The Impact of Proficiency of Marketing Activities and Value Proposition Innovation on New Intelligent Products' Performance

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Abstract

Industrial products' manufacturing businesses are experiencing a change due to emerging need for intelligent products. Intelligent products are a new archetype of products having two layers. The first layer contains the classical hardware products augmented with intelligence on second layer. Intelligent products have a built in human - machine interface to interact with end users. Development and monetization of new intelligent products is a challenge as they subtly move the product business towards the solution business. Hence, it is critical to understand the determinants influencing new intelligent product performance in the market. The study synthesized the literature related to classical, intelligent products that identified marketing activities' proficiency and value proposition innovation as key variables critical for new intelligent product performance. The study was conducted during the year 2018 – 2019, collected data from 54 respondents having managed development and monetization of 42 new intelligent products launched during the years 2011 – 2017 belonging to 32 business units. It empirically validated the structural relationships between marketing activities' proficiency, value proposition innovation, and new intelligent product performance. The study deciphered that marketing activities' proficiency influenced the new intelligent product performance through value proposition innovation. It offered an empirical framework to attain unique value propositions and superior new intelligent product performance. The study suggested the practitioners to deploy a mechanism integrated with marketing activities and value proposition innovation to evolve unique value propositions. It also offered a unique framework of marketing activities' proficiency and value proposition innovation in the context of new intelligent product performance for further investigation by academicians.

Keywords : **marketing proficiency, value propositions, new product performance, intelligent products**

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The increasing need for industrial automation resulted in intelligent products. From 2000 onwards, technology trends with an increasing presence of advanced information sciences and sensing technologies have increased their relevance to industrial markets with unique value propositions. Intelligent products that evolved are a combination of existing classical products with embedded intelligence. Intelligent products with value added features are oriented to enhance reliability, productivity, miniaturization, and safety (Mühlhäuser, 2017). In addition to this, the consideration of the human – machine interface factors led to ease of product use,

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safety, and increased benefits to the end user (Hinterhuber & Snelgrove, 2016). Further advancement of industrial automation with the human – machine interface led to a new stream of products with creative user interfaces. Intelligent products transformed the classical product business to a solution-oriented business offering unique value propositions (Cronin, 2010 ; Dawid, Decker, Hermann, Jahnke, Klat, König, & Stummer, 2017; Lapierre, 2000 ; Nunes, Pereira, & Alves, 2017). This subtle shift towards a solution - centric business poses a challenge to industrial intelligent product manufacturing businesses to attain new - product successes. Hence, understanding the determinants influencing new intelligent product performance (NIPP) is significant to the practitioners of industrial intelligent product manufacturers.

Intelligent products contain two key components : first, a classical physical hardware component referred to as 'asset' ; second, a set of components including controllers, intelligent human machine interfaces (HMI) with embedded software, referred to as 'intelligence' (Främling, Holmström, Loukkola, Nyman, & Kaustell, 2013 ; Habib, 2007; Meyer, Främling, & Holmström, 2009).

A comprehensive research is available on the determinants of classical new product performance (NPP). The type of market orientation and its influence on the NPP has been extensively studied by the marketing academia and practitioner fraternity for several decades. Several studies established the relationships among these variables and NPP (Kohli & Jaworski, 1990).

During the third industrial revolution, industrial intelligent automation products with embedded software fostered by cutting edge information technology (IT) evolved. The widely discussed perspectives related to intelligent products shared in literature are market orientation of the product manufacturing firms (Kok, Hillebrand, & Biemans, 2003) and developing products with unique value propositions (Murthy & Kumar, 2015 ; Payne, Frow, & Eggert, 2017).

New intelligent product performance is primarily driven by value propositions addressing the critical needs of end users of the products. Hence, it is vitally important while developing such products to gather un-addressed needs, extrapolate the current usage, and develop new products with unique value propositions. Several research articles have been published expressing the importance of value proposition innovation for the success of intelligent products (Dillon, Lee, & Matheson 2005 ; Hudadoff, 2009 ; Frow & Payne, 2011 ; Lindič & Marques da Silva, 2011). Literature review in this article identifies that the proficiency of marketing activities and value proposition innovation are critical to NIPP.

An empirical study has been conducted using data collected from 54 practitioners having managed development and monetization of new intelligent products, and this study establishes the structural relationships between proficiency of marketing activities and value proposition innovation. The study empirically validates that the proficiency of marketing activities significantly influences unique value propositions of intelligent products. The study establishes that the influence of the marketing activities' proficiency is manifested through value proposition innovation. It suggests an integrated mechanism combining activities of marketing and value proposition innovation for developing new intelligent products with unique value propositions to attain superior NIPP.

Scope and Methodology of the Study

Firstly, the study conducts a literature review focused on published research related to NPP ; variables influencing NPP ; and perspectives deciphered in literature related to intelligent products, embedded products, and internet of things. The literature review highlights the criticality of type of orientation towards market and organizational processes to convert the voice of customers to products with unique value propositions. Secondly, the conceptual framework and hypotheses are defined. The study gathered the data from the respondents who managed development of intelligent products launched from the years 2011–2017. It also empirically validates the

hypotheses establishing the structural relationships among the variables. Lastly, the study suggests the managerial implications, limitations of the study, and scope for future research.

↳ **Contributions and Findings :** The study identifies variables influencing new intelligent product performance (NIPP). Along with establishing the structural relationships, it deciphers that value proposition innovation mediates the effect of marketing activities' proficiency on the NIPP. It presents a novel framework of MAP–VPI – NIPP. The study suggests a mechanism to ensure integration of unique value propositions with new intelligent products to attain superior NIPP. The study is a novel attempt to answer the below research questions.

↳ **RQ1 :** Does the proficiency of marketing activities effect value proposition innovation ?

↳ **RQ2 :** Does the proficiency of marketing activities and value proposition innovation influence NIPP ?

Study of Prior Research

During the last four decades, an exhaustive literature is published related to traditional products. The literature published presented the challenges associated with new product performance in the context of these traditional products, which were not having intelligence. During 2000, with the rise of intelligent products, several literatures expressing the perspectives about the factors influencing the new intelligent products' performance were published. Important perspectives expressed in the literature are related to embedded products, industrial automation, and edge intelligence. This is mostly related to : (a) ability of the intelligent product manufacturing firms to perform marketing activities proficiently, (b) capability of the product manufacturing firms to deliver unique value propositions that matter to customers.

(1) Proficiency of Marketing Activities and Understanding the Latent Needs of Customers : The context of intelligent products brings in the value offered by the product manufacturers that shapes the market with new types of offerings (Baur & Wee, 2015). Intelligent products augmented with unique values are offered by the product manufacturers – these have the ability to shape the market with new types of offerings. Baur and Wee (2015) presented the new concepts of offerings, including selling equipment as service, product subscription sales, and 'pay-by-use methods.' Conceptualizing these solutions and augmenting them in hardware products requires unique ways to capture the voice of customers. Intelligent products shift the nature of business of a product manufacturing firm – from product to solution centric (Allmendinger & Lombreglia, 2005 ; Masood, 2010). This requires a proficiency in marketing activities, which can forecast the future needs of the market and customers (Blankson, Cowan, Crawford, Kalafatis, Singh, & Coffie, 2013 ; Bloch, Pigneur, & Segev, 1996 ; Sharma & Verma, 2017 ; Zhang & Duan, 2010).

Intelligent products, driven by cutting edge intelligence, hold the capability to house local intelligence and data storing capability. This capability of intelligent products expands the value created by the classical products with an ability to interact with the end users. The current end user generation being millennials, who are also known as 'digital natives,' are expanding the adoption of these products. Designing a user-friendly interface needs a laser focus on the marketing activities' proficiency (Aghazadeh, 2015). Intelligent products delight the industrial customers and help product manufacturers in retaining customer loyalty (Lucke, Constantinescu, & Westkämper, 2008 ; Rijsdijk, Hultink, & Diamantopoulos, 2007). The marketing academia and practitioner fraternity has published several articles related to the market orientation and discussed about the criticality of the style of marketing to enhance new product performance. Several researches focusing on latent insights of customers found that unspoken pains and gains are critical to the success of intelligent products (Levitt, 1981; Savić, Pitić, & Trbovich, 2016). Market orientation can be reactive or proactive, which influences new product performance. The

proficiency of marketing activities was defined by Harmancioglu, Droge, and Calantone (2009) and was measured by a 5 – item scale.

(2) Value Proposition to Customers : 'Value proposition' is a terminology which originated during a project driven by McKinsey & Co as a notion in the year 1980 (Bower & Garda, 1985). Later on, many researchers explained the value proposition further as benefits offered by suppliers to customers for which customers will be ready to pay, which acknowledges the value created by the customers (Lanning, 1998). Value proposition is the preliminary definition of what product offering will be and in what form customers may use it (Chesbrough & Rosenbloom, 2002).

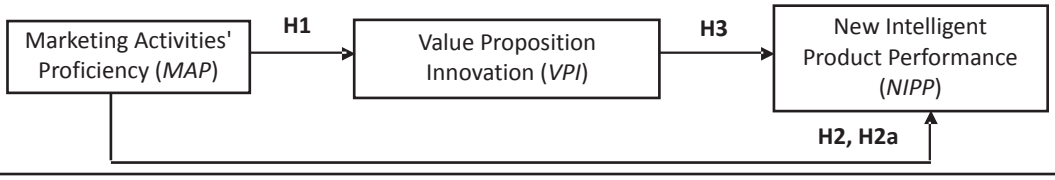
Intelligent products create multiple layers of values, with the primary set of value creation happening through the hardware loop. The secondary set of value creation happens through the information loop. Cutting edge intelligence creates additional value propositions that can reduce bottlenecks as well as wastage through the embedded technologies and may lead to co-development activities (Kowalkowski, Ridell, Röndell, & Sörhammar, 2012). These values generated by intelligent products address the pains and gains of customers collected during the preliminary marketing study stage during the new intelligent product development. Intelligent products improve the value creation – both external and internal – for product manufacturing firms. The external value is for the customers and internal for the manufacturing and monetization processes. Value propositions are the key drivers of customer value and are also the unique features of the intelligent products developed. Some of the researches defined value propositions as a group of unique products and services bundled and offered with a well - articulated communication of benefits to customers. Studies have also explained the importance of value proposition communication to customers (Anderson, Narus, & Van Rossum, 2006 ; Ballantyne, Frow, Varey, & Payne, 2011; Bashir, Yousaf, & Verma, 2016; Oliva & Kallenberg, 2003). Value propositions are portfolios of solutions and how uniquely they are offered, and the process of offering begins with articulating a value proposition latent in new technology (Johnson, Scholes, & Whittington, 2008 ; Yang, Moore, & Chong, 2009). The process of creating unique value proposition was studied by a research conducted by Clauss (2017). The value proposition creation process was defined as value proposition innovation and was measured with a construct of 12 items. The scale captured the ability of the firm to create value innovation with due consideration of new customers, new markets, new channels, and customer relationships.

(3) New Intelligent Product Performance : Several studies reported various measures for new product performance with the new products' success measured based on different criteria. The most popular include organizational performance, sales growth, and profitability at the organizational level. Few of the measures are at the product level – like new product success including sales share of new products (products launched during last 3~5 years) and market share captured (Langerak, Hultink, & Robben, 2004). This study adopted a scale proposed by Guo, Wang, Hao, and Saran (2018) to measure the new intelligent product performance. Hence, the study selected the variables – marketing activities' proficiency (MAP) and value proposition innovation (VPI). The study establishes the structural relationships and explains the criticality of implementing MAP and VPI to attain superior new intelligent product performance (NIPP).

Conceptual Framework and Hypotheses

(1) Research Problem : The literature review reveals that the most critical aspects for attaining superior NIPP are understanding the needs of customers and translating them into unique value propositions. Challenges associated with identifying the unique value propositions and how to leverage market activities' proficiency to enhance value proposition innovation raised the need for an empirical framework. Hence, answering the research questions RQ1

Figure 1. Conceptual Framework and Hypotheses



and RQ2 are critical for practitioners and academia. A typical challenge practitioners face is how to establish a mechanism for developing new intelligent products with unique value propositions to enhance NIPP.

(2) Hypotheses : The study formulates four hypotheses as indicated in Figure 1 that are related to the research questions : RQ1 and RQ2.

(i) The Relationship Between MAP with VPI and NPPI : Marketing activities' proficiency (MAP) consists of activities that are related to capturing the unexpressed needs of customers. The intelligent product manufacturing firms put considerable efforts to collect the voice of customers. MAP enables the intelligent product manufacturing industries to study new customers, new markets, and understand the market trends and customer insights. MAP ensures the product manufacturing firms to collect the needs of new markets and customers as stated by Slater and Narver (2000). MAP enables the VPI process with the inputs needed to conceptualize and develop products with unique value propositions (Kohli & Jaworski, 1990). A research conducted by Buurman (1997) stated that VPI is oriented towards the conceptualization and development of products that are user centered, which can solve the customers' problems and enhance the advantages to customers. The inputs received from the MAP form the inputs to drive product innovation and value propositions. MAP integrated with VPI enable organizations to conceptualize, design, and develop products with features to meet the futuristic needs of the target market and customers (Gummerus, 2013 ; Hsieh, Tsai, & Wang, 2008). This results in developing products with unique value-added features that ensure superior NIPP. Hence, it is represented in Figure 1 and posited here that

- **H1:** The stronger the MAP of the firm, the greater the VPI.
- **H2:** The stronger the MAP of the firm, the greater the NIPP.
- **H2a:** The effect of MAP on NIPP is mediated through VPI.

(ii) The Relationship Between VPI and NPPI : A strong VPI results in better new intelligent products with unique value propositions that can address the current and future requirements of customers. The VPI drives technologically innovative product positioning — the new intelligent product — better when compared to competition. VPI integrates the product not only with unique product features, but also with unique delivery methods and value added after sales. This may convert the one-time intelligent products to recurring sales with subscriptions sales or a value-added service sale along with the product. Hence, it is posited here that

- **H3:** The stronger the VPI of the firm, the greater the NIPP.

Methodology

(1) Sample and Data Collection : The study gathered the final sample population which consisted of 54 responses

Table 1. Sample Characteristics

Size and Type of Business Units	*N* = 32
Large scale (>$1B revenue, >1000 employees)	18
Medium scale ($100M> revenue >$10M, 1000 > employees >100	09
Small scale (revenue < $10M, employees < 100	05

Table 2. Type of Industries

Type of Industries	#Responses *N* = 54	# Products *N* = 42	# Business Units *N* = 32
Embedded Controller Manufacturers	24	19	14
Electronics Sensors Manufacturers	18	11	08
Human Machine Interface (Displays)	08	08	06
Electronic Devices	04	04	04

gathered from the practitioners having managed development and monetization of new intelligent products. The study was conducted during the year 2018–2019. The respondents were sales managers, new product development project leaders, and industrial intelligent product manufacturing business heads. Responses were related to 42 new intelligent products belonging to 32 firms and SBUs of large global corporations. The research utilized the professional bodies' websites, exhibitions that were held related to intelligent products, and professional networks like LinkedIn as channels to identify and list the potential respondents. The survey requests were communicated through emails, telephonic conversations, and LinkedIn messaging. The study utilized tools including web meetings with audio and video conferencing while interviewing the global respondents.

The details of the size and type of business units that the respondents belonged to are listed in Table 1. The type of products referred by the respondents while answering the questionnaire are listed in Table 2, which include embedded controller manufacturing industries, sensors manufacturing industries, human machine interfaces, and display manufacturing industries. The respondents belonged to India, Germany, USA, Netherlands, and Czech Republic. The data gathered were checked for significant differences in the mean responses. The results indicated that there was no respondent bias, type of industry bias, and non - response bias.

(2) Measure Development : The purpose of the study is to establish the structural relationship between the latent variables – MAP, VPI, and NIPP selected from a detailed literature review. The study also focuses on empirically validating a framework which can be utilized to establish the structural relationships. Hence, the study adopted the scales developed by Harmancioglu et al. (2009) and Clauss (2017) to measure the marketing activities' proficiency (MAP) and value proposition innovation (VPI). Predetermined and well-planned pretest was conducted at two stages with academic and intelligent product practitioners prior to utilizing the questionnaire.

↳ ***Measures :*** The questionnaire had 23 items relevant to capture the marketing activities' proficiency, value proposition innovation, and NIPP. MAP was measured using a scale having 8 items – the scale had a set of questions which were directed towards capturing the unsaid needs of the customers. Items on the scale were well defined, which were planned to measure using scales ranging from 1–6, a 6 - point Likert scale, where 6 = *very substantial extent* and 1 = *not at all*. VPI was measured utilizing a scale having a set of well-defined questions to capture the viewpoints on new customer relationships, new offerings, new markets, and new channels (Clauss, 2017). NIPP was measured using the scale with three variables adopted from the study of Guo et al. (2018). VPI and NIPP were measured using 5 - point Likert scales. The scale ranged from 1–5, where 5 = *much better* and 1 = *much worse*.

Data Analysis and Results

The study utilizes the data collected from various practitioners having managed intelligent product development and monetization. The data gathered is investigated by utilizing structural equation modelling - partial least square (SEM-PLS). SmartPLS 3.0 is utilized to perform the SEM-PLS to analyze the data to meet the core purpose of the study. In the measurement model, an assessment of reliability and validity of the constructs is carried out as per the criteria suggested by Hair, Sarstedt, Hopkins, and Kuppelwieser (2014).

(1) Model Evaluation : All the indicators for first order construct – MAP, VPI, and NIPP are listed in Table 3. The values of loadings of variables vary between maximum of 0.936 and minimum value of 0.605, which demonstrates indicator reliability. Hence, loadings on the measurement model are > 0.6 and is acceptable as per the criteria stated by Hair et al. (2014). It is also noticed that the constructs – MAP, VPI, and NIPP have a significant

Table 3. Indicator Loadings on the Outer Measurement Model

Variable	Items on Scale to Capture Latent Variable - Value Proposition Innovation *(VPI)*	Indicator Loadings
VPI1	We regularly address new, unmet customer needs.	0.758
VPI2	Our products or services are very innovative in relation to our competitors.	0.621
VPI3	Our products or services regularly solve customer needs, which were not solved by competitors.	0.605
VPI4	We regularly take opportunities that arise in new or growing markets.	0.645
VPI5	We regularly address new, unserved market segments.	0.646
VPI6	We are constantly seeking new customer segments, markets for our products & services.	0.725
VPI7	We regularly utilize new distribution channels for our products and services.	0.761
VPI8	Constant changes of our channels have led to improved efficiency of our channel functions.	0.740
VPI9	We consistently change our portfolio of distribution channels.	0.721
VPI10	We try to increase customer retention by new service offerings.	0.819
VPI11	We emphasize innovative/modern actions to increase customer retention (e.g. CRM).	0.749
VPI12	We recently took many actions in order to strengthen customer relationships.	0.708
Variable	**Items on Scale to Capture Latent Variable - Marketing Activities' Proficiency *(MAP)***	**Indicator Loadings**
MAP1	Initial screening of the product idea - the first review of the venture.	0.67
MAP2	Preliminary assessment of the market - a cursory look at the market.	0.741
MAP3	Market study or market research - a detailed study of market potential, customer preferences, purchase process, etc.	0.785
MAP4	Prototype or sample testing - with the customer.	0.730
MAP5	Launching the product in the market - selling, promoting, and distributing.	0.662
Variable	**Items on Scale to Capture Latent Variable - New Intelligent Product Performance *(NIPP)***	**Indicator Loadings**
NIPP1	Relative to our business goals, last year our return on investment was :	0.936
NIPP2	Relative to our business goals, last year our sales growth was :	0.908
NIPP3	Relative to our business goals, last year our profit growth was :	0.874

Note. Items on scale are adopted from Clauss (2017), Harmancioglu et al. (2009), and Guo et al. (2018).

Table 4. Reliability and Convergent Validity of the Constructs

Outer Model	Cronbach's Alpha	rho_*A* (ρ_A)	Composite Reliability (CR)	AVE	Sqrt. AVE
Marketing Activities' Proficiency *(MAP)*	0.726	0.713	0.810	0.610	0.781
Value Proposition Innovation *(VPI)*	0.805	0.832	0.905	0.546	0.738
New Intelligent Product Performance *(NIPP)*	0.915	0.923	0.916	0.540	0.734

Table 5. Correlations of the First Order Latent Constructs at Outer Model

	NIPP	*MAP*	*VPI*
NIPP	1.000		
MAP	0.601	1.000	
VPI	0.614	0.540	1.000

Table 6. Discriminant Validity of Constructs : HTMT and FLC

	NIPP	*MAP*	*VPI*
NIPP	0 (0.805)	0.000	0.000
MAP	0.781 (0.621)	0(0.839)	0.000
VPI	0.825 (0.634)	0.71 (0.595)	0 (0.8313)

Table 7. Standardized Structural Coefficients and *t* - values Associated with the Direct Estimates

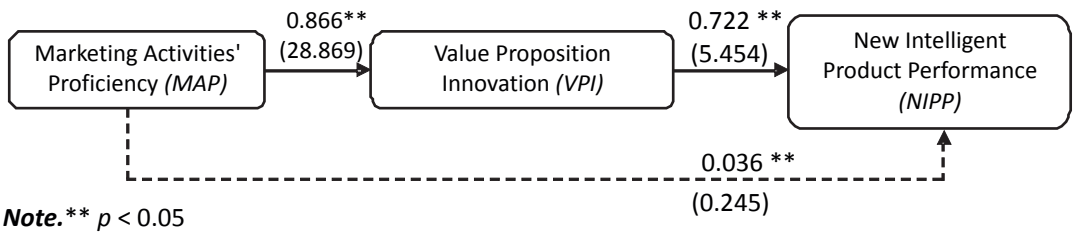
	Path to:	*MAP*	*VPI*	*NIPP*
Path from				
Marketing Activities' Proficiency (*MAP*)		-	**0.866 (28.869)**	0.036 (0.245)
Value Proposition Innovation (*VPI*)		-	-	**0.722 (5.454)**
R^2		-	0.749	0.697
Model Fit			rms Theta 0.192, SRMR 0.098	

Note. Significant ($p < 0.05$) coefficients ; (t - values above 1.96) are in bold.

and adequate loading above the prescribed minimum value of 0.5. The loading is acceptable as per a study published by Barclay, Higgins, and Thompson (1995). Table 4 indicates the composite reliabilities of the latent constructs – MAP, VPI, and NIPP which are > 0.8, which is the least threshold acceptable as per Hair et al. (2014). The average variance extracted (AVE) as per the analysis conducted is observed to be more than the acceptable value 0.5 as indicated in Table 4. The Table 4 depicts the Cronbach's α for the construct – MAP. VPI and NIPP, which have values > 0.7 demonstrate the reliability of the construct's adequate convergent validity. The correlations observed in Table 5 indicate that each of the constructs are greater than the highest correlation it parts with others. These correlation values depicted in Table 5 demonstrate the discriminant validity (Barclay et al., 1995 ; Hulland, 1999). The values of Fornell - Larcker criterion (FLC) and Heteroit - Monotrait (HTMT) for all constructs (Table 6) meet the criteria of FLC > 0.5 and HTMT< 0.9, which demonstrate adequate discriminant validity. The direct effect path coefficients for MAP – VPI – NIPP are listed in Table 7.

(2) Empirically Derived Framework for NIPP : Empirical framework shown in Figure 2 contains MAP and VPI. Both MAP and VPI significantly influence NIPP.

Figure 2. Empirical Framework Indicating Structural Relations



Note. $p < 0.05$

Discussion

The results of empirical analysis are indicated in Table 7 and Figure 2. The empirical analysis results present a positive and significant relationship between marketing activities' proficiency (MAP) and value proposition innovation (VPI) [0.866, (28.869), $p < 0.05$]. Hence, hypothesis H1 is accepted. The results suggest that MAP has a weak and direct positive relationship with NIPP [0.036, (0.245), $p < 0.05$]. It is inferred that MAP has no direct effect on NIPP. Thus, hypothesis H2 is rejected. The results indicate a positive significant relationship between VPI – NIPP [0.722, (5.454), $p < 0.05$]. The relationship path in the model with variables MAP–VPI–NIPP with a demonstrated value of $Q^2 > 0$ meets the mediation criteria stated by Baron and Kenny (1986). The results show the case of complete mediation by VPI between MAP and NIPP. The study shows that VPI positively influences the NIPP and effect of MAP on NIPP is mediated by VPI (Baron & Kenny, 1986). Hence, hypotheses H2a and H3 are accepted.

The findings of the research support the results obtained by Harmancioglu et al. (2009), who stated that marketing activities' proficiency affects new product advantage to meet unique needs of customers. It also supports the research by Ledwith and O'Dwyer (2008), who stated that marketing activities lead to product advantage. This empirical study presents a novel finding that marketing activities' proficiency leads to development of unique value propositions, which lead to superior new product performance in the context of "intelligent products." The results of this study are in contrast to the findings of Eisend, Evanschitzky, and Calantone (2016), who explained that the marketing activities' proficiency directly affects new product performance. The results present a unique finding that value proposition innovation mediates the effect of marketing activities' proficiency into new product performance. The study contributes a novel framework of marketing activities' proficiency, value proposition innovation, and new product performance in the context of new intelligent products.

Managerial Implications

The findings of the study are represented in Figure 2. These findings lead to several critical managerial implications. These findings are relevant to practitioners from industrial intelligent product manufacturers. First, the effect of MAP on NIPP is manifested through VPI ; hence, MAP, if deployed in intelligent product manufacturing firms, will lead to products with unique value propositions. Second, MAP and VPI positively and significantly effect the NIPP. This section presents challenges to implement the MAP and establish the mechanism to evolve unique value propositions. The study suggests an action plan to industrial intelligent product manufacturers to deploy these, imbibing them as part of business strategy, organizational culture, NPD processes, and policy of management.

↳ **Integrated MAP, VPI Mechanism to Attain Superior NIPP, and Action Plan to Deploy :** The empirical study

reveals that MAP influences NIPP and its effect is manifested through VPI. This implies that the process of unique value proposition is fostered by a proactive type of marketing (Kohli & Jaworski, 1990 ; Slater & Narver, 2000). The unique value propositions of new intelligent products typically should address the pains of customers as pain relievers. Typical pains that an intelligent product relieves in an industrial environment may include reduction of downtime, waste, and operation costs. The other scenario is where the user centered design of value propositions creating additional gains to customers typically includes productivity, efficiency, profitability improvements, ease of maintenance, and servicing (Buurman, 1997). The industrial customers using intelligent products may explicitly convey the pains and gains, which are typically captured in a journalistic type of voice of customer gathering. The other category of customer needs is not explicitly stated by the customers. It takes special efforts from intelligent product manufacturers to gather this type of unexpressed voice of customers. The suggested methods for intelligent product manufacturing industries are to enact like a customer, where the marketing and project team develop solutions by living the life of a customer experiencing it. The other method of voice of customer gathering that can enable new intelligent product manufacturers to gather latent needs is data scientist approach. The data gathered, if sliced and diced in different manners, can lead to identification of several latent needs. Hence, the study suggests the new intelligent product manufacturers to spend the required time and resources to record the unsaid needs of customers.

The new intelligent product manufacturing firms should plan necessary budget and human resources to deploy the proactive methods of marketing (Schmitt, 1999). The firms should also plan these expenses yearly as their part of business strategy during the planning phase. During the preparation of strategic planning, firstly, the firms should identify the new segments where they have a right to play. Second, the new intelligent product manufacturing firms should identify the set of new customers from these segments chosen to make an entry. Third, a team equipped with the right skills, equipment, tools, and templates should be allowed to gather, structure, and disseminate the voice of the customer in the organization (Richards & Jones, 2008). In this way, the intelligent product manufacturers can deploy the MAP which complements the VPI process. This ensures the deployment of MAP as part of business strategy and organization culture.

The process of VPI starts with mapping of pains, gains, and listing of what are the pain relievers and gain creators for a particular segment of customers (Camlek, 2010). The intelligent product manufacturers should organize the brainstorming sessions among the team involved in the MAP activities and drive the product solution concepts augmented with value propositions which surprises the customers, correlated to the pains and gains gathered during MAP (Camlek, 2010 ; Dubey, Bajpai & Guha, 2016). The value propositions that can be a pain reliever or a gain creator can very often be augmented with the product. But the study suggests the new intelligent product developers to explore the possibilities of value propositions beyond products. The study encourages the integration of the value proposition into after sales service, product delivery, maintenance contracts, and data analysis services. The VPI process can extend its influence to lock in customers with unique value-added services for which the customer will visit back the intelligent product manufacturer (Hudadoff, 2009). The unique value propositions thus can be augmented with products, intelligent software which can be sold as subscriptions, extended services, maintenance contracts, and solution delivery methods. The integrated approach of MAP and VPI leads to opportunities of co-development, which drives the market-based success of new products (Kowalkowski et al., 2012). This way, an integrated mechanism with MAP and VPI processes will enhance the NIPP.

Limitations of the Study and the Way Forward

The study empirically establishes the structural relationships among MAP, VPI, and NIPP. It propounds an integrated approach to deploy MAP and VPI activities. The integrated approach suggests the intelligent product

manufacturers to lock in the customers with unique value propositions creating recurring sales. This study has quite a few limitations with several factors that should be attended to in future research. First, the research utilizes the data from intelligent product manufacturing firms from several types of businesses and induced a possible degree of heterogeneity. But the samples are more inclined towards the large - scale organizations. Hence, to ensure generalizability, it is suggested to gather data from arange of industry types. Second, cross sectional longitudinal study may help in validating the study further and see how unique value propositions evolved may perform over a period of time. Finally, the study can be extended to find the relationship between MAP and VPI on other product types from different market segments.

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