# Enhancing customer loyalty to mobile instant messaging: Perspectives of network effect and self-determination theories

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## ABSTRACT

Mobile instant messaging (MIM) apps are popular information and communication technologies (ICTs). As known for ICTs, network effect variables such as perceived network size and perceived complementarity are important for determining user loyalty. However, there is insufficient research on why they are determinants, i.e., knowing the underlying mechanism. Grounded in network effect and self-determination theories, we study such underlying mechanism. Based on an analysis of responses from an online survey of 292 participants using structural equation modelling, we find that the network effect variables of perceived network size and perceived complementarity are positively related to three user-perceived values, namely user-perceived functional, self-expressive, and social values. They are, in turn, positively related to satisfaction of the needs for competence, autonomy, and relatedness, respectively, that further leads to user loyalty. This study contributes to the MIM literature by being the first to use the three user-perceived values and satisfaction of the three needs as novel process variables to construct a model for explaining the impacts of network effect variables on user loyalty to MIM apps. This study provides the insight that MIM providers can more effectively enhance user loyalty by providing the three values that users appreciate and satisfying the three needs, when increasing and advertising their network sizes and availability of complementary offerings.

## 1. Introduction

Smartphones have numerous information and communication technology (ICT) functions (or apps) that are comparable to those of computers. It is estimated that the global revenues from apps will reach US$80 billion in 2020 (NewZoo, 2017), indicating abundant business opportunities. Among the apps, mobile instant messaging (MIM) apps (such as WhatsApp, LINE, Instagram, and Facebook Messenger) are highly popular and widely used. In 2016, MIM apps had 1.58 billion users, and this figure is projected to grow to 2.48 billion users in 2021 (Statista, 2017b), showing the relevance of research on MIM.

The promising market of MIM apps is under intense competition. Half of the top ten popular global MIM apps in 2014 (Chan, 2014) were no longer on the list in 2017 (Statista, 2017a). Moreover, 64% of the users never use the apps one month after

downloading them (Localytics, 2017). Such strong competition indicates the necessity for research on user loyalty (i.e., the intention to repeatedly use, or continuance intention) to MIM apps.

The literature on user loyalty to MIM apps has examined various antecedents to loyalty, including satisfaction, perceived usefulness (Deng et al., 2010; Oghuma et al., 2015; Oghuma et al., 2016; Zhou and Lu, 2011), habit (Gan, 2016; Hsiao et al., 2016), resistance to change (Gan, 2016; Gan and Li, 2015), trust (Deng et al., 2010), media richness (Tseng et al., 2017), enjoyment (Hsiao et al., 2016; Oghuma et al., 2015; Oghuma et al., 2016; Zhou et al., 2015), switching cost (Deng et al., 2010; Zhou et al., 2015), perceived quality of communication, relational switching cost (Gan and Li, 2015), network size (or perceived user base) (Gan, 2016; Gan and Li, 2015; Zhou et al., 2015; Zhou and Lu, 2011), and perceived complementarity (i.e., perceived availability of complementary offerings) (Zhou et al., 2015; Zhou and Lu, 2011). Overall, the literature has verified that network size and perceived complementarity have important impacts on user loyalty to MIM apps, while satisfaction significantly mediates such impacts. However, no previous studies have addressed the issue of how user-perceived values and user need satisfaction are process variables that relate network size and perceived complementarity to user loyalty to MIM apps, indicating a research gap. Research examining the role of user-perceived values is important. Such research could guide MIM app providers to focus on enhancing the values, i.e., attributes and functionality that are most appreciated by users, to effectively build strong user loyalty.

Moreover, research filling this gap would provide novel knowledge on aspects of values and aspects of need satisfaction relevant to MIM apps. Such knowledge lays the foundation for future MIM research to further explore ways to boost user loyalty to MIM apps, demonstrating the potential academic impact of the research.

To fill the research gap, we begin with features of MIM apps that are designed for communicating with other compatible users (those who use the same MIM apps). The utility derived from communication with other compatible users has been well explained by network effect theory (Katz and Shapiro, 1985), motivating us to adopt this theory as one theoretical underpinning. Moreover, MIM loyalty may come from various sources, including aspects of communication and relational outcomes (Gan and Li, 2015), and system usefulness aspects (Oghuma et al., 2015; Oghuma et al., 2016; Zhou and Lu, 2011). Such sources indicate that MIM might satisfy various user needs. Satisfaction of various needs has been frequently accounted for by self-determination theory (Ryan and Deci, 2000), justifying our adoption of this theory as the other theoretical underpinning.

We use both network effect and self-determination theories to guide model development in this study. Network effect theory has two clear major elements, i.e., network size and perceived complementarity (Katz and Shapiro, 1985). These two elements have been shown to be important for user loyalty to MIM apps (Gan, 2016; Gan and Li, 2015; Zhou et al., 2015; Zhou and Lu, 2011), demonstrating the necessity of including them in our study.

Moreover, self-determination theory incorporates three major needs, i.e., needs for autonomy, competence, and relatedness, motivating us to include user satisfaction of these three needs. Furthermore, user satisfaction and loyalty are determined by user-perceived values (Tseng et al., 2017). In the MIM context, user-perceived values also contribute to user satisfaction and loyalty (Deng et al., 2010; Tseng et al., 2017), motivating us to include user-perceived values in the model relating user satisfaction of various needs and loyalty to MIM apps. To choose what values to be included, we include the three needs in self-determination theory. First, satisfaction of the need for competency indicates that an individual feels capable when using MIM apps to communication, indicating the importance of usefulness of the communication functions of MIM apps, i.e., the functional value. Second, satisfaction of the need for autonomy indicates that an individual can demonstrate or present themselves with their free wills by using MIMs (Ang et al., 2015), i.e., the self-expressive value. Third, satisfaction of relatedness indicates that an individual can enjoy social interactions and social connections, i.e., the social value (Deng et al., 2010). Hence, we choose to include these three values.

Therefore, the purpose of this study is to examine how network size and perceived complementarity create values to users (functional value, self-expressive value, and social value), satisfy user needs (satisfaction of the need for competence, autonomy, and relatedness), thus fueling user loyalty to MIM apps. Overall, we contribute to the literature on MIM by clarifying the process by which network size and complementarity impact user loyalty to MIM apps. Such clarification should provide the insights that MIM providers should emphasize providing functional, self-expressive, and social values to meaningfully satisfy users' specific and corresponding needs, enabling the providers to more effectively build a loyal user base.

Compared with the highly related studies, this study is new in the following aspects. First, Gan and Li (2015), and Gan (2016) identified several antecedents to continuance intention (i.e., loyalty in our study) of using MIM apps, i.e., perceived user base, communication quality, relational switching cost, habit, and resistance to change. These antecedents show that MIM apps could provide various benefits (or values) to users, including social value (i.e., relational switching cost) and functional value (i.e., communication quality), motivating us to include these values. Moreover, our study is new in adding satisfaction of the three needs for competency, autonomy, and relatedness as novel process variables, thus clarifying how perceived user base (i.e., perceived network size) impacts loyalty.

Second, Oghuma et al. (2015) and Oghuma et al. (2016) found service quality, confirmation, and perceived usefulness contribute to user loyalty to MIM apps, while enjoyment and satisfaction are two important determinants of such loyalty. Our study is in concordance with theirs in examining the link between satisfaction and user loyalty to MIM apps. However, our study initiates to categorize MIM users' satisfaction into the satisfaction of the three needs for competence, autonomy, and relatedness. Such categorization clarifies the satisfaction concept and provides enhanced guidance for MIM app providers to utilize the findings in the MIM literature (e.g., Oghuma et al., 2015; Oghuma et al., 2016).

Third, Zhou et al. (2015) and Zhou and Lu (2011) explained how perceived network size and perceived complementarity impact users' loyalty to MIM. In their studies, they used perceived usefulness, perceived enjoyment, and switching barriers to explain such impacts. Our study joins in their works on explaining such impacts. However, our study includes novel process variables (i.e., three user-perceived values and three aspects of satisfaction). Such novel process variables demonstrate the complexity underlying the