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Online Purchase Behavior of Mobile-Only-Internet-Users across Countries

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Abstract

As the world becomes increasingly interconnected, a growing number of consumers rely solely on mobile devices for their internet access. This research investigates the online buying behavior of Mobile-Only-Internet-Users (MOIUs) across cultures, utilizing two of Hofstede's cultural dimensions and income per capita (IPC) as independent variables. Traditionally, internet shopping research focused on desktop access, assuming consumer behavior could be attributed to demographics, goals, and attitudes. However, with the rise of mobile Internet, this study aims to understand how patterns shift when ownership and access to desktop computers become less relevant for online buying. The research identifies that MOIU numbers negatively correlate with Hofstede's cultural dimension, Individualism vs. Collectivism (IDV) scores, emphasizing that users in individualistic societies prioritize data privacy. Young users (15 - 29 years) are more likely to be MOIUs across countries, indicating a generational shift towards mobile-only usage. GDP per capita shows no significant impact on global MOIU percentages. The study concludes by emphasizing the roles of uncertainty avoidance and demographic variables in MOIU behavior. Countries with higher IDV scores exhibit lower MOIU percentages, while Uncertainty Avoidance Index (UAI) has no significant effect. Future research should explore cross-cultural patterns in situated vs. ubiquitous online buying behavior amidst continuous technological development.

Keywords

Mobile-Only-Internet-Users (MOIU), Online Buying Behavior, Hofstede Cultural Dimensions, Cross-Cultural, Social Networking

1. Introduction

Mobile marketing can be seen as the evolution of Internet-based marketing (e-

commerce scenario) to the mobile channel to respond to the emerging trend of consumers losing interest in traditional marketing channels (Hinz et al., 2011). In the last few years, there has been an exponential rise in the use of mobile devices for internet access. Now, it is much easier to do electronic transactions using mobile devices, Personal Digital Assistant (PDA), and tablet computers, allowing wireless transactions from any location with internet connectivity. As a result, mobile commerce has grown as a separate channel from $70.7 billion in 2007 to $187.9 billion in 2012 (Uglow, 2007). This growth is easily reflected in millions of consumers glued to mobile screens at coffee shops, train stations, and airport gates. The significant uncertainty is regarding the size and characteristics of the target mobile consumer market. Various statistics support the increasing potential of mobile commerce. For instance, according to The Nielsen Company (2010), among smartphone users, 29% report using their devices for shopping or retail purposes. Nielsen also identified popular transaction-related activities such as locating nearby stores (50%), comparing prices (38%), accessing "Deal of the Day" apps (29%), and sharing product recommendations via mobile apps (20%). Predictive models, such as those employing random forest algorithms, have demonstrated considerable accuracy in forecasting online consumer behavior across different cultural settings (Joshi, Gupte, & Saravanan, 2018). These findings indicate that understanding and forecasting consumer behavior patterns can significantly boost both consumer engagement and revenues.

These statistics indicate that wireless connections can boost both consumer usage and revenues. Some studies (Sterling, 2001; Napoli & Obar, 2014) suggest users may still prefer desktop or laptop computers connected to stable internet networks for online shopping, particularly at home and during weekends.

Mobile-only Internet Users (MOIU) are individuals who exclusively use smartphones or feature phones for internet access, having neither owned nor used other connected devices (see **Figure 1** below).

This paper aims to study MOIU's online buying behavior patterns across cultures, using two of Hofstede's cultural dimensions and income per capita (IPC) as independent variables. Until now, research on Internet shopping implied accessing the Internet via desktop computers.

2. Literature Review

In the desktop-only era, it was reasonable to believe that how people shopped online or reacted to advertisements could be attributed to their demographics, goals, and attitudes. In the early days of desktop shopping, for instance, navigational difficulties increased consumer reluctance to engage in online shopping (Jarvenpaa & Todd, 1997) even though consumers recognized internet shopping to be timesaving (Alreck & Settle, 2002). Interest in online shopping was higher among men than women (Meuter et al., 2003), perhaps because women found online shopping riskier than men (Garbarino & Strahilevitz, 2004). As online shopping became more popular, women expressed a "shopping as fun" orientation, while men were more likely to be "quick" shoppers (Hansen & Jensen, 2009).

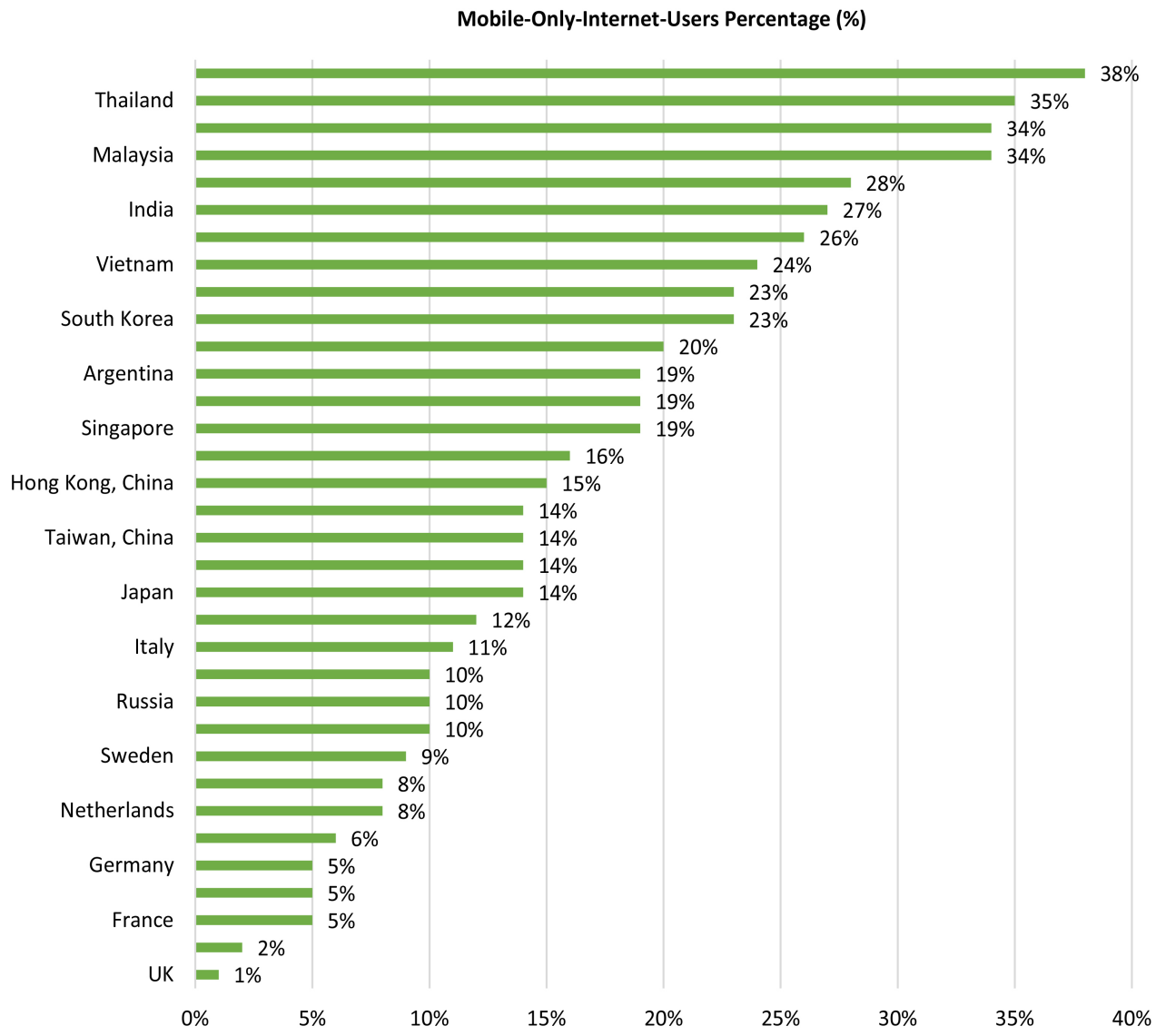

Figure 1. Mobile-only-Internet-Users are defined as those who own a smartphone/feature phone, and/or used a smartphone/feature phone to go online in the last month. They do not own any other connected devices and have not used any connected devices to get online within last month (Source: https://www.globalwebindex.net).

With the emergence of mobile Internet, access to the desktop computer becomes less relevant, and the physical context becomes more consequential. According to survey reports by InMobi (**Table 1**), Asian and African nations demonstrate more situated mobile web usage, where mobile web is mainly used in bed, while watching TV, or while waiting for something. However, UK and USA users demonstrate ubiquitous use, where frequent usage occurs while spending time with family, commuting, shopping, and in social gatherings. The USA and UK also demonstrate a higher percentage of shopping-related usage and a higher number of minutes used on mobile devices. Understanding how the physical context affects consumer engagement with the electronic market space becomes essential once ownership and access are ascertained.

Table 1. Percent of mobile web users by country that use the mobile in various occasions.

Usage context	US	UK	South Africa	Kenya	Indonesia	Australia	Malaysia	Singapore	India	New Zealand
Lying in bed	79	79	63	61	69	46	47	60	54	65
Watching TV	72	71	37	19	29	51	28	29	26	33
Waiting for something	70	68	26	25	35	43	50	48	24	40
In the bathroom	46	34	10	4	6	12	6	11	8	13
Spending time with family	44	37	18	19	17	14	18	18	20	23
Commuting	42	39	14	14	14	22	12	26	12	13
Shopping	38	34	8	3	5	12	11	15	8	16
Social gatherings	37	32	7	10	5	11	13	12	10	12

Data Source: https://www.statista.com/topics/779/mobile-internet/#topicOverview (year 2021).

Physical-social Context Cues and their Influences:

Increasing mobile device ownership has led to many location-based mobile applications such as Foursquare, Gypsii, Brightkite, Whrrl, and Gowalla. Conventional marketers such as HSN.com, for instance, have a full series of mobile applications for the iPhone™ and iPod touch®, allowing the consumer to shop. These technologies change how consumers access and consume information and how firms and organizations reach clients and deliver their services (Demirkan & Spohrer, 2014; Gao et al., 2013).

Effect of UAI, IDV on Online Purchase through Mobile Devices

According to some studies, public Wi-Fi and 4G internet connections are less secure than VPNs (virtual private networks). Regarding public Wi-Fi, attackers have more opportunities to exploit vulnerabilities via a connection over Wi-Fi than over 4G. As far as the security of these connections, here is how they rank from most secure to least secure:

1) Using a VPN over a cellular network or using a VPN over Wi-Fi

2) Cellular only

3) Wi-Fi only

Therefore, based on the insights from the literature review, regarding online purchase behavior using various Hofstede's cultural dimensions, the following hypotheses are proposed, and tests are conducted:

Hypothesis 1 (H1): Countries with higher UAI and IDV scores will have lower MOIU percentages.

Hypothesis 2 (H2): Young users (15 - 29 years of age) across countries are more likely to be MOIU but more so in countries with high IDV scores.

The MOIU numbers in Table 2 (as a percentage of total online buyers) and Hofstede's IDV and UAI scores for 34 countries are used to test these hypotheses. The MOIU data for years 2021-2022 are collected from https://www.globalwebindex.net/.

Table 2. MOIU as percentage of total online buyers.

Country	MOIU	IDV	GDP_pcap	UAI	Young Population %
Argentina	18.5	46	19934.37	86	23.56455
Australia	9.9	90	46789.93	51	20.6189
Belgium	7.8	75	46383.24	94	18.08683
Brazil	22.56	38	15127.81	76	25.29881
Canada	4.94	80	44025.18	48	19.64363
China	13.9	20	15534.7	40	22.32186
France	4.95	71	41466.27	86	17.71794

3. Hypotheses Tests and Results

H1: Countries with higher UAI and IDV scores will have lower MOIU percentages.

Using MOIU percentage as the dependent variable and UAI, IDV scores, and GDP per capita as independent variables, linear regression is conducted to test H1.

Table 3 indicates a significant negative correlation between MOIU percentages and Individualism (IDV) scores ($\beta = -0.657$, $p < 0.0001$), implying that individualistic societies have fewer mobile-only users, possibly due to higher concerns about data privacy. Conversely, Uncertainty Avoidance (UAI) and GDP per capita showed no significant effects. This can be attributed to the trend that users of individualistic societies are more concerned about their data privacy than those of collectivist societies. Another explanation would be that the more individualistic nations have better infrastructure than the more collectivist nations; the users have more opportunities to use other devices like iPads and laptops to access the Internet. So, they are less likely to be mobile only.

Table 3. Result of H1 (Dependent Variable: MOIU percentage in a country).

Model		Unstandardized Coefficients		Standardized Coefficients	T	Significance Pr > |t|
		B	Std. Error	Beta		
1	(Constant)	34.38368	4.92775	0	6.98	<0.0001
	UAI	−0.05307	0.05266	−0.13207	−1.01	0.3217
	IDV	−0.26763	0.05430	−0.65700	−4.93	<0.0001
	GDP_pcap	−0.00006755	0.00006659	−0.13681	−1.01	0.3185

H2: Young users (15 - 29 years of age) across countries are more likely to be MOIUs.

We first regress the percentage of MOIU against yp (the percentage of the young population aged between 15 - 29 years) and GDP_pcap (GDP per capita)

The results are below:

Table 4 highlights that young users (15 - 29 years) significantly correlate with higher MOIU percentages across countries (β = 0.685, $p = 0.0001$). We find that Generation-Z users are more likely to be Mobile-Only-Internet-Users across countries, and GDP per capita has no effect on the same ($p = 0.6614$).

Table 4. Result of H2a (Dependent Variable: MOIU percentage in a country).

Model		Unstandardized Coefficients		Standardized Coefficients	T	Significance Pr > |t|
		B	Std. Error	Beta		
1	(Constant)	−17.68414	9.32900	0	−1.90	0.0674
	yp	1.56271	0.35819	0.68515	4.36	0.0001
	GDP_pcap	0.00003429	0.00007754	0.06944	0.44	0.6614

Next, we regress MOIU against YP, IDV, and GDP_pcap to check the moderating effect of IDV on MOIU in combination with YP (Table 5):

Table 5. Result of H2b (Dependent Variable: MOIU percentage in a country).

Model		Unstandardized Coefficients		Standardized Coefficients	T	Significance Pr > |t|
		B	Std. Error	Beta		
1	(Constant)	−2.70092	7.30363	0	−0.37	0.7141
	IDV	−0.22732	0.04213	−0.55806	−5.40	<0.0001
	yp	1.28409	0.26446	0.56299	4.86	<0.0001
	GDP_pcap	0.00007005	0.00005654	0.14188	1.24	0.2249

As expected, young users aged between 15 - 25 years are more likely to be MOIU in collective societies. Higher IDV is still having a negative correlation with MOIU numbers (β = −0.558, $p < 0.0001$).

4. Conclusion, Limitations and Future Research Direction

This research study explores the effects of Hofstede's cultural dimensions and demographic variables on the online buying behavior of MOIU consumers from different countries. Cultures high on individualism are harder to penetrate. The findings of this study are in accordance with expectations. The primary factors affecting internet penetration in different countries are also investigated. This gives an important perspective of the critical foundation of the e-commerce industry, i.e., access to the Internet to the populace—which forms the superset of potential buyers. Internet penetration positively correlates with high education levels and per-capita incomes in countries. The level of landline phone penetration does not affect the internet penetration.

Future studies could explore how search time is related to uncertainty avoidance and other contextual factors. We find that users from countries low on IDV are more likely to write post-purchase online reviews. Therefore, examining the cultural dimensions and customers' attitudes toward online shopping for e-commerce players is essential.

It could also be explored how two culturally dissimilar countries differ in consumers' buying intention and search time on e-commerce websites by doing moderated regression and simple regression analyses with income, education level, social influence, attitude, and behavioral control as independent variables. Consumers do not have complete control over their online transactions. Therefore, perceived behavioral control described in the theory of planned behavior (TPB) (Ajzen, 1985, 1991) and trust have become critical factors in e-commerce (Pavlou & Chai, 2002). According to TPB, attitude and subjective norms could also be incorporated as key predictors of online behavior (Pavlou & Chai, 2002).

Future research should try to enhance the predictive power of the proposed model as to how consumers from collectivist countries maneuver from social networking websites to shopping websites by considering the interaction effects of additional cultural dimensions. Additionally, the issue of small sample size could be alleviated in future studies to avoid adverse effects on the study about the same.

We find that per capita income on a PPP (Purchasing Power Parity) basis does not affect the percentage of MOIU globally. This can be attributed to the fact that broadband and Wi-Fi infrastructure are still unavailable for most users, particularly in small towns—which in turn means they cannot access the Internet on desktops, and MOIU becomes a viable option.

The roles of uncertainty avoidance and the demographic variables are identified in the online purchase behavior of mobile-only-internet-users (MOIU) vs. desktop-internet users. It is found that the countries with high IDV scores have lower percentages of MOIU, and UAI has no effect, irrespective of the fact that internet access with mobile devices offers less data privacy. The more individualistic nations have better infrastructure and more opportunities to use other mobile devices like iPads and laptops to access the Internet. So, they are less likely to be mobile only.

In addition, it was found that the effect of IDV scores and the age of users—on MOIU number—is significant, too. Also, young users between 25 and 35 years old are much more likely to fall into the MOIU category, irrespective of which country they come from.

The continuous development in technology is expected to keep changing the current mobile landscape, as functions included in mobile apps provide better experiences for users across cultures. Some research has been done about ubiquitous vs. situated browsing patterns of MOIU users segmented into various clusters based on demographic variables (Banerjee & Dholakia, 2013). However, the cross-cultural patterns about the same are still unexplored, and future research will involve finding the patterns of situated vs. ubiquitous online buying behavior across cultures.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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