

Mobile Commerce and Success Factors. Simulation and Modeling of the Problem

Aristotelis Chantzaras, Nasiopoulos K. Dimitrios and D.S. Vlachos

Introduction

Mobile commerce (m-commerce) is one of the fast growing commercial websites based on mobile technologies (Chan and Yee-Loong Chong 2013). M-commerce is an IT-supported business innovation (Lu 2014), and offers business opportunities through Internet access without geographic constraints, as well as personalization and location-based service (Hong 2015).

Although m-commerce system has been regarded as an extension of electronic-commerce (e-commerce) (Chu 2015), which trades the goods, services, and information, the pattern of m-commerce is different from that of e-commerce in terms of interaction styles, usage patterns, and value chain (Chu 2015). Also m-commerce system has moved beyond the PC/TV's static terminal to anytime, anywhere use of mobile devices (Hong 2015).

M-commerce has much more potential compared to e-commerce due to its characteristics such as ubiquity, personalization, and flexibility, so that m-commerce can cover not only transactions of money and goods, but also other entertainment activities. Also m-commerce is superior to e-commerce to provide location-, customer-, personalization-, presence-, and context-based services (Choi et al. 2008).

A BI Intelligence report states that by 2020, m-commerce will make up 45% of total e-commerce, equaling \$284 billion in sales. That is more than 3 times what is expected for 2016: BI Intelligence predicts mobile commerce will hit 20.6% of overall e-commerce, or \$79 billion (Fig. 1).

After bibliographical and article—paper research, it can safely be assumed that the most important factors concerning the success of m-commerce are:

A. Chantzaras · N.K. Dimitrios (✉) · D.S. Vlachos
Department of Computer and Telecommunications, University of Peloponnese,
Tripolis, Greece
e-mail: dit13159@uop.gr

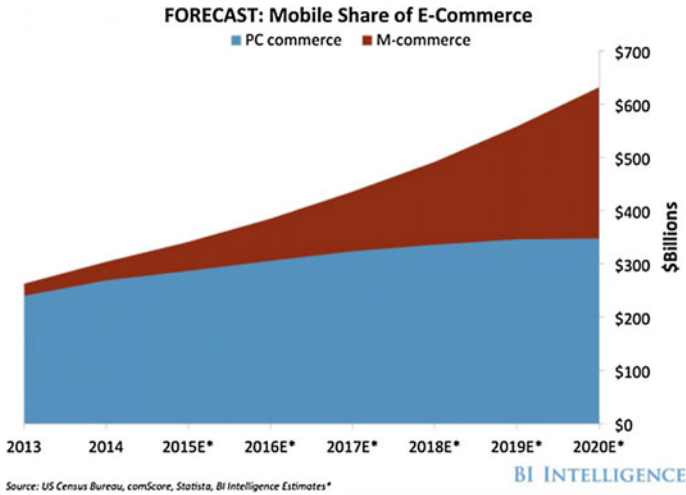


Fig. 1 BI intelligence graph that predicts future m-commerce share

1. Security—Trust
2. Personalization—Localization
3. Convenience.

Security—Trust

Security and the sense of trust it provides to the customer is probably the most important factor for an individual to make the decision of buying an m-commerce promoted product. M-commerce involves great uncertainty and risk (Zhou 2011). There is absolutely no customer that would willingly give his/her personal information for transactions with a website that is not trusted and is not considered of high credibility, which derives from the fact that trust is considered a major obstacle in initiating customer relationships (Shao Yeh and Li 2009). On the other hand, a customer that trusts the website will not have second thoughts and concerns about a purchase and is more likely to buy right away because if it is established, trust has a significant and positive relationship in adoption of m-commerce (Yadav et al. 2016) and is central to the success of personal relationship building (Shao Yeh and Li 2009).

Personalization—Localization

Users need to be able to define how they shop and what they see but moreover the detail content needs to be wrapped around them. Suggested products that are close to user's interests, preferences, and previous purchases are more likely to get their

attention. Within personalization, we can merge the localization factor which modifies the promoted to the user content adding high rated and visited products that users in his/her demographic area have purchased—suggested (local trends) and/or products that correspond to the local needs and conditions.

Convenience

Convenience refers to the extent to which m-commerce makes easier for customers to conduct transactions (Khalifa and Ning Shen 2008). A user that is not satisfied by this factor is more likely to abandon the purchase he could possibly make. Although being able to buy products anytime, anywhere is quite convenient, the levels of convenience can increase dramatically by these factors:

1. Speed: The website should be light and easy for the browser to project, because otherwise the user’s patience could run out and leave.

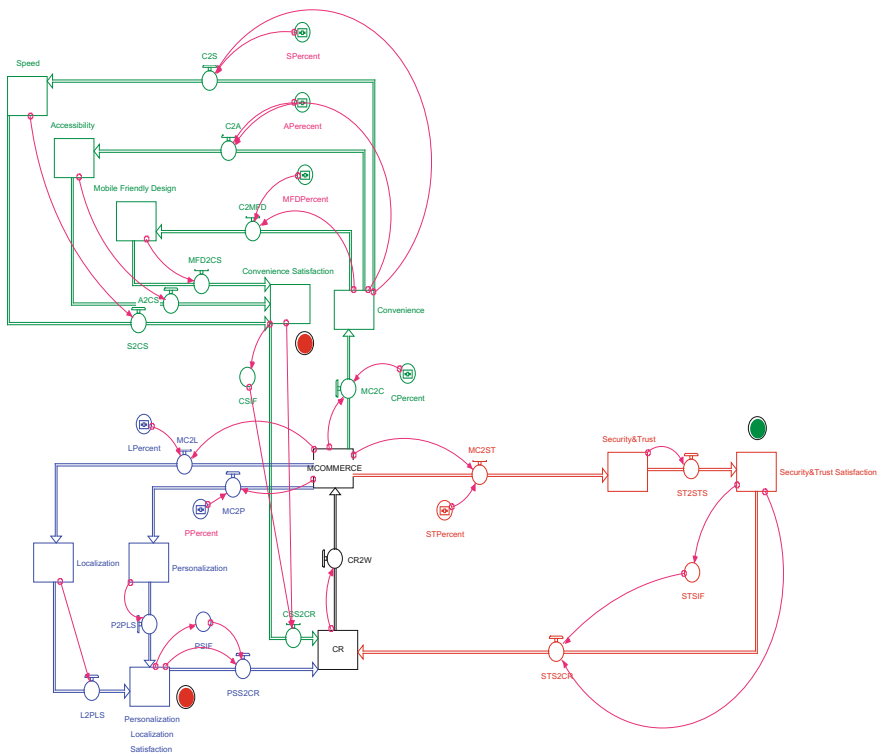


Fig. 2 Simulation model of the problem

- 2. Accessibility: The site should be easily accessed and an understandable and handy navigation through the different choices should be provided to ease the customer.
- 3. Mobile Friendly Design: Many websites have problems adjusting to mobile devices and lead the users to frustration. Users should not be tired but on the contrary be fascinated by the design patterns (Fig. 2).

Simulation Model

The company’s resources (stock CR) are flowing to the m-commerce stock so they can be distributed to the other stocks that represent the factors. To the down-left side the resources are given to the localization and personalization stocks. When the personalization–localization satisfaction is more than 50% satisfied, resources are returned to the CR. On the down-right side, resources are invested to the Security and Trust stock. When security and trust satisfaction is more than 70% satisfied resources return to the CR. On the upper left side of the model, resources are given to the convenience stock. Then they are shared appropriately to the stocks: speed, accessibility and mobile friendly design. When the convenience satisfaction is more than 60% satisfied, resources are returned to the CR (Figs. 3 and 4).

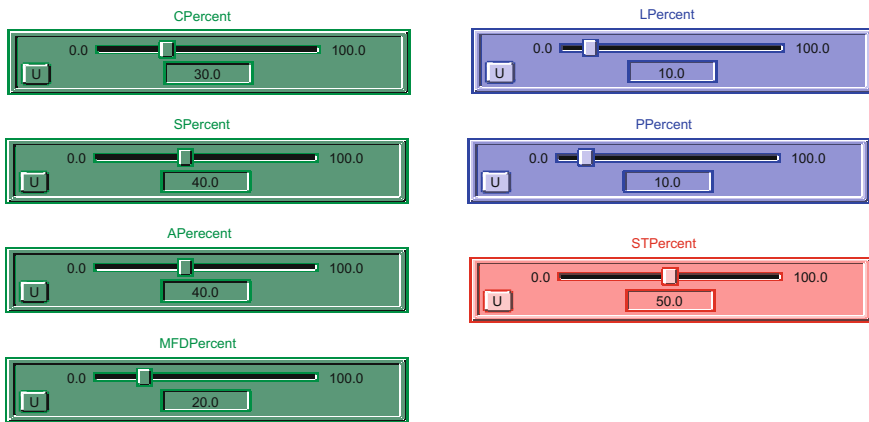


Fig. 3 Interface of the values that are used in the simulation model

Months	CR	Convenience	Speed	Accessibility	Mobile Friendly Design	Convenience Satisfacti
1.00	100.00	30.00	12.00	12.00	6.00	30.00
2.00	45.70	28.48	11.95	11.95	5.98	60.00
3.00	78.16	23.35	10.87	10.87	5.43	55.96
4.00	70.77	21.56	9.49	9.49	4.74	66.05
5.00	77.51	21.68	8.88	8.88	4.44	57.25
6.00	67.49	22.48	8.84	8.84	4.42	63.65
7.00	91.29	22.41	8.91	8.91	4.46	53.88
8.00	83.27	22.24	8.92	8.92	4.46	59.89
9.00	89.09	22.08	8.87	8.87	4.43	50.73
10.00	78.59	22.36	8.91	8.91	4.46	57.45
11.00	69.90	22.44	8.94	8.94	4.47	64.01
Final	81.60	22.23	8.93	8.93	4.46	54.18

Fig. 4 Results of CR, convenience, speed, accessibility, mobile friendly design, convenience satisfaction, throughout the simulation

Tables—Graphs

It can be seen that throughout the whole simulation, the convenience satisfaction is relatively steady. This steady rate is due to the easy adjustment of the users, from the very first months (Fig. 5).

About the personalization–localization satisfaction, some time is needed so that the content can be adjusted completely to the user’s preferences and local needs–trends and then the satisfaction is stabilized to satisfactorily levels. About the security and trust satisfaction, after 1 month, the users are convinced for their data–transactions safety and the satisfaction ranges in high and satisfactorily levels (Fig. 6).

Months	Personalization	Localization	Personalization Localizat	Security&Trust	Security&Trust Satisfac
1.00	10.00	10.00	10.00	50.00	50.00
2.00	9.49	9.49	29.92	47.46	81.05
3.00	7.78	7.78	47.54	38.92	67.53
4.00	7.19	7.19	49.56	35.93	66.30
5.00	7.23	7.23	50.62	36.13	64.75
6.00	7.49	7.49	52.62	37.47	64.52
7.00	7.47	7.47	41.73	37.35	64.88
8.00	7.41	7.41	43.38	37.06	64.94
9.00	7.36	7.36	45.44	36.81	64.75
10.00	7.45	7.45	47.09	37.27	64.89
11.00	7.48	7.48	49.31	37.41	65.05
Final	7.41	7.41	50.94	37.06	65.07

Fig. 5 Results of personalization, localization, personalization–localization satisfaction, security and trust, security and trust satisfaction, throughout the simulation

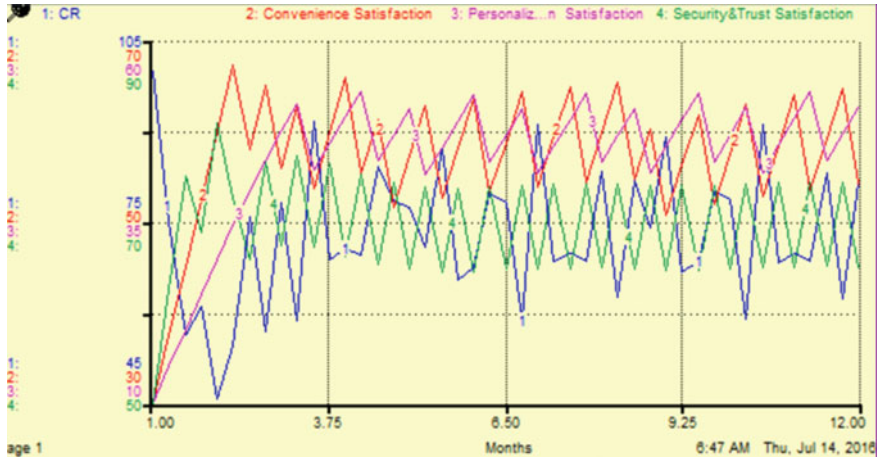


Fig. 6 Graphical display of the results of CR, convenience satisfaction, personalization-localization satisfaction, security and trust satisfaction throughout the simulation

Conclusions

With the right distribution of resources and the ideal circumstances, this simulation model produces high rates of satisfaction to all the crucial factors for the success of m-commerce.

It is concluded that the most important factor for the success of m-commerce security and trust, because it is what the user will certainly check before proceeding to actually buy a product and as soon as he/she is convinced-satisfied, the satisfaction values remain higher than any other factor (always greater than 64.52%) throughout the whole simulation.

References

- BI Intelligence report on Mobile Commerce presented at <http://digiday.com/brands/mobile-commerce-going-2016/>.
- Chu, Phuong Anh. 2015. Factors influence customer satisfaction in mobile commerce—A research on Vietnamese mobile users, Bachelor's Thesis.
- Chan, Felix T.S., and Alain Yee-Loong Chong. 2013. Analysis of the determinants of consumers' m-commerce usage activities. *Online Information Review* 37 (3): 443–461.
- Choi, Jeewon, Hyeonjoo Seol, Sungjoo Lee, Hyunmyung Cho, and Yongtae Park. 2008. Customer satisfaction factors of mobile commerce in Korea. *Internet Research* 18 (3): 313–335.
- Hong, Hyun Gi. 2015. Success factors of mobile-commerce system 8 (S7): 630–637.
- Khalifa, Mohamed, and Kathy Ning Shen. 2008. Explaining the adoption of transactional B2C mobile commerce. *Journal of Enterprise Information Management* 21 (2): 110–124.
- Lu, June. 2014. Are personal innovativeness and social influence critical to continue with mobile commerce? *Internet Research* 24 (2): 134–159.

- Shao, Yung Yeh, and Yung-Ming Li. 2009. Building trust in m-commerce: Contributions from quality and satisfaction. *Online Information Review* 33 (6): 1066–1086.
- Yadav, Rajan, Sujeet Kumar Sharma, and Ali Tarhini. 2016. A multi-analytical approach to understand and predict the mobile commerce adoption. *Journal of Enterprise Information Management* 29 (2): 222–237.
- Zhou, Tao. 2011. Examining the critical success factors of mobile website adoption. *Online Information Review* 35 (4): 636–652.