

OSMNs-enabled Knowledge Management for New Product Development and its Success

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Abstract: *In recent years, knowledge management of new product development (NPD) has received scholarly attention among the researchers as an important mechanism to ensure the success of a new product (NP). But, the extant literature does not explicitly discuss on management of external knowledge resources and use of online social media networks (OSMNs) in the NPD knowledge management process. To fill this gap, the current study, adopting subjective/argumentative research strategy, presents a framework for thinking about management of external knowledge resources using OSMNs to achieve new product success. Drawing on the knowledge based view, this research focuses on the OSMNs-enabled knowledge management process, two antecedents (leadership style and strategic integration) and consequence of this process. After developing the conceptualization of the variables to be researched, and examining the relationships among these variables, the study presents a series of propositions. Finally, a theoretical framework has been developed, and its implications for NPD knowledge management in pursuit of new product success and organizational practices have been discussed.*

Keywords: *New product knowledge management, online social media networks, leadership style, strategic integration and customer acceptance*

1. Introduction

The capability to develop successful new products (NP) is regarded as central to competitive success for firms (Gonzalez & Palacios 2002). Studies from knowledge based perspective emphasize on the importance of new product development (NPD) knowledge resource on NP success (Kim et al. 2013; De Luca & Atuahene-Gima 2007; Moorman & Miner 1997; Nonaka & Takeuchi 1995). Teece (1998) indicates that a firm must accumulate superior capabilities related to acquiring and applying knowledge resources to develop creative NP. This acquisition of knowledge may come from both internal (e.g. employees) and external sources of a firm: customers, channel partners and suppliers (Slater and Narver 1995). Day (1994) also asserts the importance of external emphasis (represented by outside-in) for gaining competitive advantage.

Although there are many studies (e.g., Kim et al. 2010; Teece 1998), that deal with the internal knowledge sources of NPD teams (for example: individual team members, cross-functional teams, etc); there is, however, limited understanding and empirical evidence of how the external sources (for example: customers, suppliers etc) can be capitalized into NPD knowledge management process and thereby contribute to new product success. Dahan & Hauser (2002) highlighted that firms can engage with their virtual customers for utilizing the creativity of diverse users from all

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over the world. Realizing the growing trends of social networking sites (SNS) and social media as well as its user community, this paper considers these online user community as external knowledge source for NPD and incorporates online social media networks (OSMNs) with knowledge management process to influence NP success. Online user community, in this paper, is defined as individuals who participate in OSMNs to post, comment on or share ideas and events, and interact with other members to form communities around shared interests.

Michaelidou et al. (2011) claim that despite the immense popularity and use of SNS, systematic research on the use of SNS in shaping commercial online interaction is very limited. Similarly, the researchers found that the previous studies on the application of SNS and/or social media in the field of marketing strategy is limited in numbers and mostly focusing on how marketers can use them as effective promotional and communication tool (e.g., Mangold & Faulds 2009). Although some studies indicate how to target innovative users for NPD through social media (e.g., Nambisan 2002; Nambisan & Baron 2007; von Hippel 2002; Dahan & Hauser 2002; Hung et al. 2011), the way in which these innovative users contribute to NPD and thereby NP success, still lacks in extant literature. Hence, this study fulfills this knowledge gap by addressing the following research questions: 1) *How do OSMNs contribute to NPD knowledge management process?* and 2) *How does this process in turn affect NP success?*

So, the objectives of this study are three-fold: to establish a relationship between OSMNs-enabled NPD knowledge management process and NP success, to identify moderator(s) for this relationship and to find the key antecedent(s) of OSMNs-enabled NPD knowledge management process. This view will provide organizational decision makers with clear understanding of the importance of OSMNs-enabled NPD knowledge management for driving NP success and will provide strategic directions to the firms to successfully practice this.

This study is not intended to be comprehensive, but suggests some central themes that can be used to stimulate further discussions and future research in the field of information systems and marketing. Some propositions are developed with supporting arguments from the previous research. Finally, a conceptual framework (fig. 1, p. 4) has been developed to show how OSMNs can be successfully integrated in the NPD team for knowledge management with a goal of achieving NP success.

2. Theoretical background and development of propositions

This study builds on the conceptualization of *knowledge based view of the firm* where knowledge is considered as an asset as well as a critical source of competitive advantage (Spender and Grant, 1996; Kohlbacher, 2007), and the conceptualization of *organizational knowledge creation* as proposed by Nonaka (1994). According to Nonaka's SECI model (socialization, externalization, combination and internalization) the interplay between tacit and explicit knowledge leads to the creation of new organizational knowledge. According to Nonaka and Takeuchi (1995), explicit knowledge is formal and systematic, and can be easily communicated expressing in words and numbers, and shared in the form of hard data, scientific formulae, codified procedures or universal principles; while they describe tacit knowledge as something not easily visible and expressible, highly personal and hard to formalise. They continue further saying that subjective insights,

intuitions and hunches fall into this category of knowledge. The present study takes the first two knowledge creation mode of the model, *socialization* (sharing tacit knowledge through informal communications or shared experience) and *externalization* (making tacit knowledge explicit, thus allowing it to be shared by others). Third and fourth mode- 'combination' (combining different types of explicit knowledge) and 'internalization' (knowledge receiving and application by an individual)- which do not relate OSMNs user community (external source) interaction are beyond the scope of this study. By definition, they are more relevant for knowledge creation and application within the organization's boundary and thus, are not considered here.

The following section briefly explains how prior researches have laid the foundation for developing relationship among the constructs and the proposition concerning those relationships.

2.1 OSMNs and knowledge management for NPD

In this study, OSMNs have been used as an enabler of NPD knowledge management process. Instead of using the term SNS or social media, which have been applied interchangeably in different literature, this paper uses OSMNs, *which leverage both social media and social networking by supporting easy web publishing and social interactions of online users* (Gu et al. 2011). In fact, the distinction between SNS and social media is fast disappearing and both are adopting some distinct features of other.

For example, SNS sites are adding primary features of social media sites features (i.e., the sharing of UCCs); and social media sites are adding primary features of social networking sites, (i.e., personal profiles and forming communities) (Kim et al. 2010). This study conceptualizes the application of OSMNs in NPD knowledge management as *a process which is strategically designed and developed, focusing on user advocacy and excellence, not just mere conversations or engagement in internet in general.*

With the fast development of Web 2.0 technologies and the rapid growth of online population, OSMNs have become increasingly popular since it make possible formation of online communities, communication and tie among members of these communities and the sharing of user created contents (UCCs). Examples of OSMNs include Facebook, YouTube, MySpace, Flickr, Twitter, LinkedIn, Hi5, Google+ etc (Stelzner 2012). Many business firms are taking advantage of OSMNs because it offers vast opportunity of extracting business benefits at low cost. Kirtiş and Karahan (2011) found social media marketing is the most cost effective marketing strategy. It can be used to market their products (Rosen 2009; Kim et al. 2010) through posting product release announcements, images, promotional videos, or to interact with customers as well as to manage customer relationships (Rosen 2009; Kim et al. 2010; Hun 2010). Firms can create virtual customer environments to tap into customer knowledge through an ongoing dialogue (Nambisan 2002; Sawhney & Prandelli 2000).

Firms can engage with customers for utilizing the creativity of diverse users from all over the world (Dahan & Hauser 2002). The survey of 2012 Social Media Marketing Industry Report over 3,800 marketers, found that a significant 65% of marketers indicate social media usage for marketplace insight (Stelzner 2012). Therefore, OSMNs are no doubt an important tool for knowledge acquisition from and knowledge sharing as well as knowledge creation with user

community. User community is defined as individuals who participate in OSMNs to post, comment on or share ideas and events, and interact with other members to form communities around shared interests. For example, bloggers, registered user in the company fan page in OSMNs, specialized user community who post their thoughts, innovations for others to comment on, download, use and improve (von Hippel 2005). So, user communities include current customers as well as potential customers, since user communities could be converted to the potential customer if firms can successfully track and analyze them and can provide product with appropriate value they are looking for.

2.1.1 OSMNs-enabled knowledge management for NPD

Ranjan and Bhatnagar (2011) claim that information from customer can be effectively gathered and utilized if the methods used allow ease and quick interaction with customers. In this perspective, OSMNs have the easiest and quickest possibility of interaction with the customers as well as the user community. This customer information will be transformed into knowledge if it is used timely and accurately. The process-centered approach of knowledge management treats knowledge management as an interpersonal communication process (Mentzas 2003). This paper considers 'knowledge acquisition' (Tiwana 2002; Kohlbacher 2007) and 'knowledge creation' (Nonaka 1994) as two important dimensions of NPD knowledge management processes which are relevant for taking advantage of external knowledge sources of a firm. Previous studies (e.g., Campbell 2003), also stress on these two dimensions by stating that firms need to be better at generating customer knowledge than at utilizing it. In addition, other knowledge management dimensions such as 'knowledge utilization' is applicable solely within the organizational context and thus, not relevant for user community interaction. So, only knowledge acquisition and creation dimensions are considered in this study. This paper conceptualizes OSMNs as a *NPD knowledge management tool that helps create new knowledge by sharing knowledge with external sources and facilitates knowledge acquisition from them (user communities)*.

NPD knowledge acquisition is defined here as *capturing the knowledge, related to existing product, of the user community that allows firms to refine and extend its existing knowledge base*. NPD knowledge creation on the other hand, is defined as *the generation of totally new knowledge in association with user community*. McAdam et al. (2006) highlight the access and integration of external knowledge sources for knowledge creation. Similarly, Kohlbacher (2007) states that knowledge is created by the organization through interaction with outside constituents from the knowledge they held. It enables communication of the tacit knowledge possessed by customers that they themselves have not been able to articulate but reflected in their actions as well as in words, and what they fail to state though feel deeply, and even take for granted (Chambliss et al. 2012). Thus, this paper conceptualizes NPD knowledge creation as the identification of ideas, insight, knowledge of product from user community by interacting and sharing information and knowledge (both tacit and explicit) with them. According to Nonaka (1994), knowledge is created by socialization meaning informal face-to-face interaction, i.e., through an exchange of tacit knowledge (tacit-to-tacit). This happens by sharing ideas, making joint hands on experience, spending time together etc. Thus, OSMNs make socialization possible in which both the firm and user community from all over the world can interact in a time and cost efficient manner without

being involved in face-to-face communication. In this way, this study claims that socialization does not necessarily requires face-to-face interaction. Externalization- the act of codifying tacit knowledge into explicit knowledge, is another knowledge creation mode, and is also possible by OSMNs because many experts' opinion along with users' created contents can be accessed which is explicit in nature.

2.2 Antecedents of OSMNs-enabled knowledge management for NPD

2.2.1 Leadership style

Prior research on leadership-innovation-change relationships provides strongest evidence that based on the extent of change instigated within the organizational or team level setups, leaders may employ any of the two styles: transactional and transformational. Transactional leaders are more relationship and participative oriented, and avoid drastic change. On the other hand, transformational leaders are directive and task-oriented, more open to change and stimulate team members' intellects by encouraging them to see problems from a new perspective and to use untried approaches (Templeton et al. 2012). While analyzing leadership style of online social network leaders, Templeton et al. (2012) suggest that those leaders engage in one of these two styles. Based on the organizational learning theory they advocate that transactional leaders are those who use their online social network to stimulate incremental change and communicate with their group in ways that demonstrate SLL (i.e., Single learning loop- related to incremental and preprogrammed change, and does not challenge prior organizational assumptions). Conversely, transformational leaders use their group as an opportunity to stimulate radical change and operate their online social network in the DLL (i.e., double learning loop-related to radical change, and challenges organizational values). In another research, Rosing et al. (2011) propose an ambidexterity theory of leadership for innovation, stating that a single leadership style cannot promote innovation effectively. Instead, a combination of different leadership behaviors flexibly applied to changing requirements within the innovation process is more effective. In this respect, transactional and transformational leadership styles are applied as two complementary leadership styles in this study. Adopting OSMNs in NPD knowledge management process may either entails a radical change in existing process and values or may entail a simple addition as a part of its existing incremental change process. So, according to the degree of change sought, leaders tend to implement either strategy or combination of these two.

Since OSMNs-enabled NPD knowledge creation is about formulation of new NPD knowledge, it is more tilted towards exploratory innovations which challenge institutionalized learning and aimed to respond to latent environmental trends by creating innovative technologies and new markets (Lubatkin et al. 2006). Thus, it is resulted from search, variation, flexibility, experimentation and risk-taking (March 1991) involving the user community. In this sense, transformational leadership will facilitate NPD knowledge creation while transactional leadership will facilitate OSMNs-enabled NPD knowledge acquisition and will hinder NPD knowledge creation. In contrast, NPD knowledge acquisition is resulted from the repetition, replication, and incremental improvements in established practices and products (March 1991) through involving the user community. Thus, both transactional leadership as well as transformational leadership

will facilitate OSMNs-enabled NPD knowledge acquisition. These considerations lead to the following propositions:

Proposition 1: *Transformational leadership a) positively influences OSMNs-enabled NPD knowledge acquisition and also b) positively influences OSMNs-enabled NPD knowledge creation.*

Proposition 2: *Transactional leadership a) positively influences OSMNs-enabled NPD knowledge acquisition where as b) negatively influences OSMNs-enabled NPD knowledge creation.*

2.2.2 Strategic integration

Social Media itself cannot contribute to the value expected to be added in the NPD knowledge management process. Integration and coordination with other functional resources of the firm are essential. Besides, knowledge management, in recent years, has become a dominant area in strategic management (Kohlbacher 2007). So, OSMNs strategy, knowledge management strategy and different functional strategy should be integrated for proper functioning of OMNs-enabled knowledge management process. In addition, functional integration can lead to a more effective and more efficient use of resources, as it can reduce coordination problems between different resources in the NPD (Griffin & Hauser 1996). This paper identifies IT strategy integration and marketing strategy integration as two important antecedents for OSMNs-enabled NPD knowledge management process.

2.2.2.1 IT strategy integration

Alavi and Leidner (1999) contend that firms should integrate their IT with their organizational knowledge management strategies and processes in order to survive in their highly competitive business environments. Consequently, OSMNs-enabled NPD knowledge management also requires proper integration and coordination with relevant IT resources (both information technology and IT professionals). For example, those firms wish to employ OSMNs in NPD knowledge management process should prepare the contents to be shared professionally, should dedicate qualified employees to manage their presence on OSMNs to deal with user comments and requests, weigh the drift of reactions from the users, etc., because negative reactions on OSMNs can spread widely and quickly (Kim 2010). Business firms can integrate different Web toolkit with the OSMNs to listen to what people are saying online. Firms can easily trace and monitor customer conversation in company fan page in OSMNs, chat room, specialized blogs. However, some listening tools (e.g., Radian 6) can be used as a complementing method into which data is entered, in the form of keywords or phrases that the company wants to monitor and listen what people are saying about them online. The listening tool then searches multiple OSMNs (Twitter, YouTube, Facebook and others) for that information and returns all of the relevant results to the person(s) responsible for handling the incoming responses. The person(s) then decides how to respond to the information that was received (Morgan 2010). In addition, data and text mining techniques with appropriate filtering technique, and decision support systems need to be integrated to look for patterns in customer data to inductively create knowledge (Ranjan & Bhatnagar 2011). Based on these related previous research, this paper suggests IT- strategy integration as an antecedent for the NPD knowledge management through OSMNs to achieve NP success. Hence, the proposition is:

Proposition 3: *IT strategy integration positively influences OSMNs-enabled NPD knowledge management process.*

2.2.2.2 Marketing strategy integration

OSMNs-enabled NPD knowledge management strategy should also be integrated with the marketing strategy of a firm. Since NPD team works as a sub unit of marketing, marketing unit is also responsible for NPD functions and they use OSMNs for sharing company and product information with the user community. So, this interdependency suggests that the integration of marketing strategy with OSMNs-enabled NPD knowledge management strategy have a positive effect on the effectiveness of NPD knowledge management. Thus, this paper predicts:

Proposition 4: *Marketing strategy integration positively influences OSMNs-enabled NPD knowledge management process.*

2.3 OSMNs-enabled knowledge management for NPD and NP success

The importance of knowledge management in the product innovation process has been recognized in prior researches. Dannels (2002) shows that for an innovative product to be successful, a company must link technological competence with customer competence such as knowledge of customer needs. Lack of familiarity with NPs may influence customers' resistance to the product because of the —fear effect (Veryzer 1998). NPs that are developed based on OSMNs-enabled NPD Knowledge Management, may understand customers' view and experiences so as to meet their needs. More importantly, in the process of communication, customers become more familiar with the new product. Nambisan and Baron (2007) studied on the value creation process of virtual customer environments (VCEs) and suggest that customers' perceptions of interaction-based benefits will shape their future participation in product support in the VCE. So, their findings develop an important insight about how customers' involvement in NPD knowledge creation, acquisition and sharing ultimately leads to more market acceptance of the NP. Customer involvement also has been shown to improve the effectiveness of the product development process (Cooper et al. 1987), increasing the quality level of new products and reducing the time to market. However, this study is not restricted to the individual firm's privately owned dedicated VCE (e.g., Peugeot VCE, Microsoft's VCE, IBM VCE); rather the focus is on a broad horizon of online user community as well as the customers from all over the world who will participate in communication with firms through OSMNs.

NP success can be measured from different perspective. Based on the survey result of the Product Development Management Association (PDMA), Griffin and Page (1993) develop three dimensions of NP success: 1) customer acceptance measures 2) financial performance measures 3) product or technical measures. Huang et al. (2004) use the same measure to investigate the success criteria used by Australian SMEs and conclude that customer acceptance, customer satisfaction, product performance goal achievement, and quality goal fulfillment are the most frequently used success criteria for them. Interestingly, all of these measures are non financial. They claim, understanding customers, is very important to the new product success of SMEs. Hultink and Robben (1995) prove that customer acceptance and financial performance are two important criteria for measuring long term success of a firm's product.

However, most studies use financial measures to evaluate NP success (Ahituv et al. 1998) because of its objectivity. Considering the limited research effort on customer acceptance as a NP success dimension, although an important determinant of NP success, this paper adopts customer acceptance dimension of NP success to find the relationship between OSMNs-enabled NPD knowledge management and NP success. Following Griffin and Page (1993), and Huang et al. (2004) both subjective customer acceptance (i.e., subjective and perceptual measure that are not financially oriented, e.g., the customers are happy with the product) and objective customer acceptance (i.e., financially based customer acceptance, e.g., new product achieved budgeted sales) will be measured. The measurement will be based on how the NPD teams perceive that their new product has been accepted by the customers and also been collected from the financial and sales records of the firm. Here, we hypothesize that:

Proposition 5: *OSMNs-enabled NPD knowledge management positively influences customer acceptance.*

2.4 Moderator

2.4.1 Users' trust and willingness to participate in OSMNs

This study assumes that users' trust in OSMNs affect their intensity of information and knowledge sharing through OSMNs and thereby affect NP success. Besides, misstep in use of social media by company employees, false or inaccurate information circulating through social media, or misuse of corporate trademarks, present potentially serious, long-lasting negative impact on a company's brand and reputation (BITS 2011). These eventually affect users' trust and participation in conversation and knowledge sharing with the company and thus, affect the relationship between NPD knowledge management and NP acceptance. So, this consideration leads to following propositions:

Proposition 6: *Higher degree of user trust and willingness strengthen the relationship between OSMNs-enabled NPD knowledge management and NP acceptance and vice-versa.*

3. Methodology

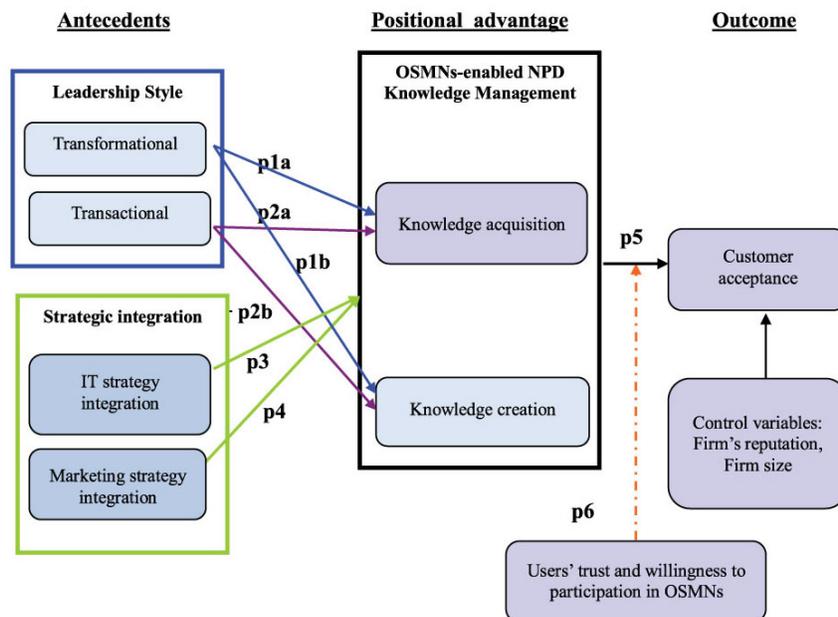
Our philosophical stance for this study was interpretivist (Walsham 1995) and we adopted subjective/ argumentative (Galliers 1992) research strategy for this study. This approach is widely adopted in information systems (IS) research (Siponen & Willison 2007; Galliers 1992) and it is argued that the process can be applied to existing body of knowledge for creating new ideas and insights (Vogel & Wetherbe 1984). According to Galliers (1992), "this kind of creative process makes a valuable contribution to the building of theories which can subsequently be tested by more formal means" (p. 157). Hence, we reviewed the relevant literature in IS and marketing, and based on discussion and argumentation with the extant knowledge, we have asserted few propositions. Finally, we contribute to the cumulative knowledge of IS and marketing literature by proposing a theoretical framework for management of external knowledge resources using OSMNs which would facilitate new product development and success.

4. Proposed conceptual framework

Following Day and Wensley (1988), 'the source-position-performance framework' is adopted while developing the conceptual framework, as in Figure 1, where leadership style and strategic integration are the source, OSMNs-enabled NPD knowledge management is the positional advantage and NP acceptance is the performance outcome.

This study argues that OSMNs could be used successfully in the NPD knowledge management process; and for proper functioning of this process, NPD team leaders should adopt appropriate leadership style. OSMNs strategy, knowledge management strategy and different functional strategy should be closely integrated. Since the NPD team makes the current and potential consumers engaged in the new product development process, the possibility of acceptance of those products from a wide range of customers become higher, ultimately leading to new product success.

Figure 1: Proposed conceptual framework



5. Discussions and Conclusion

The conceptual research work presented here was originated from the concern that the growing literature on NPD knowledge management and social media lack explicit focus on the role of social media in the knowledge management process for NPD team. This study argues that OSMNs enable NPD teams to engage their customers in the knowledge management process for new products. Firms can share its product related information in terms of posting promotional videos, submitting articles, press releases, reviews, product launch, announcements and so ones as

contents, and can get potential customers' discussions on products and their feedback in the form of comments and reviews. Thus, this paper argues the advantage of external knowledge sources for NPD, which in turn will bring NP success in the short run and competitive advantage in the long run.

However, the support for the ideas and concepts developed remains anecdotal in the absence of a systematic empirical research. While it adds knowledge in the cumulative knowledge, this sort of argumentative and conceptual research is considered to be the first step in building new theories (Galliers, 1992). Accordingly, the propositions developed are intended as a series of testable hypotheses, and one of the implications of this article is to stimulate further research where there are opportunities for demonstrating empirically validated research effort. Future research in this area should provide rich insights through exploration of the propositions presented in the current research as well as introduce new ones including dimensions those were beyond the scope of this study. This study explores external sources for knowledge creation and acquisition. Therefore, the application and effect of this NP knowledge at NPD team is beyond the focus of this study and remains as a potential field for further research. While determining the leadership style, followers (NPD team members) should be studied in future studies because it is difficult to define the leader based on self reported data. Again, the inclusion of some other influencing factors like organizational culture, innovativeness can help draw implications for the development of organizational structure to support OMNS-enabled knowledge management. However, generalizability of the outcome of the research will be somehow limited due to the fact that the knowledge created are related to specific user groups, as users who are not traditionally active in online social media might remain unaddressed.

Finally, proposed framework of this research will be useful not only for researchers engaged in the study of NPD knowledge management and NP success, but also for managers who want to lead their organization to achieve competitive advantage by offering new and successful products in the market. One important implication of this research is the realization that focusing on the customers (current and future) is the ultimate source of competitive success and such focus must transcend across the NPD team of the organization. The proposed framework will also be helpful for practitioners involved in design, operation and maintenance of OSMNs for NPD teams, more specifically for NPD knowledge management process. Finally, the study will provide decision makers with improved understanding of the importance of OSMNs-enabled NPD knowledge management for driving NP success and will present strategic directions to the firm to successfully practice this.

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