

The Effect of Toolkits Usage and Ideation Community Contest on Innovation: The Mediating Role of Relationship Quality

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ABSTRACT

Limited studies have focused on how social media activities can contribute to organizational innovation. The purpose of this research is to investigate the impacts of toolkits usage and ideation community contest on innovation in the context of social media. Additionally, this study aims to narrow the gap by examining the intervening function of relationship quality amongst the two dimensions of social media activities and innovation respectively. Employing a sample of 393 manufacturing firms in Malaysia, our findings confirm that the toolkits usage and ideation community contest components of social media activities are positively correlated with innovation. Additionally, the findings found that relationship quality performs a mediating impact on social media activities and innovation. The study concluded with arguments concerning social media activities and its correlation to innovation transcend national boundaries. Based on the findings, several innovation strategies were put forward for Malaysian manufacturing firms.

1. INTRODUCTION

Innovation is considered as the backbone of corporate survival, development, and competitive advantage (Chatzoglou & Chatzoudes, 2018). It can be translated in the form of products, services, operations, techniques, and individual's needs (Gambardella, Raasch & von Hippel, 2017). Usually, firms rely on innovation processes to be competitive and to produce the innovative products to the marketplace (Chesbrough, 2006) with no or little collaboration with the external environment and consumers (Lichtenthaler & Ernst, 2008). This traditional innovation paradigm states that the innovation procedures have to be constrained by the company and heavily depend on its internal R&D (Chesbrough, 2003; Ramaswamy, 2008). In contrast, the modern innovation paradigm emphasizes the collection of innovation idea and knowledge from external sources to be competitive (Ritala & Hurmelinna-Laukkanen, 2013; Solima et al., 2016). Innovation is viewed as an outcome of collaborative interactions amongst manufacturers, consumers, and other related organizations (Laursen & Salter, 2006). Essentially, incorporating end user interaction in the innovation process can contribute to better and more valuable product offerings (Tekic & Anisic, 2013).

Firms in various industries are finding ways to engage their consumers in product innovation processes. The most popular form of customer engagement for product innovation is social media (Kaplan & Haenlein, 2010). Social media activities give entirely novel and useful customer interaction platforms where consumers share their needs and concepts in the product innovation process (Jussila, Kärkkäinen & Leino, 2013). The challenge for organization is to select an appropriate and affordable social media platform (Palacios-Marqués et al., 2015). Prior researchers have found toolkits usage and ideation community contests as viable platforms for interacting with customers, suppliers, and businesses related to the innovation process (Laroche et al., 2012). Although these studies have contributed to the innovation literature, to date, limited studies have focused on factors that are related to social media activities.

Recently, Puto, Ketut, Nyoman and Putu (2017) argued that innovation is not an isolated occurrence, but as a consequence of the relationship quality existing among diverse parties. The acquisition of customer ideas by corporations does not merely depend on the marketplace, but on social interaction across groups of collaboration and relationship quality. However, Zipkin (2001) argued that customers received limited value for the product they developed using social media activities since the product innovation cost usually exceeded the anticipated benefits. Although researchers argued that customers have ideas that can enhance firms' mechanical and commercial innovation procedures, few empirical studies have looked into the topic. Specifically, limited studies have investigated the link between social media activities dimensions and product innovation in manufacturing firms. Thus, grounded on social capital theory, the study aims to investigate the effects of social media activities on innovation in manufacturing firms. Additionally, this research attempts to analyse the mediating role of relationship quality amongst social media activities and innovation respectively.

2. LITERATURE REVIEW

2.1 Innovation

Innovation is a key element for manufacturing companies' to be competitive in the globalized world (Chatzoglou & Chatzoudes, 2018). Innovation is the creation, acknowledgment, usage of innovative thoughts and products that benefit can increase firms' performance and competitive advantages (Castaño, Méndez, & Galindo, 2016). Likewise, West and Anderson (1996) comparatively characterize "*innovation as the viable use of procedures and novel products to the manufacturer and intended to advantage it and its partners*" cited by Wong Tjosvold, and Liu (2009, p. 238). Chesbrough (2006) and Laursen and Salter (2006) argued that firms cannot innovate in isolation. Innovation needs the cooperation from different associations such as providers, clients, contenders, colleges, financial speculators, and government offices to obtain thoughts and assets. This open concept of innovation has caused businesses to reconsider and rethink their current innovation management strategy. Based on the open innovation theory, knowledge is no longer oppressed from the company's internal activities, but also from external activities that occur outside of the companies. By promoting innovation, both public and private organizations will be able to produce sustainable competitive benefits (Subramaniam & Youndt, 2005).

2.2 Social Capital Theory

Firms that established good rapport with their customers report better innovation activities through social relationships (Burt, 1992; Atuahene-Gima & Murray, 2007). Anderson et al.

(2010, p. 121) characterized social capital as an “interacting platform of relationship where people obtain resources that are produced by others or social communities so that they are able to enhance organizational efficiency”. Bagley and Hillyard (2014) defined social capital as the relationship between organizations and external institutions, which aids innovation. Nahapiet and Ghoshal (2000) proposed three elements of social capital: structural, cognitive, and relational. The structural component relates to the general example of associations between actors, while the cognitive component refers to the resources providing shared portrayals, understandings, and frameworks of significance. On the other hand, the relational component denotes personal collaboration that individuals formed with others over a contextual marked by teamwork. Yli-Renko et al. (2001) demonstrated further that the three components of social capital to be related. Social capital supports the innovation process by lessening exchange costs among organizations and different performing professionals. For example, searching for information expenses, negotiating, judgment expenses, and monitoring & requirement expenses are tremendously lowered (Lowitt et al., 2014). Other benefits of social capital are presented by Edelman, Bresnen, Newell, Scarbrough and Swan (2004) who found that social capital helps value creation in firms because it assists in acquiring knowledge that is not easily accessible, providing cohesion among community members and establishing trust in mutually reinforcing relationships. Based on the deliberation, the study proposes that social media activities, relationship quality and innovation is interrelated. Also, it is hypothesized that relationship quality mediates the link between social media activities and innovation.

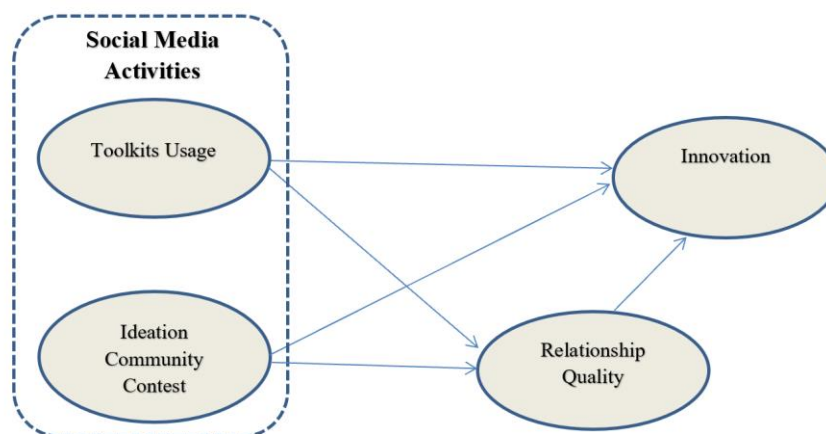


Figure 1: Proposed Research Framework

2.3 Toolkits Usage and Innovation

Toolkits usage for innovation and configuration are user-accommodating and incorporated arrangements of product-planning, constructing, and configuration scanning apparatuses planned for end-user’s utilization (Von Hippel, 2005; Von Hippel & Katz, 2002). The fundamental thought of the toolkits usage method is to move innovation correlated product-plan assignments from the central manufacturer organization to the consumers by furnishing them with online apparatuses and empowering them to alter a product to their specific consumer requirements and inclinations (von Hippel, 2005). The toolkits usage gives a determination of various attributes for product measurement in which consumers can use to design their products. The toolkits usage method was primarily connected in the semiconductor business (Thomke & von Hippel, 2002) and the PC recreations industry (Prügl & Schreier, 2006). Today, it is utilized

in a broad range of industries, including toys, nourishment, and money related administrations on high-incentive accounts. Toolkits usage as opposed to the lead-user involvement or joint effort with user networks throughout publicly supporting activities. The purpose of using the toolkits usage method is to encourage buyers in doing explicit to require associated activities themselves by furnishing them with configuration devices. Schulz, Geithner, Woelfel and Krzywinski (2015) showed that toolkits usage leads to achieve shared comprehension among group members and create imaginative thoughts. Likewise, Tschimmel (2012) claimed that the use of toolkits can improve, quicken, and create imaginative procedures in various organizations. Based on the above discussion, the following hypotheses are developed:

H1: Toolkits usage is significant and positively correlated with innovation.

H2: Toolkits usage is significant and positively correlated with relationship quality.

2.4 Ideation Community Contest and Innovation

According to Johann, Bartl, Ernst and Hans (2004), ideation communities contest is a potential method for the innovation process, provided individuals are proficient and willing to add to virtual co-advancement. Piller et al. (2005) found that joint consumer efforts in innovation networks can produce ideas that are more profitable than conventional R&D approaches. Firms that follow this methodology can exhibit a more effective administration of changing customers' needs by including them in the esteem creation process. Autio, Dahlander, and Frederiksen (2013) found that users attract attention from their peers in the community by coming up with novel and innovative ideas and engaging in technical problem-solving. They observe a positive relationship between ideation community contest and new opportunities. Community members can discover new issues and related solutions and communicate these within the community. Franke and Shah (2003) investigated four independent sports networks and demonstrated that 33 percent of the community individuals improved or even planned their product innovations for game gear. Thus, innovations are not developed exclusively from individual endeavours but by joint efforts with other community individuals.

Keinz et al. (2012) stated that ideation community contests are casual, self-composed (online) systems of users that share data and information about the product of the central maker firm (Franke & Shah, 2003). Rather than contending, consumers established within an ideation community contest every now and again communicate and work together across a product of mutual benefit. As opposed to progressive systems or different types of systems, sharing forms between individuals in ideation community contests are not founded on official agreements however rather on "interpersonal agreements" in the feeling of trust, shared standards and qualities, and general correspondence (Murray & O'Mahony, 2007). Backing to particular user pioneers from their friend community has appeared to be an imperative achievement component (Hienerth, Keinz & Lettl, 2011) as it takes into account aggregate innovation, that is, expanding on the arrangements of others (Murray & O'Mahony, 2007). Ideation community contest facilitates creative exercises in the ideation stage as well as in the next phases of the innovation procedure (Raymond, 1999). Ideation community contest helps in the dissemination of innovation and is beneficial for the modern-organization establishment by user trend-setters, getting them profitable from a marketing point of view (Shah & Tripsas, 2007). Based on the above discussion, the following hypotheses are developed:

H3: Ideation community contest has a significant association with innovation.

H4: Ideation community contest has a significant association with relationship quality.

2.5 Relationship Quality and Innovation

Relationship quality is the psychological component of social capital that indicates basic qualities and a mutual concept (Tsai & Ghoshal, 1998). It depicts the degree to which the desires of parties engaged in the relationship are met (Svens, 2004). Wagner and Sutter (2012) demonstrated that excellent consumer interactions enhance supplier-consumer collaborative innovation execution. Several literatures reveal that relationship quality is dependent on fulfilment and trust (Kühne et al., 2013; Chen et al., 2014). Trusting relationships are vital in industry associations, together with companies and their providers and amongst organizations and their clients. When trust exists among companies and their providers, companies will be more encouraged to collaborate with their providers in developing innovation. Landry et al. (2002) accentuated increments in quality of relationship with the community contributes to improve organizations' innovation. Chiu et al. (2006) expressed that a trusted relationship leads to sharing and trading great quality learning for new improvement of the product. Giovanis, Athanopoulou and Tsoukatos (2015) discovered that relationship quality completely intercedes the service quality and customer loyalty relationship, whereas Keating et al. (2011) discovered that relationship quality partially mediates the relationship between service quality and customer loyalty interaction. Kim, and Cha (2002) found that relationship quality amongst employees and customers can significantly influence service innovation. Based on the above discussion, the following hypotheses are developed:

H5: Relationship quality has a significant association with innovation.

H6: Relationship quality mediates the link between toolkits usage and innovation.

H7: Relationship quality mediates the link between ideation community contest and innovation.

3. RESEARCH METHODOLOGY

3.1 Instrument Development

The measurement scale for toolkit usage was based on the study of Keinz and Schreier (2008). The measurement scale for ideation community contest was adapted from the research performed by Laroche, Habibi, Richard and Sankaranarayanan (2012). Innovation was measured by using a five-items measurement scale, which was developed by Grawe, Chen and Daugherty (2009). The measurement items for relationship quality constructs were adapted from the research performed by Chu, Wang and Lado (2016). All the scales were on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree, and a rating of 3 indicates a neutral response).

3.2 Data Collection

The data was collected from manufacturing organizations located in Klang Valley, Malaysia, which are highly affected by the external relationships (Van de Vrande et al., 2009), are knowledge-driven (Hatzichronoglou, 1997), and have R&D department centered on innovative performance (OECD, 1997). The manufacturing organizations were selected from the Federation of Malaysian Manufacturers (FMM) directory. The target population of the study is those who hold managerial level positions and are involved in the production, operation and development process. A total of 2,400 manufacturers, exporters and service companies' profiles were listed in the FMM directory. From the database, the organizations were selected randomly and the researchers reached them via email and telephone. For each of the organizations, only

one respondent was chosen to answer the survey. In total, 536 questionnaires were distributed through online and face-to-face in which 405 were returned. A total of 393 clean data were used for the final analysis representing a response rate of 68.23 percent.

4. DATA ANALYSIS AND RESULT

To assess data normality, the study evaluated the skewness and kurtosis values for all components. The data distribution for the sample is considered normal as the skewness and kurtosis values for all components were within the range (-1.96 to 1.96 and Multivariate c.r = $4.68 < 8.00$). With regards to multicollinearity, Gujarati (2003) stated that multicollinearity occurs when the tolerance is below 0.1 and Variance Inflation Factors (VIF) is higher than 10. In the study, multicollinearity is not an issue as the VIF value for toolkits usage, ideation community contest, and innovation is between the range of 1.25 and 1.42. To detect non-response bias, a t-test was conducted with the first and last 40 respondents to check the significant difference between the two groups. The study found no significant difference between the two groups, thus, non-response bias in the investigation is not evident.

4.1 Respondent Profile

Out of 393 respondents, most of them were female (64.9%) and within the age of 31-40 years old (51.1%). Based on education, position, and industry categories, the majority of the respondents possess Bachelor degrees (68.20%), Senior Managers (46.30%), and were working in the electronics & electrical industry (33.6%), respectively.

4.2 Convergent and Discriminant Validity

Table 1 indicates the convergent and discriminant validity tests of all constructs. Composite Reliability (CR) for every component is more than 0.7, and Average Variance Extraction (AVE) is higher than 0.5, which indicates the convergent validity of the variables (Hair et al., 2010). Similarly, the correlation result explained that there is a significant and constructive correlation amongst each component. All in all, the result provides evidence that there is no issue on convergent and discriminant validity.

Table 1: Convergent and Discriminant Validity

| | CR | AVE | MSV | MaxR(H) | Relationship | Toolkits | Ideation | Innovation |
|--------------|-------|-------|-------|---------|--------------|--------------|--------------|--------------|
| Relationship | 0.777 | 0.562 | 0.333 | 0.781 | 0.642 | | | |
| Toolkits | 0.816 | 0.639 | 0.214 | 0.890 | 0.448 | 0.652 | | |
| Ideation | 0.882 | 0.584 | 0.333 | 0.941 | 0.577 | 0.463 | 0.696 | |
| Innovation | 0.809 | 0.516 | 0.267 | 0.953 | 0.517 | 0.373 | 0.513 | 0.719 |

4.3 Confirmatory Factor Analysis and Hypothesis Testing

Structural Equation Modelling was utilized to analyse the proposed interactions amongst the variables. The research model proposed toolkits usage, and ideation community contest as the predictor variables, and innovation as the dependent variable. Relationship quality is proposed as a mediator. Initially, the model fit analysis for toolkits usage, ideation community contest, innovation, and relationship quality with all 33 items showed the model was not fit (CMIN/DF = 4.66; CFI = 0.812, which is lesser than 0.9 ; GFI = 0.757, which is lesser than 0.9 ; RMSEA

= .09 which is more than .08). A re-specified measurement model, as shown in Figure 2, indicates the model with 23 items achieved acceptable fit as the CMIN/DF value changed to 1.817 and significant (which is lesser than 5.0; $p < .010$). The CFI and GFI values improved respectively (CFI = 0.945 and GFI = 0.918), while RMSEA reduced to 0.046.

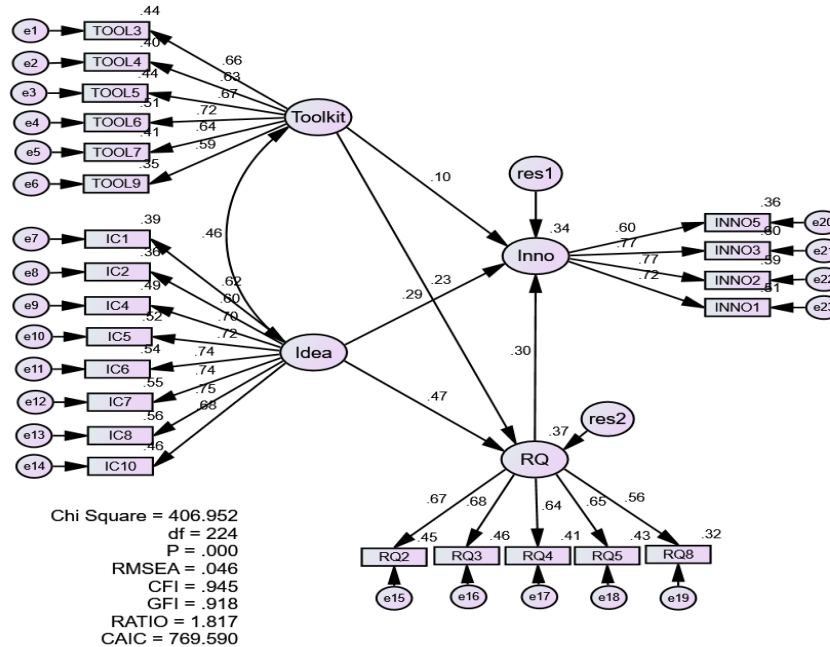


Figure 2: Structural Equation Modelling Analysis

Table 2 demonstrates that toolkits usage, and ideation community contest are significantly correlated to innovation and relationship quality, respectively ($\beta = .115, p < 0.01$; $\beta = .277, p < 0.01$) and ($\beta = .203, p < 0.01$; $\beta = .406, p < 0.01$). Also, it is shown that relationship quality is significantly related to innovation ($\beta = .234, p < 0.01$). Thus, hypotheses H1-H5 are supported.

Table 2: Hypothesis Testing

| Hypotheses | Estimate | S.E. | C.R. | R | p |
|------------------------------|----------|------|-------|------|------|
| Relationship <--- Ideation | .392 | .045 | 8.635 | .406 | .000 |
| Relationship <--- Toolkits | .203 | .047 | 4.307 | .203 | .000 |
| Innovation <--- Relationship | .262 | .057 | 4.570 | .234 | .000 |
| Innovation <--- Ideation | .300 | .056 | 5.333 | .277 | .000 |
| Innovation <--- Toolkits | .130 | .055 | 2.359 | .115 | .018 |

For mediation analysis, Table 3 shows relationship quality has a partial mediating effect on the correlation between toolkits usage and innovation, ideation community contest and innovation, respectively. Thus, it is concluded hypotheses H6 and H7 are partially supported.

Table 3: Testing Indirect Effects (Mediation Variables)

| Paths | Direct without Mediator (P) | Direct with Mediator (P) | Indirect (BC) P | Findings |
|-----------------------|-----------------------------|--------------------------|-----------------|-----------|
| Toolkits → Innovation | .115(.018) | .293(.043) | .017(.000) | Partial M |
| Ideation → Innovation | .277(.000) | .457(.000) | .041(.000) | Partial M |

5. DISCUSSION AND CONCLUSION

This research aimed to examine the effect of toolkits usage and ideation community contest on innovation. Also, this research attempted to analyse the role of relationship quality as a mediator in the formation of innovation. Consistent with the previous studies (Jeppesen, 2002; Prugl & Schreier, 2006; Kärkkäinen, Jussila & Väisänen, 2010; Piller et al., 2011; Groeger et al., 2016), the study found significant positive relationship among toolkits usage, ideation community contest, relationship quality, and innovation. Thus, it is concluded that organizations can use toolkits usage and ideation community contest methods to engage customers in their innovation process. Toolkits usage and ideation community contest could assist manufacturers to increase their innovation capability and reduce the uncertainty of customers' responses to new products. Toolkits usage with social media functionality could help organizations to establish bonds with consumers towards understanding their needs. The findings supported Piller and Walcher (2006) notion that the ideation community contest as a viable platform for idea generation and new product development.

The findings indicate that ideation community contests have a significant influence on relationship quality, which in turn affect innovation. This supports the argument of Bullinger et al., (2010) and Piller et al., (2011) who found ideation community contests as a vital factor to create innovative thoughts and suggestions for the organization without expecting money for their contribution (Ebner et al., 2009). Bjork et al. (2011) stated that the ideation community contest is a type of competitive mechanism of a relationship strategy for fostering the customer innovation process. Landry et al. (2002) claimed that the increase of trust through community interactions tends to improve green service innovation. This assertion was further validated by a recent study that shows relationship quality as a key element for product innovation, especially with key consumers (Lin & Chen, 2018). In the situation where the quality of relationship is high, customers tend to take additional responsibilities to contribute to the product innovation procedure. The outcomes of this study recommend a partial intervening impact of relationship quality between the relationship of social media activities and innovation (Mitręga, 2012; Giovanis et al., 2015; Chu et al., 2016; Lin & Chen, 2018). The reason for this is that there could be other factors that have a significant impact on the formation of innovation.

From a practical standpoint, this study reinforces the customer contribution in the organization's innovation procedure through the empirical investigation of toolkits usage and ideation community contest. Both toolkits usage and ideation community contest components have substantial impacts on product innovation and similarly on relationship quality. Second, the findings provide a positive sign for practitioners to create innovative products through toolkits usage and ideation community contest. Third, this study offers support to the promotion of toolkits usage and ideation community contest in Malaysia context. Thus, there is great potential to market toolkit-based products. Franke and Piller (2004) stated that consumers are more likely to pay a premium price for a self-designed product. From a theoretical standpoint, the findings add to the literature of toolkits usage, ideation community contest, and innovation. Consistent with the work of Singh et al. (2016), the study strengthens the notion that firms should involve various parties especially consumers in their innovation process. Although this study provides various contributions, still some limitations should be addressed. The investigation is limited to a specific area which only covers the manufacturing organizations in Klang Valley, Malaysia. Thus, the findings of the study might not be totally applicable to other sectors of the economy. Future research is encouraged to extend the study by examining other possible factors that might contribute to innovation in the service industry. Moreover, a

comparison study of innovation development in the manufacturing and service sectors is suggested to determine whether there are any significant differences between both. Certainly, the outcomes of the study would be valuable as it further enriches our understanding on innovation mechanisms across various sectors of the economy.

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