. The participants were provided with a set budget of £55 (max) and instructed to purchase up to two items from the fashion retailer's website. For the purpose of this research, a natural and an unobtrusive interaction with retailer's website on a smartphone was required. In order to achieve this mobile eye tracking, glasses were employed to record users' interactions with the stimulus (the fashion retailer's mobile website). This allowed the participants to hold the smartphone in the way they were feeling the most comfortable with; also, they were able to sit comfortably in any position and posture they chose. SMI Eye Tracking Gasses 2.0 with smartphone-based recorder by SensoMotoric Instruments were used for this research as this eye-tracking kit is a light-weight spectacle type which does not limit users' freedom. This allowed for the most natural settings for data collection.

4. Analysis and results

For the purpose of this research, SMI BeGaze 3.7 software was used to extract the data files from the eye-tracking experiments recorded with the mobile eye-tracking glasses. A number of different data files were gathered during eye-tracking experiments for this research; majority of them are video-based data files. The scan path eye-tracking data files were used to

Table 1.
Sample description of the first eye-tracking study with fashion retailer's R-A website (P101, P102. . . P114 – participant number, F – female, M – male)

Participant	Gender	Browser
P101	F	Safari
P102	F	Google App
P103	F	Safari
P104	F	Safari
P105	F	Google App
P106	M	Chrome
P107	M	Safari
P108	M	Safari
P109	M	Chrome
P110	F	Safari
P111	M	Safari
P112	M	Google App
P113	M	Safari
P114	F	Chrome and Safari

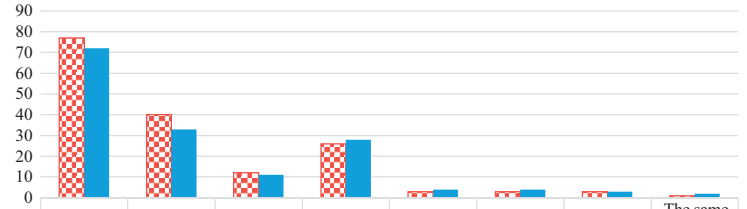
develop shopping journeys for each participant. These shopping journeys account for each step in the user's journey and go beyond merely counting clicks (Tupikovskaja-Omovie and Tyler, 2018). These shopping journeys record where the participants were looking at even if they did not click on anything there. Such important elements of the browsing experience as checking customer reviews or suggested products were logged into these shopping journeys, as well as filtering options these users were selecting. All shopping journeys were recorded with users who had prior experience with the retailer's website on their smartphones and were familiar with the features and layout of the website. The same level of prior experience allowed to compare and triangulate the findings from eye-tracking studies with the retailer's R-A and R-B websites, increasing the validity and reliability of the findings.

4.1 Females versus males comparison – digital fashion consumer behaviour

Having an even gender split of the sample for the retailer R-A, it was possible to compare female versus male behaviour differences on the website. The data gathered during eye-tracking experiments as well as information logged from each shopping journey were aggregated into individual tables. These data were further processed to calculate the average numbers of steps on the homepage, browsing, on product pages and at the checkout, the average numbers of product pages visited and the average number of products added to the basket for a sample of females and males (Figure 1). Surprisingly, in regards to browsing behaviour and numbers of steps conducted by users on smartphones, both females and males performed relatively similar activities. These findings suggest that the gender is not the key criterion for differentiation between mobile fashion consumers, and deeper understanding of their behaviour is required in order to segment these users into meaningful and useful clusters for retailers' use.

4.2 Clustering mobile fashion consumers' shopping journeys

Therefore, this research study focused on behaviour analysis, irrespective of gender. The aim was to compare all 30 shopping journeys developed for each participant for heterogeneity of behaviour patterns. The initial analysis was conducted using visual examination of these shopping journeys for potential similarities in patterns. All descriptive information about participants' browsing and purchasing activities was recorded in observation notes. Following this detailed analysis of shopping journeys, further clustering was conducted to seek out similar behaviour types. This analysis resulted in identifying three prominent shopping journey types and three mixed clusters (Table 2). Using the most distinct examples



	Total number of steps	Number of steps in browsing	Number of steps on product pages	Number of steps at the checkout	Number of product pages visited	Number of unique product pages	Number of products added to the basket	The same product added to the basket twice
F	77	40	12	26	3	3	3	1
M	72	33	11	28	4	4	3	2

Figure 1.
Comparison of gender differences based on numbers of steps on the fashion retailer's R-A website (F–females, M–males)

of these behaviour types, other participants of this study were allocated accordingly to one of these three organic or mixed clusters.

The majority of mobile fashion consumers' shopping journeys showed that almost half of the participants behave in a specific way – these consumers were allocated to Cluster I. The second most common behaviour pattern was observed among eight participants of this study – these were grouped in Cluster II. The third organic group, Custer III, has been recorded with 3 participants. These three prominent shopper types are presented in further sections of this paper (Sections 4.3.1., 4.3.2. and 4.3.3.). Three mixed clusters, Clusters IV, V and VI, are described based on the characteristics of the shopper types of the Clusters I, II and III (Sections 4.4.1., 4.4.2. and 4.4.3.).

4.3 Prominent shopping behaviour clusters

4.3.1 Cluster I–directed by retailer's website. Fashion shopper journey type in Cluster I can be described as "*directed by retailer's website*" (Figure 2). The participants displaying this type of shopper journey followed the default website layout and viewed search results as displayed on the website in its default version. These shoppers mainly use Menu and categories on the retailer's website as the way to find desired fashion products to purchase. They select the product type within the categories from the Menu, and then browse through the search

Table 2. Clustering mobile fashion consumers' shopping journeys

		Prominent Clusters			Mixed Clusters		
Retailer	Participant	I	II	III	IV	V	VI
R-A	P101		✓				
	P102						✓
	P103				✓		
	P104				✓		
	P105		✓				
	P106	✓					
	P107		✓				
	P108			✓			
	P109	✓					
	P110	✓					
	P111					✓	
	P112	✓					
	P113	✓					
	P114		✓				
R-B	P201	✓					
	P202			✓			
	P203		✓				
	P204	✓					
	P205		✓				
	P206		✓				
	P207	✓					
	P209	✓					
	P301	✓					
	P302			✓			
	P303						✓
	P304				✓		
	P305					✓	
	P306		✓				
	P307	✓					
	P309	✓					
Total	30	12	8	3	3	2	2

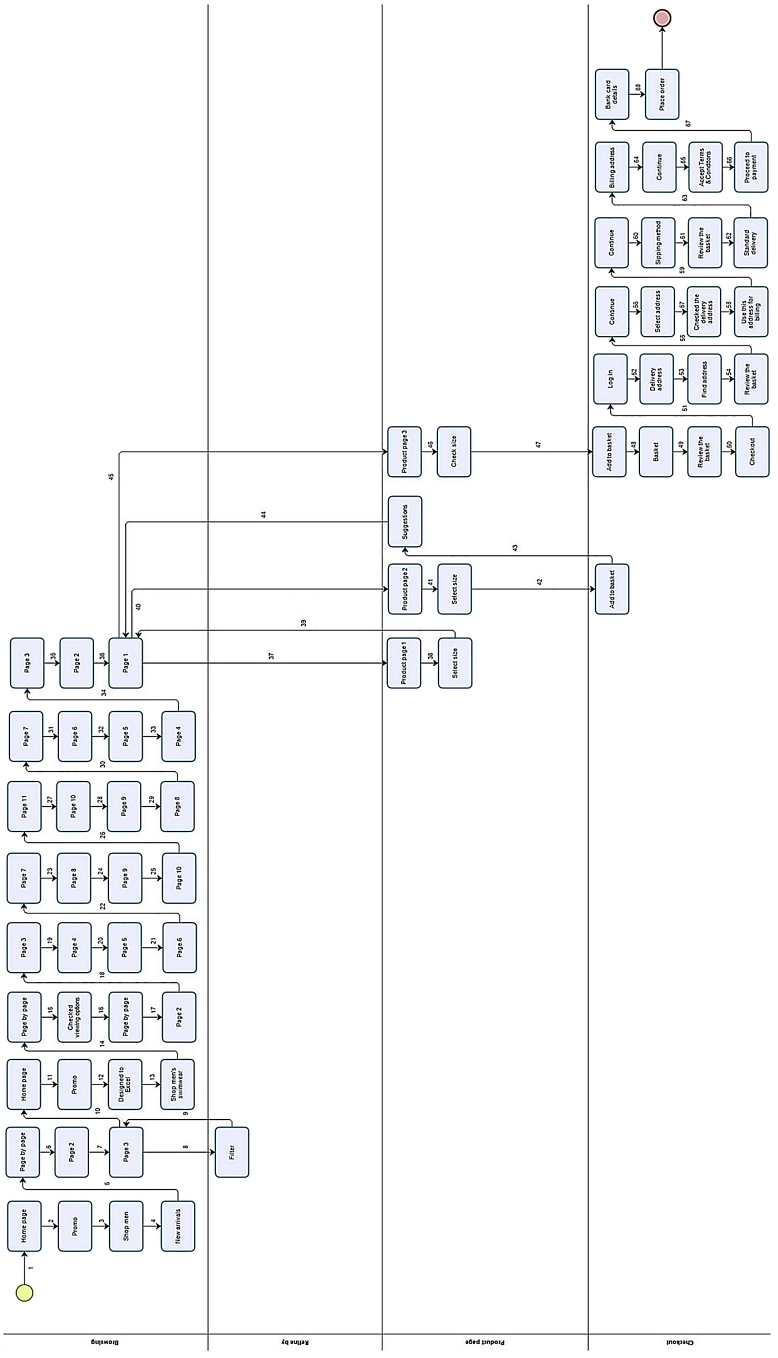


Figure 2.
Shopping journey example of the Cluster I (P106)

results in the category by viewing all products page by page, without changing the display of the search results. They did not use any of the options to change the number of products displayed per page, but just followed this pre-set environment. These shoppers wanted to check all available products of the selected category; therefore, they scrolled through all search results pages, from page 1 till the last page. In some cases, there were 12 search results pages, and in some up to 26 pages; these users felt they had to click through the entire collection of products in the category to avoid missing good products. Therefore, these users clicked through pages 1 to 12, and then back through pages 12 to 1, until they saw the product that captured their attention earlier. Although their browsing experience seems prolonged, they were able to select desired products very quickly after viewing all available products. Therefore, the actual decision-making process was easy and smooth. In total, 12 out of 30 participants were allocated to the Cluster I, and this type of behaviour has been identified as the most common browsing pattern.

4.3.2 Cluster II – efficient self-selected journey. Fashion shopper type of the second cluster displayed the most *"efficient self-selected journey"* (Figure 3). These users have a very clear idea about what product(s) they are looking for and are exceptionally focused in achieving their shopping goals. These users have preferred ways of browsing; they change the display settings to create a more personalised shopping experience. They use a variety of available filters by combining several filtering options in order to find their desired products quicker. Some of these users were more fashion-driven, and they liked to see the most popular products in the category by applying the sorting option. The search results were presented in "page by page" view in the default version of the retailer's website, but it did not match these users' preferences. These users always change the default version of the retailer's website to be able to view all products in one long page. A total 8 out of 30 participants behaved in this way, suggesting that this browsing behaviour pattern is the second most common way of shopping on smartphones.

4.3.3 Cluster III – challenging shopper. Although the Cluster III had only three participants grouped, their browsing behaviour is very distinct from the two previous clusters. The users from the Cluster III are the most *"challenging shoppers"* (Figure 4) because they are unable to decide quickly. These customers hardly use any of the filtering options available; they only made use of menu categories as the means to find desired products. They spend a lot of time browsing and view many more product pages than users from Clusters I and II. What is most significant with these challenging users is that they view the same products several times. This is mainly due to the need to compare not only the different products, but also different colours of these products.

4.4 Mixed clusters

Following a detailed analysis of all shopping journeys, it became apparent that not all users can be assigned to one of the three prominent clusters, Clusters I, II and III, described above. Most importantly, some users have more complex behaviour patterns than others, prompting the idea of mixed clusters. Although a total 7 out of 30 participants exhibited one of the mixed cluster behaviour patterns, these users might represent an important consumer target for retailers dependent of their spending power. Therefore, the following sections will describe their behaviour characteristics using the parameters from Clusters I, II and III.

4.4.1 Cluster IV – extended self-selected journey. The major behaviour pattern within the mixed cluster category is Cluster IV, which groups users who exhibited *"extended self-selected journey"* accounting for 3 out of 7 fashion consumers. These users applied "refine" function when browsing, but not as actively as the Cluster II. Refining is rather an occasional approach towards the second half of the shopping journey, which is applied when ordinary "Menu" categories do not deliver the desired results. These users are quite similar to Cluster I as they

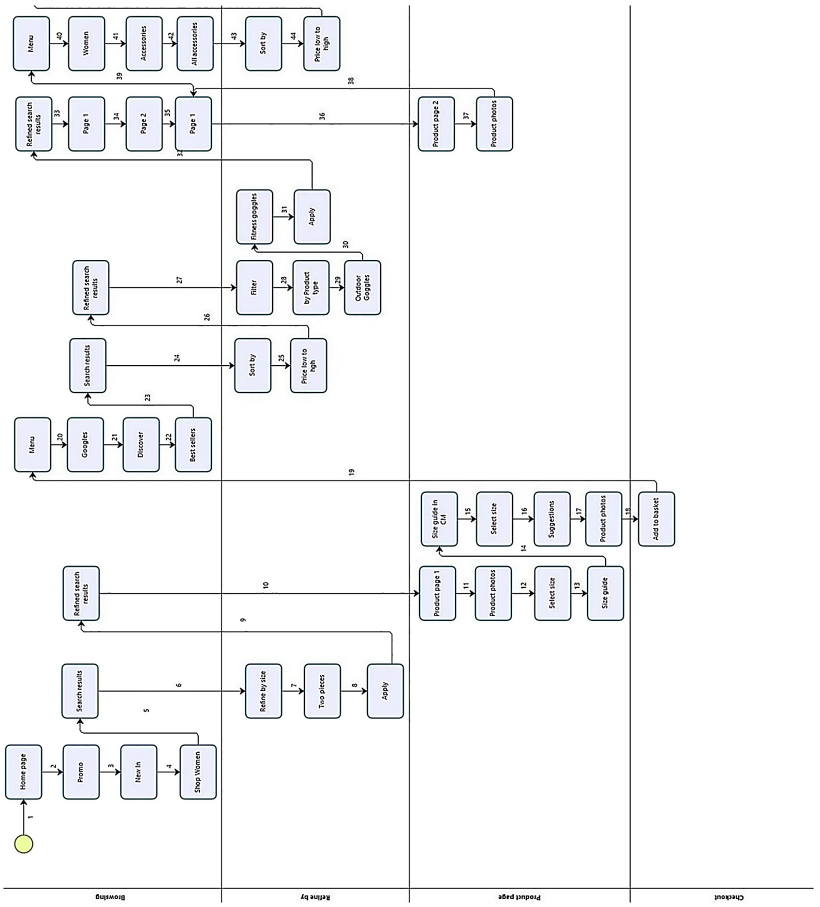


Figure 3.
Shopping journey example of the Cluster II (P101)

JFMM

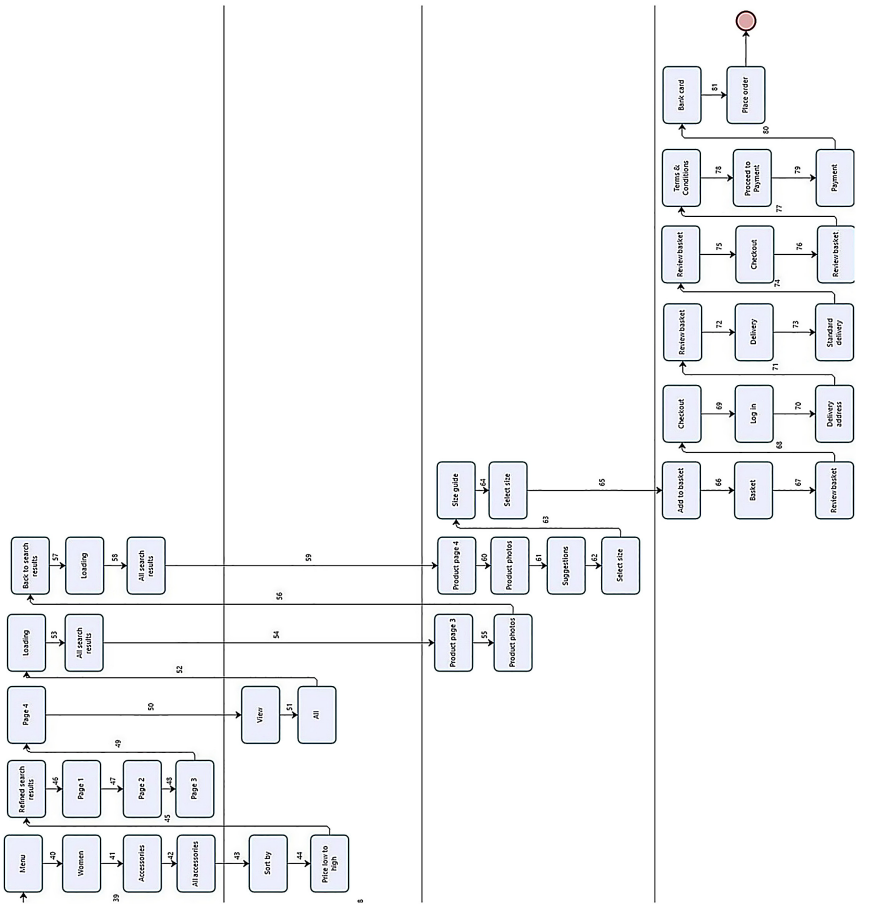


Figure 3.

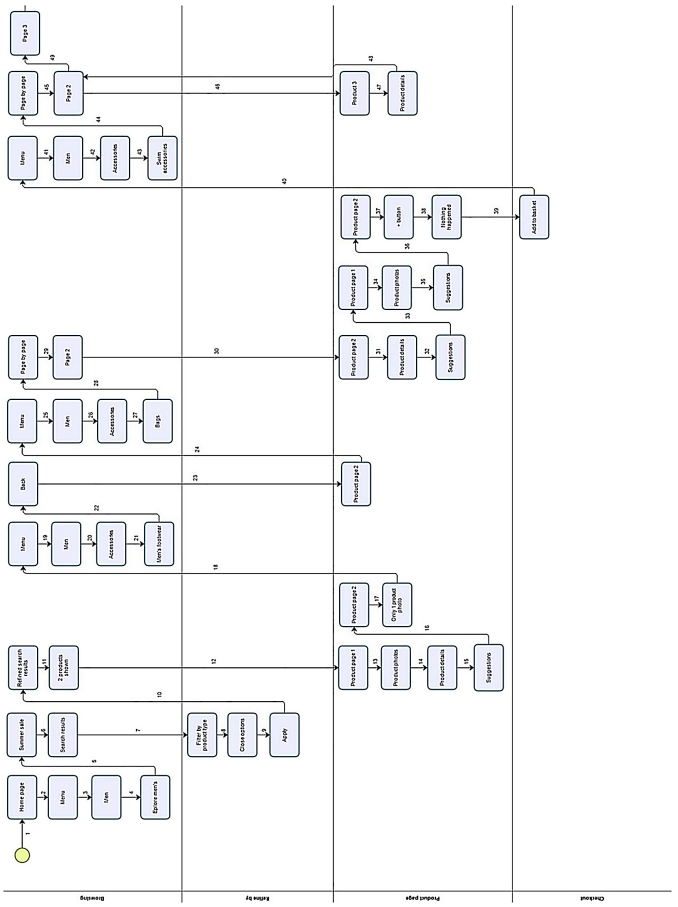


Figure 4.
Shopping journey example of the Cluster III (P108)

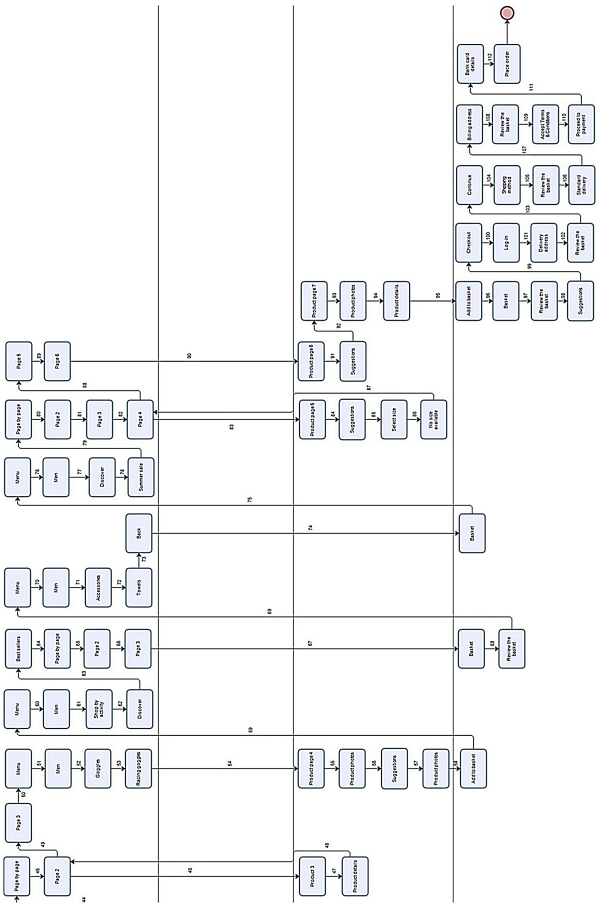


Figure 4.

tend to view all available products within the search results in order not to miss anything useful. Furthermore, even the refined search results are viewed with a great attention and scrutiny.

4.4.2 Cluster V – challenging shopper directed by retailer's website. This consumer group represents the most struggling fashion consumers, who are *"challenging shoppers directed by retailer's website"*. These users combine the attributes of the Clusters I and III. They try to view as many products as possible going from page 1 all the way to the final page of search results, but then find it difficult to recall all the products seen. Therefore, these users have to go back and forth viewing the same products several times. These users would benefit from a clear section on the website displaying "previously viewed products", which would make their browsing experiences more satisfying and efficient.

4.4.3 Cluster VI – focused challenging shopper. "Focused challenging shopper" displayed rather quite unique behaviour pattern, which is similar to Clusters II and III. These users use "refine" function consistently in order to find desired products, often relying on social influences, looking at "best-selling" products and customer reviews. As these challenging shoppers struggle to make their decisions quickly, they develop a unique strategy to ease their browsing experiences. These users add many products to the basket to help them compare and choose.

5. Discussion

Customer segmentation is often based on demographics and reported usage activities. Digital consumer segmentation has been based on Internet usage, perceived risks, website attributes, intent to do online purchase in future, preference for website attributes (Mathew, 2016), recalled reach and frequency of exposure to the touch points (Ieva and Ziliani, 2018) and patterns of medium preference for loyalty programmes accompanied by socio-demographics (Ieva and Ziliani, 2017). Within the mobile consumer group, researchers are looking for new segmentation approaches which would more directly reflect actual customer activities on smartphones. Examples include the purchase rate, lifetime duration, average spending estimated from purchase history data (Morisada *et al.*, 2019) and the perspectives of the usage of the network and the usage of content services (Hamka *et al.*, 2014). Recent study on multichannel retailing identified that consumers exhibit certain homogeneity but also considerable heterogeneity in their customer journeys reconstructed based on participants' described shopping-related goals (Harris *et al.*, 2018). Multichannel fashion retailers have seen shifts in consumer shopping behaviour, and current shoppers are avid mobile users. In all, 77% of fashion consumers use their phones for browsing fashion and 68% use smartphones to buy fashion (Drapers, 2019). When m-retail becomes the dominant platform, segmentation of the consumer base, shopping journeys and customer experience become vital for retailers.

The rise of mobile devices brings significant changes into existing customer segments (Herhausen *et al.*, 2019), and this knowledge is critical in developing a successful multichannel customer marketing and management strategy (De Keyser *et al.*, 2015). Furthermore, retailers need to focus on omnichannel marketing to integrate all channels available to create a seamless shopping experience (Tupikovskaja-Omovie *et al.*, 2015) that increases convenience and engagement during the customer journey (Mosquera *et al.*, 2017). Fashion retailers acknowledge that getting the mix right is important for different groups of customers, and focusing on convenience has become a significant priority. Recognising that there are different shopping customer journey types, all of them need an easy path through the website to achieve their shopping goals. Fashion retailers can use the segmentation developed in this research to enhance existing marketing strategy by offering customised shopping experiences on their websites. Different users will make more use of certain features of the website, and redesigning the website accordingly can make those features more accessible to

their customers. The use of AI becomes more meaningful, and fashion retailers could link customer journey types with relevant suggestions and customisation to offer users helpful support. Furthermore, retailers knowing what shopping journey type is the most common among their customers can prioritise their marketing strategy accordingly. Online retailers can benefit from applying these shopping journey types to analyse their existing digital analytics database. Fashion retailers might be missing out if they do not respond to shopping journeys of different types because their customers' shopping experiences are adversely affected. The research into mobile consumer segmentation within fashion e-commerce is limited. This paper has proposed an innovative approach to segmenting mobile fashion consumers based on actual digital user behaviour using mobile eye-tracking data.

6. Conclusions

This research suggests that gender differences may be irrelevant when shopping via mobile devices. Conducting eye-tracking studies with existing retailers' customers allowed to identify major issues of these websites and proposed the best strategy for improvement. This information might be useful when thinking how to improve user experience, gain additional sales, attract new customers and improve shopping experience to keep existing customers.

Depending on the individual's goals and decisiveness, mobile consumers display three prominent and distinct types of shopping behaviours, which can be applied in understanding more complex shopping behaviour patterns. These different approaches have implications for mobile app and website design. It would be useful to explore these shopper behaviours on other retailers' mobile websites and to investigate if these proposed types of browsing are constant to the same digital user or adaptable depending on the situation and need.

The three shopping journey types identified in this research can be further validated by extending the sample size for analysis. There is a need to verify if these shopping behaviours are applicable equally to females and males. The knowledge developed during this research study can be applied in granulating the retailer's digital customer profiles by merging the data based on personality traits, budget, lifestyle and product preferences with shopping behaviour types and browsing styles. Knowing prominent shopping behaviour types any other complex behaviour patterns can be identified, analysed and characterised. The understanding of mobile consumer types can be applied by fashion retailers in developing AI frameworks, enhancing personalisation and implementing marketing strategy. When guided by this knowledge, the retailers' digital and marketing teams will be able to better target their customers and offer a personalised shopping experience satisfying digital consumer' needs.

References

Anderl, E., Becker, I., von Wangenheim, F. and Schumann, J.H. (2016), "Mapping the customer journey: lessons learned from graph-based online attribution modelling", *International Journal of Research in Marketing*, Vol. 33 No. 3, pp. 457-474.

Barwitz, N. and Maas, P. (2018), "Understanding the omnichannel customer journey: determinants of interaction choice", *Journal of Interactive Marketing*, Vol. 43, pp. 116-133.

Bellman, S., Potter, R.F., Treleaven-Hassard, S., Robinson, J.A. and Varan, D. (2011), "The effectiveness of branded mobile phone apps", *Journal of Interactive Marketing*, Vol. 25 No. 4, pp. 191-200.

Benn, Y., Webb, T., Chang, B.P.I. and Reidy, J. (2015), "What information do consumers consider, and how do they look for it, when shopping for groceries online?", *Appetite*, Vol. 89 No. 1, pp. 265-273.

Blazquez Cano, M., Perry, P., Ashman, R. and Waite, K. (2017), "The influence of image interactivity upon user engagement when using mobile touch screens", *Computers in Human Behavior*, Vol. 77, pp. 406-412.

Büyüközkan, G. (2009), "Determining the mobile commerce user requirements using an analytic approach", *Computer Standards and Interfaces*, Vol. 31 No. 1, pp. 144-152.

Chae, J.M. (2016), "The effect of mobile fashion shopping characteristics on consumer's purchase intention", *Fashion and Textile Research Journal*, Vol. 18 No. 1, pp. 38-47.

Chong, A.Y.-L. (2013), "Mobile commerce usage activities: the roles of demographic and motivation variables", *Technological Forecasting and Social Change*, Vol. 80 No. 7, pp. 1350-1359.

Cortinas, M., Cabeza, R., Chocarro, R. and Villanueva, A. (2019), "Attention to online channels across the path to purchase: an eye-tracking study", *Electronic Commerce Research and Applications*, Vol. 36, p. 100864.

Court, D., Elzinga, D., Mulder, S. and Vetvik, O.J. (2009), "The consumer decision journey", *McMinsey Quarterly*, June, available at: www.mckinsey.com/insights/marketing_sales/the_consumer_decision_journey.

Dasgupta, S. and Grover, P. (2019), "Impact of digital strategies on consumer decision journey: special", *Academy of Marketing Studies Journal*, Vol. 23 No. 1, pp. 1-14.

Davis, R. and Chaudhri, A.A. (2012), "Conceptualizing play in mobile commerce environments", *International Journal of Mobile Marketing*, Vol. 7 No. 2, pp. 65-77.

De Keyser, A., Schepers, J. and Konus¸, U. (2015), "Multichannel customer segmentation: does the aftersales channel matter? A replication and extension", *International Journal of Research in Marketing*, Vol. 32 No. 4, pp. 453-456.

Djamasbi, S., Marisa, S. and Tom, T. (2010a), "Generation Y, web design, and eye tracking", *International Journal of Human-Computer Studies*, Vol. 68 No. 5, pp. 307-323.

Djamasbi, S., Marisa, S., Tom, T. and Dai, R. (2010b), "Efficiency, trust, and visual appeal: usability testing through eye tracking", *Proceedings of the 43rd Hawaii International Conference on System Sciences*, IEEE.

Drapers (2019), "*Gen Z and millenials*", Drapers Online, available at: https://www.drapersonline.com/business-operations/special-reports/gen-z-and-millennials/7035593.article (accessed 01 May 2019).

Euromonitor International (2016), "Mobile Phones in the United Kingdom. Euromonitor International from official statistics, trade associations, trade press, company research, store checks, trade interviews, trade sources", available at: http://www.portal.euromonitor.com.ezproxy.mmu.ac.uk/portal/analysis/related (accessed 5 April 2016).

Farah, M.F., Ramadan, Z.B. and Harb, D.H. (2019), "The examination of virtual reality at the intersection of consumer experience, shopping journey and physical retailing", *Journal of Retailing and Consumer Services*, Vol. 48, pp. 136-143.

Følstad, A. and Kvale, K. (2018), "Customer journeys: a systematic literature review", *Journal of Service Theory and Practice*, Vol. 28 No. 2, pp. 196-227.

Gao, T., Rohm, A.J., Sultan, F. and Huang, S. (2012), "Antecedents of consumer attitudes toward mobile marketing: a comparative study of youth markets in the United States and China", *Thunderbird International Business Review*, Vol. 54 No. 2, pp. 211-224.

Gao, T., Sultan, F. and Rohm, A.J. (2010), "'Factors influencing Chinese youth consumers' acceptance of mobile marketing", *Journal of Consumer Marketing*, Vol. 27 No. 7, pp. 574-583.

Gidlof, K., Holmberg, N. and Sandberg, H. (2012), "The use of eye-tracking and retrospective interviews to study teenagers exposure to online advertising", *Visual Communication*, Vol. 11 No. 3, pp. 329-345.

Grant, I. and O'Donohoe, S. (2007), "Why young consumers are not open to mobile marketing communication", *International Journal of Advertising*, Vol. 26 No. 2, pp. 223-246.

Guo, F., Cao, Y., Ding, Y., Liu, W. and Zhang, X. (2015), "A multimodal measurement method of users emotional experiences shopping online", *Human Factors and Ergonomics in Manufacturing and Service Industries*, Vol. 25 No. 5, pp. 585-598.

Halvorsrud, R., Kvale, K. and Følstad, A. (2016), "Improving service quality through customer journey analysis", *Journal of Service Theory and Practice*, Vol. 26 No. 6, pp. 840-867.

Hamka, F., Bouwman, H., de Reuver, M. and Kroesen, M. (2014), "Mobile customer segmentation based on smartphone measurement", *Telematics and Informatics*, Vol. 31 No. 2, pp. 220-227.

Harris, P., Dall'Olmo Riley, F. and Hand, C. (2018), "Understanding multichannel shopper journey configuration: an application of goal theory", *Journal of Retailing and Consumer Services*, Vol. 44, pp. 108-117.

Herhausen, D., Kleinlercher, K., Verhoef, P.C., Emrich, O. and Rudolph, T. (2019), "Loyalty formation for different customer journey segments", *Journal of Retailing*, Vol. 95 No. 3, pp. 9-29.

Ho, H. (2014), "The effects of controlling visual attention to handbags for women in online shops: evidence from eye movements", *Computers in Human Behaviour*, Vol. 30 No. 1, pp. 146-152.

Holmes, A., Byrne, A. and Rowley, J. (2013), "Mobile shopping behaviour: insights into attitudes, shopping process involvement and location", *International Journal of Retail and Distribution Management*, Vol. 42 No. 1, pp. 25-39.

Huang, Y. and Kuo, F. (2011), "An eye-tracking investigation of internet consumers' decision deliberateness", *Internet Research*, Vol. 21 No. 5, pp. 541-561.

Huang, R.Y. (2011), "Value, interest and power: a three dimensional model for mobile marketing stakeholder analysis", *International Journal of Mobile Marketing*, Vol. 6 No. 1, pp. 109-119.

Huang, R.Y. (2012), "The identification, ranking and categoriICT of mobile marketing success factors", *International Journal of Mobile Marketing*, Vol. 7 No. 2, pp. 86-97.

Huddleston, P., Behe, B.K., Minahan, S. and Fernandez, R.T. (2015), "Seeking attention: an eye tracking study of in-store merchandise displays", *International Journal of Retail and Distribution Management*, Vol. 43 No. 6, pp. 561-574.

IBM (2015), *Customer Experience Management in the New Era of Mobility. The Business Case for Understanding and Optimizing Your Mobile Customer Experience Today*, IBM Customer Analytics.

Ieva, M. and Ziliani, C. (2017), "Towards digital loyalty programs: insights from customer medium preference segmentation", *International Journal of Retail and Distribution Management*, Vol. 45 No. 2, pp. 195-210.

Ieva, M. and Ziliani, C. (2018), "Mapping touchpoint exposure in retailing: implications for developing an omnichannel customer experience", *International Journal of Retail and Distribution Management*, Vol. 46 No. 3, pp. 304-322.

Internet Retailing (2016), "*Online sales grow by 11% in March as smartphone sales double*", Internet Retailing, available at: http://internetretailing.net/2016/04/online-sales-grew-11-march-15-firstquarter/ (accessed 18 April 2016).

Kourouthanassis, P.E. and Giaglis, G.M. (2012), "Introduction to the special issue mobile commerce: the past, present, and future of mobile commerce research", *International Journal of Electronic Commerce*, Vol. 16 No. 4, pp. 5-18.

Kuehnl, C., Jozic, D. and Homburg, C. (2019), "Effective customer journey design: consumers' conception, measurement, and consequences", *Journal of the Academy of Marketing Science*, Vol. 47 No. 3, pp. 551-568.

Lee, G. (2010), "Death of 'last click wins': media attribution and the expanding use of media data", *Journal of Direct, Data and Digital Marketing Practice*, Vol. 12 No. 1, pp. 16-26.

Lemon, K.N. and Verhoef, P.C. (2016), "Understanding customer experience throughout the customer journey", *Journal of Marketing*, Vol. 80 No. 6, pp. 69-96.

Marriott, H.R., Williams, M.D. and Dwivedi, Y.K. (2017), "What do we know about consumer mshopping behaviour?", *International Journal of Retail and Distribution Management*. Vol. 45 No. 6, pp. 568-586.

Mathew, P.M. (2016), "Attitude segmentation of Indian online buyers", *Journal of Enterprise Information Management*, Vol. 29 No. 3, pp. 359-373.

Mintel (2015), "Mobile phones–UK–april 2015.', lightspeed GMI/mintel", available at: http://academic.mintel.com.ezproxy.mmu.ac.uk/display/735534/(accessed 19 April 2016).

Moon, H., Han, S.H., Chun, J. and Hong, S.W. (2016), "A design process for a customer journey map: a case study on mobile services", *Human Factors and Ergonomics in Manufacturing & Service Industries*, Vol. 26 No. 4, pp. 501-514.

Morisada, M., Miwa, Y. and Dahana, W.D. (2019), "Identifying valuable customer segments in online fashion markets: an implication for customer tier programs", *Electronic Commerce Research and Applications*, Vol. 33, p. 100822.

Mosquera, A., Olarte Pascual, C. and Juaneda Ayensa, E. (2017), "Understanding the customer experience in the age of omni-channel shopping", *Revista ICONO14 Revista cient_ıfica de Comunicaci_on y Tecnolog_ıas emergentes*, Vol. 15 No. 2, pp. 92-114.

Newman, C.L., Wachter, K. and White, A. (2018), "Bricks or clicks? Understanding consumer usage of retail mobile apps", *Journal of Services Marketing*, Vol. 3 No. 2, pp. 211-222.

Okazaki, S. and Mendez, F. (2013), "Exploring convenience in mobile commerce: moderating effects of gender", *Computers in Human Behavior*, Vol. 29 No. 3, p. 1234.

Pantano, E. (2016), "Benefits and risks associated with time choice of innovating in retail settings", *International Journal of Retail and Distribution Management*, Vol. 44 No. 1, pp. 58-70.

Pantano, E. and Priporas, C. (2016), "The effect of mobile retailing on consumers' purchasing experiences: a dynamic perspective", *Computers in Human Behavior*, Vol. 61, pp. 548-555.

Parker, S. and Heapy, J. (2006), *The Journey to the Interface: How Public Service Design can Connect Users to Reform*, Demos, London.

Parker, C.J. and Wang, H. (2016), "Examining hedonic and utilitarian motivations for m-commerce fashion retail app engagement", *Journal of Fashion Marketing and Management: International Journal*, Vol. 20 No. 4, pp. 487-506.

Rudkowski, J., Heney, C., Yu, H., Sedlezky, S. and Gunn, F. (2020), "Here Today, Gone Tomorrow? Mapping and modeling the pop-up retail customer journey", *Journal of Retailing and Consumer Services*, Vol. 54, available at: https://doi.org/10.1016/j.jretconser.2018.11.003.

Savastano, M., Bellini, F., D'Ascenzo, F. and De Marco, M. (2019), "Technology adoption for the integration of online–offline purchasing", *International Journal of Retail and Distribution Management*, Vol. 47 No. 5, pp. 474-492.

Scharl, A., Dickinger, A. and Murphy, J. (2005), "Diffusion and success factors of mobile marketing", *Electronic Commerce Research and Applications*, Vol. 4 No. 2, pp. 159-173.

Sinisalo, J. and Karjaluoto, H. (2009), "The impacts of mobile phone capabilities on mobile service usage: empirical evidence from Finland", *International Journal of Mobile Marketing*, Vol. 4 No. 1, pp. 4-11.

Tupikovskaja-Omovie, Z. (2018), "Mobile eye tracking technology in digital consumer satisfaction", *NWCDTP Conference 2018: Digital Humanities, Human Technologies, University of Salford*, MediaCityUK, Manchester, 10/10/2018.

Tupikovskaja-Omovie, Z. and Tyler, D.J. (2019), "Mobile consumers' shopping journey types: eye tracking digital user behaviour patterns in fashion m-retail", *AM2019: The 52nd Academy of Marketing Conference 'When you tire of marketing you tire of life'*, London, 4/7/2019.

Tupikovskaja-Omovie, Z. and Tyler, D.J. (2018), "Mobile consumer shopping journey in fashion retail: eye tracking mobile apps and websites", *Proceedings of the 2018 ACM Symposium on Eye Tracking Research and Applications (ETRA 2018)*, Warsaw, Poland, 14/6/2018.

Tupikovskaja-Omovie, Z., Tyler, D., Chandrasekara, S. and Hayes, S. (2015), "Mobile app versus website: a comparative eye-tracking case study of topshop", *Proceedings of the 17th*

International Conference on Mobile Business and Commerce, (ICMBC 2015), London, October 2015, pp. 23-24.

Tupikovskaja-Omovie, Z., Tyler, D., Chandrasekara, S. and Hayes, S. (2014), "Segmenting the UK mobile fashion consumer", *Proceedings of the 13th International Conference on Mobile Business (ICMB 2014), AIS Electronic Library (AISeL)*, available at: http://aisel.aisnet.org/icmb2014/2.

Vakulenko, Y., Shams, P., Hellström, D. and Hjort, K. (2019), "Service innovation in e-commerce last mile delivery: mapping the e-customer journey", *Journal of Business Research*, Vol. 101, pp. 461-468.

Voorhees, C.M., Fombelle, P.W., Gregoire, Y., Bone, S., Gustafsson, A., Sousa, R. and Walkowiak, T. (2017), "Service encounters, experiences and the customer journey: defining the field and a call to expand our lens", *Journal of Business Research*, Vol. 79, pp. 269-280.

Wagner, G., Schramm-Klein, H. and Steinmann, S. (2020), "Online retailing across e-channels and e-channel touchpoints: empirical studies of consumer behavior in the multichannel e-commerce environment", *Journal of Business Research*, Vol. 107, pp. 256-270.

Wang, Q.Z., Yang, S., Liu, M.L., Cao, Z.K. and Ma, Q.G. (2014), "An eye-tracking study of website complexity from cognitive load perspective", *Decision Support Systems* Vol. 62 No. 1, pp. 1-10.

Wells, R., Kleshinski, C.E. and Lau, T. (2012), "Attitudes toward and behavioral intentions to adopt mobile marketing: comparisons of gen Y in the United States, France and China", *International Journal of Mobile Marketing*, Vol. 7 No. 2, pp. 5-25.

Yang, K. and Kim, H.-Y. (2012), "Mobile shopping motivation: an application of multiple discriminant analysis", *International Journal of Retail and Distribution Management*, Vol. 40 No. 10, pp. 778-789.

Zhang, R., Chen, J.Q. and Lee, C.J. (2013), "Mobile commerce and consumer privacy concerns", *The Journal of Computer Information Systems*, Vol. 53 No. 4, p. 31.

Zhang, Y. and Juhlin, O. (2016), "Fashion in mobile phone design-the emergence of beautification, desirability and variation through institutional collaboration", *Fashion Practice*, Vol. 8 No. 1, pp. 63-84.

Zomerdijk, L.G. and Voss, C.A. (2011), "NSD processes and practices in experiential services", *Journal of Product Innovation Management*, Vol. 28 No. 1, pp. 63-80.

Corresponding author
Zofija Tupikovskaja-Omovie can be contacted at: zofi.t.omovie@gmail.com: z.tupikovskaja-omovie@mmu.ac.uk