

## Influence of word-of-mouth and familiarity on diffusion and adoption of WeChat wallet in South Africa

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**Abstract:** The modern world has witnessed a significant growth of sophisticated mobile payment technologies in Africa. WeChat wallet application, for instance, was recently launched in South Africa to replace the traditional cash-based monetary systems, hence allowing consumers to conduct financial transactions electronically. This application, originated from China, has drawn wide attention of African consumers because of competitive and ease-to-use payment features it contains. Motivated by the huge demands of the application and by inadequacy of related studies in Africa, we have proposed a conceptual model demonstrating that familiarity of WeChat wallet and propagation of word-of-mouth (WOM) play a fundamental role in diffusion and adoption of a WeChat wallet feature, called Scan Merchant, in South Africa. The findings show that all hypotheses were supported, and that the proposed determinants could be explained by acceptance levels of variances: 58%, Scan Merchant; and, 53%, WOM. These promising findings imply that our model may be suitable for both theoretical and practical settings of diffusion and adoption of payment technologies in Africa.

### 1. Introduction

In a multicultural environment, diffusion and use of technology can significantly be impacted by communications through Word-Of-Mouth (WOM): informal person-to-person information transmission between commercial and non-commercial parties, and this transmission may involve communications regarding brand, product, organization, and/or service <sup>[1]</sup>. WOM allows people to discuss about innovations of impactful technologies, and allows them to share their negative experiences or critiques on certain technologies. Dissemination of information through WOM, such as opinions and recommendations on products and services bring people together into a common communication platform to discuss matters related to business. A typical scenario of WOM can be observed when a salesperson attempts to persuade a customer to purchase a product claimed to have competitive performance. When such a customer purchases the product and discovers a higher level of integrity in the information from the salesperson, the two transacting parties usually build a strong network, and the customer may, as a consequence, develop a re-purchase behavior. Subsequently, the customer may recommend the product to other customers. These advantages make WOM an indispensable tool that positively influences both business people and customers. This research investigates how WOM influences diffusion of a mobile payment technology, called WeChat wallet (Chinese application that was originally developed and introduced in China) in South Africa.

The widely discussed types of WOM include valence, which provides positivity or negativity of consumers' products reviews on previously experienced service outcomes <sup>[2]</sup>, and volume, which indicates the frequency at which consumers communicate WOM to others <sup>[3]</sup>. Extant studies have

shown that the former type can influence sales of products by changing perceptions of consumers towards values of products <sup>[4]</sup>. Volume WOM, on the other hand, has been linked to creation of customers' awareness on information of products in the market <sup>[5]</sup>. Collectively, valence and volume WOMs are powerful marketing tools because they provide strategies for spreading critical information on products/services. Our focus is on the valence WOM, especially on positive reviews that consumers make on products and services provided by developers.

In recent years, WOM practices have extended to online world. Consumers have, because of their increasing access to and use of Internet, been transformed from being passive to being active. Nowadays, most consumers, even those from the developing world, can use social networks to freely share positive and negative comments and experiences of products/services with colleagues (and, in some cases, with total strangers) <sup>[6]</sup>. This information that consumers share may influence other consumers to engage themselves in processes of technology diffusion or in purchases of products. In South Africa, a country used as a case study, we noted that WOM influences consumers to adopt Scan Merchant services, a feature of WeChat wallet that allows customers to pay by scanning QR (Quick Response) code containing price of goods. In addition, our study revealed the role played by familiarity of WeChat wallet towards consumers' intentions to adopt Scan Merchant services of the application.

Satisfaction of most consumers largely depends on perceptions and experiences from other consumers that have already used specific technologies. Focusing on Scan Merchant services, recently introduced and marketed in South Africa, our findings indicate that their adoption levels are strongly impacted by WOM information they receive from different sources, including person-to-person and media outlets. Concurrently, interviewed consumers expressed motivations to adopt Scan Merchant services when they were familiarized with WeChat wallet that embeds such services. These behavioral determinants (WOM and familiarity of WeChat wallet) may assist developers and managers to successfully establish business in developing countries. We, therefore, have developed a conceptual model with determinants that motivate consumers towards Scan Merchant services (Figure 1). This model may increase our theoretical understanding on how consumers from developing countries respond to electronic commerce services.

## 2. Theoretical bases

In e-commerce settings, Chen et al. <sup>[10]</sup>, motivated by Observational Learning Theory (OLT) <sup>[7]</sup>, observed purchases of other consumers as a behavior-based social interaction. The authors noted that consumers tend to learn and to develop purchasing behaviors by observing purchasing decisions of other people <sup>[11]</sup>. This tendency may be attributed to knowledge imperfection on products that some consumers may have during purchasing. The knowledge on products learned by other consumers may be a complimentary source that, if properly linked with their personal experiences, may promote more accurate purchase decisions. In social-driven (mobile) e-commerce platforms, consumers may leave valuable comments on products and services provided by sellers. For example, customers may state that they received fast shipping and delivery services, or that they added a given number of products in the "buy-lists" of a member's reference person. As supported by Cheung et al. <sup>[12]</sup>, this prior purchase information can establish a purchase guide and a reference to inexperienced consumers when they visit that electronic store. In addition, the information may positively impact purchase decisions of subsequent consumers. In e-commerce websites, for example, some consumers engage several observation learning activities before making final purchase decisions. Such consumers may navigate through products feeds, online opinions, users with similar purchase interests, and number of items purchased and successfully used.

Our research is theoretically built on OLT, which was derived from Information Cascade Theory in the economics literature <sup>[8]</sup>. This theory postulates that information learned through observation contains discrete signals that other consumers express through actions, but not through the reasons that drove their actions. Inexperienced consumers lack sufficient purchase information,

and, therefore, when they observe purchase actions from previous customers, they can compare the actions with their own private information to further shape or modify their original beliefs. Consequently, all subsequent observers may experience similar beliefs—a situation called information cascade. Benerjee<sup>[9]</sup>, highlighted that observers, after acquiring common purchase beliefs, may begin to follow their predecessors' actions and become inclined in a herd-type behavior.

### **3. Conceptual model and hypotheses development**

#### **3.1. Familiarity**

For decades, familiarity of a technology has been reported that it increases the likelihood for customers to have positive perceptions on the technology, and that it may lead to changes in the consumers' usage behaviors. Familiarity can serve as an indicator that a consumer has reached the highest level of awareness, and that s/he can confidently use services offered by a technology. Urbany et al.<sup>[10]</sup> argued that consumer's confidence, derived from familiarity, may take two forms of conceptualizations, namely knowledge and choice. The former conceptualization defines a degree of consumer's certainty on known information about a product's brand (available attributes, importance of such attributes, and brand performance on the attributes) under consideration. On the other hand, choice confidence refers to a consumer's certainty regarding the type of brand to choose. In the research by Park and Lessig<sup>[10]</sup>, an argument was made that consumer's choice confidence is a function of the person's familiarity with the brand. The authors found that low levels of familiarity reduce the consumers' discriminatory power when they make choices of purchasing products. As a consequence, unfamiliar consumers are more likely to exhibit low degree of choice confidence. Grounded by these previous findings, we have developed the following hypothesis:

**H1.** The familiarity of the WeChat wallet payment will positively influence the intention to use Scan Merchant services, and vice versa.

#### **3.2. Word of mouth**

In information systems, WOM plays a central role in determining consumers' awareness, which is directly linked to familiarity of a technology<sup>[5]</sup>. Godes and Mayzlin<sup>[11]</sup> suggest that conversations on products or technology increase with an extent at which consumers receive the related information, hence leading to an increase in sales. Using a similar conception and rationale, Neelamegham and Chintaguta<sup>[12]</sup> stated that research that uses models on technology diffusion usually investigates WOM through number of adopters; and, Zufryden<sup>[13]</sup> added that the investigation can be done through interaction between numbers of adopters and non-adopters of the technology. Backed by these evidences, we have formulated the following hypotheses:

**H2.** Familiarity of WeChat wallet payment positively influences word-of-mouth, and vice versa.

**H3.** Positive word-of-mouth on WeChat wallet positively influences consumers' purchase intention through Scan Merchant, and vice versa.

#### **3.3. Scan Merchant**

Scan Merchant refers to a payment method through scanning designated labels of digitally coded goods. This method can be accomplished after collection of goods from the supermarket's/shop's display or storage units, followed by submission of such goods to a point of sales<sup>[14]</sup>. WeChat wallet embeds this critical payment feature to allow customers pay, in a more convenient way, for goods and services from merchant stores, instead of using cash or credit cards that may add unnecessary delays to process customers' orders. The Scan Merchant service is convenient and efficient as consumers do not need to carry cash in their wallets all the time. Given the fast-growing Internet and bank infrastructures, Scan Merchant services are increasingly gaining popularity in African countries where WeChat has already been established. However, scholars

have not extensively seized this opportunity to understand determinants causing the popularity. In this study, adoption of Scan Merchant services has been proposed as a motivation that is impacted by familiarity of WeChat wallet and by word-of-mouth.

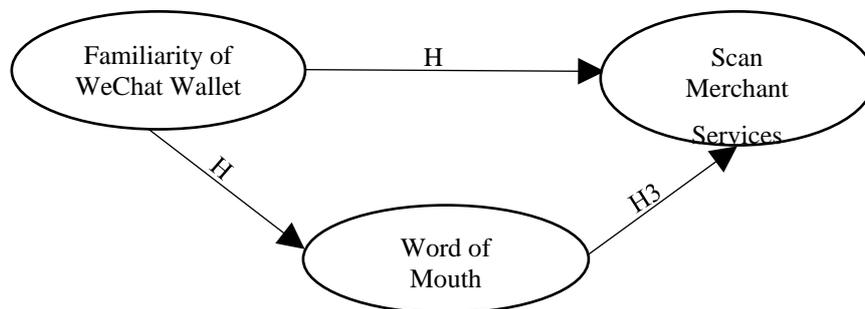


Figure 1. Proposed research model.

Table 1 Model measurements.

Fit index	Threshold	Initial measurement model	Modified measurement model
CMIN/DF	≤ 3.000	3.25	1.783
GFI (%)	≥ 90.0	88.2	95.4
AGFI (%)	≥ 80.0	82.0	92.1
NFI (%)	≥ 90.0	95.3	98.0
CFI (%)	≥ 90.0	96.7	99.1
RMR	≤ 0.05	0.91	0.04
RMSEA	≤ 0.08	0.100	0.06

#### 4. Methodology

As a way to overcome responses bias, twelve valid scale items from extant studies were adapted. These items include familiarity, word-of-mouth, and intention to adopt Scan Merchant services. To achieve measurements of the scales, a popular five-point Likert scale, with anchors ranging from strongly disagree (highest scale) to strongly agree (lowest scale), was applied. The Likert scale has, for a long time, been applied by several scholars to acquire important customers' behavioral aspects<sup>[15]</sup>. This scale gives an intuitive approach of analyzing and interpreting quantitative data. We used questionnaire as a research instrument to acquire answers from questions that measured the hypothesized constructs and their inter-relationships. Systematic steps to reduce responses biases in the instrument were followed: (1) two experts in the field were invited to undertake a pilot study, where they were requested to revise our questions to ensure cogency and brevity; and, (2) the revised questionnaire from experts was administered to thirty randomly chosen students, with South African nationality, of the Harbin Institute of Technology, P. R. China; the purpose of this procedure was to test validity and reliability of the instrument on a small sample before practically administering that instrument to a wide population in South Africa.

Survey data were collected between November 2016 and April 2017 using the survey tool, SurveyMonkey<sup>1</sup>. The process of data collection involved provision of a questionnaire link to respondents, so they could complete the questionnaire and submit their responses online (through SurveyMonkey) for analysis and interpretation. We received 224 responses from users of WeChat wallet. The Internet-driven data collection methods, such as ours, create a physical isolation between interviewers and participants, and such methods are preferred in survey settings where researchers and respondents cannot physically interact. Internet can serve as an important tool for remote data collection. However, data collection through Internet can be challenging in developing

<sup>1</sup> <http://www.surveymonkey.com>

countries, including South Africa, because of unreliable Internet infrastructure and (unaffordable) higher subscriptions to data services offered by local Internet service providers. Our decision to use Internet for data collection builds on the idea that the main participants of the survey were those from the millennial group, actively engaged in Internet-based sophisticated technologies and thought to have already installed Scan Merchant application in their mobile devices.

Analysis and interpretation of data was done using SEM (Structural Equation Modeling) statistical tool <sup>[15]</sup>. We used AMOS23 (analysis of moment structures) software, configured under the maximum likelihood estimates, to analyze Confirmatory Fit Indices (CFIs): normed Chi-Square to degree-of-freedom (CMIN/DF), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normed-fit index (NFI), CFI, and root mean square error of approximation (RMSEA)<sup>[16, 17]</sup> (Table 1). Measurements on reliability and validity were done using three quantitative indicators: composite reliability (CR), convergent validity, and discriminant validity. Furthermore, we determined convergent validity through AVE (Average Variance Extracted) and discriminant validity through MSV (Maximum Shared Variance), ASV (Average Shared Variance), and  $\sqrt{AVE}$  (Tables 2 and 3).

Using SPSS, the Harman method was selected to test the Common Method Bias (CMB)<sup>[16, 18]</sup>. This method determines CMB through inspection of CFA (Confirmatory Analysis) model, and through analysis of the degree at which majority of the model's variances can be defined by a single factor: more than fifty percent means possible existence of CMB in the instrument. Compared with other relatively more complex methods for testing CMB, the Harman's approach provides quicker results with acceptance accuracy.

Table 2. Reliability and validity of constructs.

	CR	AVE	MSV	MaxR (H)	F1	W0 M	S1
F1	0.964	0.899	0.533	0.968	<b>0.948</b>		
W0 M	0.949	0.824	0.562	0.950	0.730***	<b>0.908</b>	0.749***
S1	0.959	0.885	0.562	0.961	0.641***		<b>0.941</b>

Note: F1=Familiarity, S1=Scan Merchant, WOM=Word of mouth.

## 5. Results and Discussions

Initially, the model contained measurements that fell outside the recommended thresholds (Table 1). Therefore, as recommended by scholars <sup>[19]</sup>, reconfigurations and purifications were done to improve items of the model. Following recommendations by Byrne <sup>[20]</sup>, an item from "Familiarity" and another from "Scan Merchant" were, after extensive evaluation of all model items, eliminated, and CFA was re-executed. Modification of the initial model generated recommended values of fit indices. In addition, Tables 2 and 3 suggest that the instrument used in our research lacks reliability and validity issues, implying that it captured the intended latent variables. Lastly, results from the Harman's test verify that our instrument lacks CMB concerns.

Standardized estimates and their corresponding hypotheses are given in Table 3. Observing *p*-values thresholds along the hypothesized paths, the Table shows that all three hypotheses (H1, H2, and H3) were strongly supported. This finding signifies the importance of WOM and familiarity of WeChat wallet in motivating consumers to select Scan Merchant services. Therefore, developer of this application, and probably of other similar applications, should put more emphasis on the identified constructs.

Firstly, the supported hypothesis, H1, shows that consumers, when get familiarized with an application, may develop behavioral intentions towards that application. The familiarization process may be initiated by the developers and business people through promotions and sensitization

programs with a focus of creating awareness on the technology. More specifically, consumers should be educated on the value of a technology and its impacts in positively changing their lives. In our case, for instance, the Tencent Company that has developed WeChat wallet should demonstrate to customers how their technology works, or how consumers should benefit from various critical features of the application, including Scan Merchant investigated in this study.

Secondly, the supported hypothesis, H2, highlights the importance of having consumers familiarized with a technology. Such consumers acquainted with the technology may act as ambassadors to possibly spread good news of the technology to other people through WOM. Increasing familiarity in the technology among consumers imply an increased frequency of social interaction. We, however, caution that developers should ensure integrity in the information they give users (or expected users) of the technology.

Thirdly, with the supported positive relationship between WOM and intention to adopt Scan Merchant services, we argue developers to strengthen their communication channels with customers. Regardless of the type of technology, there should be a mechanism and an open environment for customers to socially interact and freely discuss merits and demerits of the technology. The systems that store and display customers' comments or perceptions on the technology should receive central administrations to ensure that no information is lost, and that customers receive genuine, complete, and unfalsified information from their fellows that had previously used the technology. If developers create competitive products, they mostly will receive positive comments that will increase chances for other customers to develop behavioral intention to adopt a technology.

The findings from this research show acceptable variances in the proposed constructs: WOM, 53%; and, Scan Merchant, 58%. These promising findings imply that our conceptual model may bring significant theoretical and practical inputs within a scholarly community and among practitioners in the field. The model may be extended using other mobile payment technologies popular in developing countries. However, the findings should cautiously be used in view of the study limitation: smaller sample size that may not generalize well to a larger population. Mixed data collection methods may be used to address the limitation. From this study, we noted that paper- and Internet-based survey methods, if properly combined and used for data collection, may increase the number of responses from the interviewed sample population.

Table 3 Standardized estimates.

H#	Conceptualization path	Estimate	S.E.	C.R.	P-Value	Remarks
H1	F1<-->WOM	1.160	.143	8.104	***	Supported
H2	F1<-->S1	1.126	.149	7.568	***	Supported
H3	S1<-->WOM	1.088	.132	8.262	***	Supported

Note: F1=Familiarity, S1=Scan Merchant, WOM=Word of mouth

## 6. Conclusion

We have proposed a conceptual model that shows the role of familiarity of WeChat wallet and word-of-mouth in motivating South Africans to adopt Scan Merchant services of the application. The findings show that our model can satisfactorily explain 58% and 53% of the acceptable variances in Scan Merchant and WOM, respectively. This study gives some interesting insights for researchers to further investigate actual demands of consumers in developing countries to facilitate adoption of emerging mobile payment technologies. In the context of Africa, consumers have, traditionally, been using cash-based systems for transmission of finances to sales merchants. Therefore, migration from these traditional systems to modern ones requires further investigation. Technology developers may use our findings to understand behaviors of African consumers when they undertake financial exchanges through mobile payments. To maximize impacts of our study,

the findings should cautiously be applied by considering that a small population used in the study may limit the scope of application of the proposed conceptual model.

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## References

- [1] Cheng, S., T. Lam, and C.H. Hsu, *Negative word-of-mouth communication intention: An application of the theory of planned behavior*. Journal of Hospitality & Tourism Research, 2006. **30**(1): p. 95-116.
- [2] Hess, R.L. and L. Ring, *The influence of the source and valence of word-of-mouth information on post-failure and post-recovery evaluations*. Service Business, 2016. **10**(2): p. 319-343.
- [3] Anastasiei, B. and N. Dospinescu, *Electronic Word-of-Mouth for Online Retailers: Predictors of Volume and Valence*. Sustainability, 2019. **11**(3): p. 814.
- [4] Mayzlin, D., Y. Dover, and J. Chevalier, *Promotional reviews: An empirical investigation of online review manipulation*. American Economic Review, 2014. **104**(8): p. 2421-55.
- [5] Liu, Y., *Word of mouth for movies: Its dynamics and impact on box office revenue*. Journal of marketing, 2006. **70**(3): p. 74-89.
- [6] Fu, J.-R., P.-H. Ju, and C.-W. Hsu, *Understanding why consumers engage in electronic word-of-mouth communication: Perspectives from theory of planned behavior and justice theory*. Electronic Commerce Research and Applications, 2015. **14**(6): p. 616-630.
- [7] Bandura, A. and R.H. Walters, *Social learning theory*. Vol. 1. 1977: Prentice-hall Englewood Cliffs, NJ.
- [8] Bikhchandani, S., D. Hirshleifer, and I. Welch, *A theory of fads, fashion, custom, and cultural change as informational cascades*. Journal of political Economy, 1992. **100**(5): p. 992-1026.
- [9] Banerjee, A.V., *A simple model of herd behavior*. The quarterly journal of economics, 1992. **107**(3): p. 797-817.
- [10] Park, C.W. and V.P. Lessig, *Familiarity and its impact on consumer decision biases and heuristics*. Journal of consumer research, 1981. **8**(2): p. 223-230.
- [11] Godes, D. and D. Mayzlin, *Using online conversations to study word-of-mouth communication*. Marketing science, 2004. **23**(4): p. 545-560.
- [12] Neelamegham, R. and P. Chintagunta, *A Bayesian model to forecast new product performance in domestic and international markets*. Marketing Science, 1999. **18**(2): p. 115-136.
- [13] Zufryden, F.S., *Linking advertising to box office performance of new film releases-A marketing planning model*. Journal of Advertising Research, 1996. **36**(4): p. 29-42.
- [14] Matemba, E.D., G. Li, and B.J. Maiseli, *Consumers' Stickiness to Mobile Payment Applications: An Empirical Study of WeChat Wallet*. Journal of Database Management (JDM), 2018. **29**(3): p. 43-66.
- [15] Harman, H.H., *Modern factor analysis*. 1976: University of Chicago press.
- [16] Podsakoff, N., *Common method biases in behavioral research: A critical review of the literature and recommended remedies*. Journal of Applied Psychology, 2003. **88**(5): p. 10.1037.
- [17] Matemba, E.D., et al. *Consumers' Acceptance Intentions to Use Cashback Systems: A Case of SNAPnSAVE Application in South Africa*. in *Proceedings of the 2018 2nd International Conference on Software and e-Business*. 2018. ACM.

- [18] Matemba, E.D. and G. Li, *Consumers' willingness to adopt and use WeChat wallet: An empirical study in South Africa*. *Technology in Society*, 2018. **53**: p. 55-68.
- [19] Anderson, J.C. and D.W. Gerbing, *Structural equation modeling in practice: A review and recommended two-step approach*. *Psychological bulletin*, 1988. **103**(3): p. 411.
- [20] Byrne, B.M., *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. 2016: Routledge.