

German Management of Innovation and its Impact on New Product Development and New Markets

Chanongkorn Kuntonbutr¹,
Rajamangala University of Technology Thanyaburi, Thailand
¹chanongkorn@rmutt.ac.th

Manfred Kulken²,
and Antonio Nisch³
Westfälische Hochschule,
Gelsenkirchen Bocholt Recklinghausen,
University of Applied Sciences, Germany
²manfred.kuelkens@w-hs.de
³antonio.nisch@w-hs.de

Abstract - The role of innovation has been important for the sustainability of firms for more than two decades. This study concentrates on management vision on innovation that will affect firms' new product development and new markets. The topic is Germany firms operating in various industries. The conceptual framework includes two mediators: human resource development and organization innovation process. The Structural Equation Model was applied to explain the empirical findings. The results indicate that management vision has a significant effect on both new product development and new markets through human development and organization innovation process.

Keywords - Human Resources, New Product Development, New Market, Vision, Innovation

I. INTRODUCTION

Currently in rapidly changes in markets, knowledge is crucial to the innovation opportunities for many firms in creating competitive advantage over other businesses [1-2]. A competitive advantage can help the development of business operations in terms of both market growth and new product

development. The operations of business firms is important to a country's economic development and its economic growth. Moreover, given the dynamic and uncertain business environment today, firms encounter risks from various sources such as cost reduction and global competitors. The competition among global firms has an impact on management's innovation culture and entrepreneurship. Successful firms have to create new products and services to increase their market share. In this particular case, it is necessary for firms to develop appropriate strategies to support sustainable growth in a competitive environment. Many manufacturing firms put their effort into applying a strategy of entrepreneurship and innovation to differentiate their products or services for the purpose of maintaining leadership. Not only Multinational Enterprises (MNEs), but also Small and Medium Enterprises (SMEs), are firms that invest in new innovation projects to create competitive advantage [3]. Those SMEs have to develop innovation in response to the needs of their MNEs counterparts. However, the innovation process is relatively expensive and does not guarantee success.

In considering innovation, German firms have a well-founded solid reputation for their creativity and leadership in the wider

economic context. We are interested in studying innovation in German business firms. We investigate the best practices and develop a model for other firms in developing countries to consider. The main research question of this study was concerned with the link between multi-factors of human resources, innovation, products and market development. Thus, the study focuses on SMEs' innovation because it is important to the current business scenario in term of fostering new products and new markets. In determining the success of innovation projects, one critical factor to note is human resources management to support the entire project. Yet studies on innovation linked with human resources management are few. Many studies have concentrated on human resources development policy and new product development or new market development [1-9]. However, those studies were conducted separately. This study aims to fill the gap in these two different areas - human resources development and innovation. We examine how the two different areas have an impact on new product development and marketing.

We investigated German SMEs concerning the relationship between their human resources management and innovation and this affects new product development and new markets. First, we consider the German management concentrating on their concept of innovation linked to human resources development policy to support new products and new markets. The result will ensure the vision of a management linked to the development of SMEs' new products and new markets. Second, we try to discover the indirect influence of a firm's management vision and human resources development on a new product and new market. Additionally, it is necessary for firms to have human resources support staff with the capability to participate in new product development. Finally, we clarify the organizational innovation process that mediates between management vision and human resources development policy with reference to new products and new markets. To complete these objectives, the study investigates the nature of new products and

new markets that firms require over a given period of time. The results will be beneficial in explaining a series of empirical findings which include new products and new markets.

II. THEORY AND HYPOTHESES

A. *Management Vision for Innovation*

Currently, scholars in leadership studies are interested in strategic leadership and who is responsible for overall organizational performance [13]. To study strategic leadership, one has to determine the appropriate vision, long-term goals and plan of a specific firm [13-14]. Leaders are executives or managers who are responsible for the operations and strategic thinking that focuses their endeavours on fostering innovation. Moreover, the flexibility of management teams is important to the success of new product development projects and the intensity of innovative resources to support the value of such flexibility [15]. Strategic leadership generates a firm's innovation concepts [16]. Effective management teams may devise a new policy concerning innovation development to increase new product development. It is necessary for firms to have innovative leaders to encourage inventions to become commercial applications [17]. With this the management's vision can create successful firm innovation. Consequently, firms need to prepare employees' capabilities to implement the innovation program for new product development. Furthermore, businesses need effective human resources management for the success of their innovation function [4, 18]. Managements that focus on innovation will create an innovative culture and process. However, very few studies have indicated the link between human resources management and innovation.

B. *Human Resources Development Policy*

The development of innovation within a firm needs employees able to respond to new ideas and create new products that are needed by the market. For this reason strategic human resources management in innovative firms is crucial. The strategic human resources management is positively related to innovation

capability of firms, and affects their innovation performance [18-19]. Moreover, firms' innovation is not completed with a single function and in fact is derived from multiple functions, and requires cooperation in cross-functional teams. Working teams from diversified functions or departments have to create new ideas and pass along the innovation process to all parts of the firm. The human resources function is important for firms initiating cross-functional teams in the innovation process. Research has illustrated that the process of strategic human resources management is crucial for a firm's innovation culture [20]. It is also evident that human resources practices in term of innovation must be in tune with sustainable development [4]. Human resources can be determined in multiple variables such as recruitment, fringe benefits or compensation, training, etc. Some studies indicated that compensation and training offer a key contribution to the success of organizational innovation [19]. The reward system is an important tool for motivating innovative working teams to put their effort in creating new products or services [21-22]. Also, a realistic budget is necessary for developing personnel's skills [19]. The literature has noted the crucial role played by human resources development policy and practice to an organization's innovation process when products are being developed.

In considering the management of an organization, the management policy is the starting point before transferring each function and operating activities to the appropriate department. However, the business situation is dynamic due to the changing nature of external and internal scenarios. To create sustainable development, management should be aware of the dynamic organizational capabilities [23]. The appropriate organizational process enhances creative behaviours in the development team [23]. Organizational process wields a positive effect on cross-functional competition in a particular firm [24]. This is congruent with other evidence which found organizational structure has a positive effect on firms' cross-functional competition [25]. Moreover, firms

need effective cross-functionality to enable their new products and new markets to be realised [25]. The cross-functional integration of teams has a partial mediating affect on new product development performance and this occurs to due to the organizational structure [26]. Thus, firms have to focus more on structural changes to achieve effective implementation of new product development strategies [27]. We posited that an organizational innovation process involving management concentrating on employee performance plays a critical role in the creation of new products and new markets.

These factors play an important role for SMEs in creating innovative goods and/or services. In order to derive sustainable growth appropriate to the industry, firms should extend their product life cycle by creating a new innovation [28-29]. However, competition among firms is different between local firms and between multinational firms, so businesses must optimize their limited resources for the innovation process to create new products efficiently. The reason is that multinational enterprises have much more leeway to devise an innovation than domestic business [30]. Research has noted the importance of leaders rather than employees in the innovation process for new products. For example, leader-member exchange behaviour encourages followers' creative engagement [31]. Managers who provide opportunities to their teams have an impact on innovation initiated or uncovered by team members. Moreover, employees' performance along with the right information become a catalyst for departmental creativity. In addition, organizational support for innovation is derived from an organizational innovation process including an efficient workplace structure, and have staff who are responsible for innovation, and can present their ideas to other members.

C. New Product Development

A key managerial focus and crucial source for firms to create a competitive advantage over competitors is effective interfunctional cooperation to develop new products. Studies

on firms' innovation capability and new product development are consistent on this point [27, 32]. New types of leadership and adaptive organizational culture are also important for the innovation process [33]. They have to create effective forms of interaction in multi-disciplinary groups who have different functions [34]. It should cover all formal and informal modes of communication and interaction of all persons involved in the relevant activities. In addition, an inter-personal network involving the management team will improve the effectiveness of the network between inter-firm networks when creating new products [35]. Also, researchers are interested in studying customers' involvement in the process of new product development [36]. Such a process can help update information and the development of new products to match customers' needs.

Certainly, new product development is one that creates more costs. However, investment in an innovation process can make a significant contribution to new product development [37]. In this context, management vision is important to SMEs allocating a budget to new product development, even during the period when the cost of the new product is a major consideration for SMEs. The three major areas to achieve less cost, better quality, and shorter time to market are cross-functional teams, project-fit and manufacturing resources and skills [38]. It is necessary for firms to understand the specific competency of the management team and the 'chain of command' must handle the current situation appropriately, and develop an efficient interfunctional coordination of internal functions. Managers may revise their innovation strategy to get more knowledge-sharing happening with external sources to enhance new product development [10]. They should collaborate with other organizations for the purpose of acquiring external knowledge to encourage cooperation in new product development [11]. The benefit of external information sharing is that it allows suppliers to become an integral part of the product

development team [39].

D. New Market

New markets are accessed by many firms to extend their market share and increase profits. A new market can be determined by means of market orientation that includes interfunctional coordination [40]. The development plan for firms to get market share aim to improve business reputation and customer involvement, which will benefit both current products and future products development [41]. However, SMEs are normally local operations and it is a challenge for management of SMEs to expand their marketing operations in both former markets and new markets due to the realities of economy of scale. They have to optimize their limited resources to create new products and new markets depending on the context in which they operate. Moreover, emphasis on human capabilities is crucial for using limited resources when seeking to enter a new market. Management has to implement human resources functions appropriately to achieve optimization in creating new market. Additionally, SMEs can apply collaboration with their partners and innovation outcomes in foreign business relationships to encourage a higher level of innovative collaboration [42]. Such collaboration will indicate these firms have been successful in their new market development. Management should conduct innovation programs appropriately since the market can be turbulent [43]. Updated information is required to improve business performance [44-45]. Moreover, the effect of information support firms in estimating what the market requires [46].

III. RESEARCH METHODOLOGY

This study applied the author's framework to the prior series of study conducted in Thailand. Here we were interested in German businesses in a country that is innovative. The framework includes two mediators and the Structural Equation Model is necessary for statistical purposes. The instrument used for data collection was a questionnaire derived from prior series of study with the Thai' subjects by the authors. The included

questions are concerned with management vision, human resources development policy, organizational innovation process, new markets, and new products development. The statistics serve to illustrate the empirical results garnered from the Structural Equation Model (SEM).

A. Measurement

The measurement model for the entire framework was tested for the requirements of Structural Equation Modelling. The 17 items in the survey were measured based on a 5-point Likert. A composite measurement was generated.

Reliability Testing - Cronbach’s alpha was used to investigate all items to confirm the reliability of the instrument. The final results indicate that Cronbach’s alpha was between 0.888 and 0.903, and this ensured the appropriate reliability.

Construct Validity - The construct validity and discriminant validity of the instrument were tested. The confirmatory factor analysis (CFA) was applied to measured convergence validity. The outcome of factor loading should be greater than 0.6. This study found an average variance extracted (AVE) from all the variables was above .5. Consequently, we tested the discriminant validity by examining the correlation between the construct and observed variables. It should be less than 0.85 and square root AVE should be greater than R2. The results of the AVE are presented in Table I.

B. Subject and Data Collection

The subjects of this study were German firms operating in various industries. The majority of respondents included 64 (21%) whose firms’ assets amount to 50 million baht or less, 86 (29%) with assets from 50 to 200 million baht, and 150 (50%) with assets of more than 200 million baht. Additionally, the majority of responding firms (115 – 38%) are manufacturing goods with employees numbering between 51-200 people. The percentage of firms in manufacturing of foods and medicine is 41.3% and 167 (55.7%)

have been operating for more than 15 years.

IV. FINDING

This section presents the empirical results based on the conceptual framework. First, the model was evaluated for its goodness of fit. Second, we tested the multi-collinearity between the independent variables to ensure that the model would meet the requirement of the Structural Equation Model that is based on the regression analysis. The tolerance and variance inflation factors (VIF) are measurements used for testing. The tolerance should be more than 0.1 and the VIF should be less than 10 (VIF = 1 / tolerance). Finally, the results indicated that all tested variables have tolerance and the VIF falls between the ranges, meaning that no multi-collinearity was found.

**TABLE I
FACTOR LOADING, CRITICAL RATIO, R²,
COMPOSITE RELIABILITY, AVERAGE
VARIANCE EXTRACTED (AVE)**

Variable	Factor Loading	R ²	Composite Reliability	Average Variance Extracted
MA1	0.49	0.48	0.768	0.529
MA2	0.55	0.74		
MA3	0.97	0.38		
PO1	0.92	0.84	0.889	0.672
PO2	0.92	0.85		
PO3	0.71	0.51		
PO4	0.70	0.49		
OP1	0.99	0.99	0.902	0.760
OP2	0.95	0.91		
OP3	0.63	0.40		
NM1	0.86	0.75	0.918	0.790
NM2	0.97	0.95		
NM3	0.83	0.69		
NPD1	0.80	0.64	0.870	0.628
NPD2	0.87	0.76		
NPD3	0.84	0.70		
NPD4	0.64	0.42		

The results of the measurement model indicate that the Normed Chi-Squared fit index examined from the Chi-Square/degrees of freedom is 2.955, proved to fit well to the model. The value of Goodness of Fit, and the Adjusted Goodness of Fit is .939, and .845, respectively. The Root Mean Square Error of Approximation is .052. The Normed fit index

and Comparative Fit Index have values equal to .965, and .976. All of the data stated above ensures a good fit for this specific model.

**TABLE II
CORRELATION MATRIX FOR
VARIABLES IN MODELS**

Variable Name	MA	PO	OP	NM	NPD
Management Concept	1.00				
Policy	0.50	1.00			
Operation Plan	0.60	0.81	1.00		
New Market	0.52	0.57	0.52	1.00	
New Product Development	0.59	0.83	0.77	0.65	1.00

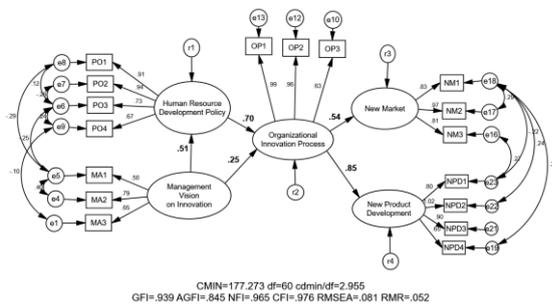


Fig. 1 Statistical Model

**TABLE III
ASSESSING THE MODEL FIT INDICATORS**

Chi-square/Degree of freedom (CMIN/df)	2.95
Goodness of Fit Index (GFI)	.939
Adjusted Goodness of Fit Index (AGFI)	.845
The Root Means Square Error of Approximation (RMSEA)	.052
NFI	.965
Comparative Fit Index (CFI)	.976

The results illustrate the following: management vision for innovation has a significant effect on HRD policy ($\beta=.70$ with p -value $<.001$); management vision for innovation and HRD policy has a significant effect on organizational innovation process ($\beta=.51$ with p -value $<.001$ and $\beta=.25$ with p -value $<.001$); and organizational innovation process has a significant effect on new markets and new product development ($\beta=.54$ with p -value $<.001$ and $\beta=.85$ with p -value $<.001$).

**TABLE IV
STANDARDIZED DIRECT
AND INDIRECT EFFECT**

	Direct Effect			Indirect Effect			Total Effect		
	MA	PO	OP	MA	PO	OP	MA	OP	OP
PO	0.51						0.51		
OP	0.25	0.70		0.35			0.60	0.70	
NE			0.54	0.50	0.37		0.50	0.37	0.54
NPD			0.85	0.32	0.59		0.32	0.59	0.85

The indirect effect of management vision on new markets with reference to innovation is $\beta=.50$; the indirect effect of HRD policy is 0.37. NPD is affected by management vision for innovation at $\beta=.32$ and from HRD policy it is 0.59. These findings support the assertion that management vision for innovation and a HRD policy do wield an impact on new markets and NPD through an OP.

V. CONCLUSIONS AND DISCUSSION

This study investigated management vision on innovation and its influence on new markets and new product development in SMEs. Our framework presents two mediators, these being human resources development policy and organizational innovation process. The empirical results found that management vision on innovation has a significant effect on human resources development policy. Both these independent variables impact on new markets and new product development through organizational innovation process through the agency of management. Human resources development policy functions where firms focus on product development activities, and concentrate on human resources where personnel have the skills to make the processes come to fruition. Such firms have policies in place for allowing their employees develop new knowledge such as sending their employees to seminars or acquiring knowledge from external sources. In terms of organizational innovation process, this factor indicates firms encourage their employees to work specifically on new innovations and product development. The new product development strategy can be determined when businesses create a goal to market and sell different or new products. They are in the

process of developing new products and launch new ones every three years. Furthermore firms that having new markets collect the data from the market on how well their new products are selling. They have a plan for continuous preparation for new markets. Based on the findings for German SMEs, we suggest that SMEs should revise their policies concerning the development of new innovations so that they are in tandem with human resources development. Doing so will benefit their new product development and new market strategies and improve the organization's innovation process. Finally, we suggest that future analyses should examine the effects of information technology on innovation culture, new product development, new markets and how all these factors lead to business growth.

VI. ACKNOWLEDGEMENT

We would like to devote our endeavour to the continuous collaboration between our two institutions, Westfälische Hochschule Gelsenkirchen Bocholt Recklinghausen University of Applied Sciences and Rajamangala University of Technology Thanyaburi. The collaboration has been conducted for more than 10 years with regard to research coordination and student exchange.

REFERENCES

(Arranged in the order of citation in the same fashion as the case of Footnotes.)

- [1] Dong, J.Q. and Yang, C.-H. (2016). "Being central is a double-edged sword: Knowledge network centrality and new product development in US pharmaceutical industry". *Technological Forecasting and Social Change*, Vol. 113, pp. 379-385.
- [2] Wang, H., Choi, J., Wan, G., and Dong, J.Q. (2016). "Slack resources and the rent-generating potential of firm-specific knowledge". *Journal of Management*, Vol. 42, pp. 500-523.
- [3] Aziz, N.N.A. and Samad, S. (2016). "Innovation and Competitive Advantage: Moderating Effects of Firm Age in Foods Manufacturing SMEs in Malaysia". *Procedia Economics and Finance*, Vol. 35, pp. 256-266.
- [4] Bircan, İ. and Gençler, F. (2015). "Analysis of Innovation-Based Human Resources for Sustainable Development". *Procedia - Social and Behavioral Sciences*, Vol. 195, pp. 1348-1354.
- [5] Kazakovs, M. (2014). "Analysis of Factors Influencing the Choice of Solutions for Human Resource Development". *Procedia - Social and Behavioral Sciences*, Vol. 156, pp. 111-115.
- [6] Kazakovs, M., Verdina, A., and Arhipova, I. (2015). "Automation of Human Resources Development Planning". *Procedia Computer Science*, Vol. 77, pp. 234-239.
- [7] Andrioni, F. and Popp, L.E. (2012). "Plea For The Development of Human Resources Through Professional Training in Romania". *Procedia - Social and Behavioral Sciences*, Vol. 62, pp. 413-417.
- [8] Reis, G.G., Borini, F.M., and Fleury, M.T.L. (2014). "Drivers of human resource management competences development in Brazilian multinational subsidiaries: a multilevel research". *Revista de Administração*, Vol. 49, pp. 519-533.
- [9] Mazzola, E., Bruccoleri, M., and Perrone, G. (2015). "Supply chain of innovation and new product development". *Journal of Purchasing and Supply Management*, Vol. 21, pp. 273-284.
- [10] Oh, J., Lee, S., and Yang, J. (2015). "A collaboration model for new product development through the integration of PLM and SCM in the electronics industry". *Computers in Industry*, Vol. 73, pp. 82-92.
- [11] Bstieler, L. and Hemmert, M. (2015). "The effectiveness of relational and contractual governance in new product development collaborations: Evidence from Korea". *Technovation*, Vol. 45-46, pp. 29-39.

- [12] Sjoerdsma, M. and van Weele, A.J. (2015). "Managing supplier relationships in a new product development context". *Journal of Purchasing and Supply Management*, Vol. 21, pp. 192-203.
- [13] Özer, F. and Tinaztepe, C. (2014). "Effect of Strategic Leadership Styles on Firm Performance: A Study in a Turkish SME". *Procedia - Social and Behavioral Sciences*, Vol. 150, pp. 778-784.
- [14] Dimitrios, N.K., Sakas, D.P., and Vlachos, D.S. (2013). "Analysis of Strategic Leadership Models in Information Technology". *Procedia - Social and Behavioral Sciences*, Vol. 73, pp. 268-275.
- [15] Kettunen, J., Grushka-Cockayne, Y., Degraeve, Z., and De Reyck, B. (2015). "New product development flexibility in a competitive environment". *European Journal of Operational Research*, Vol. 244, pp. 892-904.
- [16] Bouhali, R., Mekdad, Y., Lebsir, H., and Ferkha, L. (2015). "Leader Roles for Innovation: Strategic Thinking and Planning". *Procedia - Social and Behavioral Sciences*, Vol. 181, pp. 72-78.
- [17] Vlok, A. (2012). "A leadership competency profile for innovation leaders in a science-based research and innovation organization in South Africa". *Procedia - Social and Behavioral Sciences*, Vol. 41, pp. 209-226.
- [18] Aryanto, R., Fontana, A., and Afiff, A.Z. (2015). "Strategic Human Resource Management, Innovation Capability and Performance: An Empirical Study in Indonesia Software Industry". *Procedia - Social and Behavioral Sciences*, Vol. 211, pp. 874-879.
- [19] Afacan Findikli, M., Yozgat, U., and Rofcanin, Y. (2015). "Examining Organizational Innovation and Knowledge Management Capacity the Central Role of Strategic Human Resources Practices (SHRPs)". *Procedia - Social and Behavioral Sciences*, Vol. 181, pp. 377-387.
- [20] Uslu, T. (2015). "Innovation Culture and Strategic Human Resource Management in Public and Private Sector within the Framework of Employee Ownership". *Procedia - Social and Behavioral Sciences*, Vol. 195, pp. 1463-1470.
- [21] Kesting, P. and Parm Ulhøi, J. (2010). "Employee-driven innovation: extending the license to foster innovation". *Management Decision*, Vol. 48, pp. 65-84.
- [22] Herrmann, A., Tomczak, T., and Befurt, R. (2006). "Determinants of radical product innovations". *European Journal of Innovation Management*, Vol. 9, pp. 20-43.
- [23] Wu, K.-J., Liao, C.-J., Chen, C.-C., Lin, Y., and Tsai, C.F.M. (2016). "Exploring eco-innovation in dynamic organizational capability under incomplete information in the Taiwanese lighting industry". *International Journal of Production Economics*, Vol. 181, Part B, pp. 419-440.
- [24] Neubert, M.J., Hunter, E.M., and Tolentino, R.C. (2016). "A servant leader and their stakeholders: When does organizational structure enhance a leader's influence?". *The Leadership Quarterly*, Vol. 27, pp. 896-910.
- [25] Strese, S., Meuer, M.W., Flatten, T.C., and Brettel, M. (2016). "Organizational antecedents of cross-functional cooperation: The impact of leadership and organizational structure on cross-functional cooperation". *Industrial Marketing Management*, Vol. 53, pp. 42-55.
- [26] Bai, W., Feng, Y., Yue, Y., and Feng, L. (2017). "Organizational Structure, Cross-functional Integration and Performance of New Product Development Team". *Procedia Engineering*, Vol. 174, pp. 621-629.
- [27] Woschke, T. and Haase, H. (2016). "Enhancing new product development capabilities of small - and medium-sized enterprises through managerial innovations". *The Journal of High Technology Management Research*, Vol. 27, pp. 53-64.

- [28] Cooper, R.G. (2011). "Winning at new products: Creating value through innovation". Basic Books.
- [29] Crossan, M.M. and Apaydin, M. (2010). "A multi-dimensional framework of organizational innovation: A systematic review of the literature". *Journal of management studies*, Vol. 47, pp. 1154-1191.
- [30] Gao, W. and Chou, J. (2015). "Innovation efficiency, global diversification, and firm value". *Journal of Corporate Finance*, Vol. 30, pp. 278-298.
- [31] Huang, L., Krasikova, D.V., and Liu, D. (2016). "I can do it, so can you: The role of leader creative self-efficacy in facilitating follower creativity". *Organizational Behavior and Human Decision Processes*, Vol. 132, pp. 49-62.
- [32] Wang, C.L. and Ahmed, P.K. (2007). "Dynamic capabilities: A review and research agenda". *International journal of management reviews*, Vol. 9, pp. 31-51.
- [33] Mustafa, H.H. (2015). "The role of ICT management to achieve organizational innovation". *International Journal of Organizational Innovation (Online)*, Vol. 7, pp. 48.
- [34] Felekoglu, B., Maier, A.M., and Moultrie, J. (2013). "Interactions in new product development: How the nature of the NPD process influences interaction between teams and management". *Journal of Engineering and Technology Management*, Vol. 30, pp. 384-401.
- [35] Mazzola, E., Perrone, G., and Kamuriwo, D.S. (2016). "The interaction between inter-firm and interlocking directorate networks on firm's new product development outcomes". *Journal of Business Research*, Vol. 69, pp. 672-682.
- [36] La Rocca, A., Moscatelli, P., Perna, A., and Snehota, I. (2016). "Customer involvement in new product development in B2B: The role of sales". *Industrial Marketing Management*, Vol. 58, pp. 45-57.
- [37] Roper, S., Micheli, P., Love, J.H., and Vahter, P. (2016). "The roles and effectiveness of design in new product development: A study of Irish manufacturers". *Research Policy*, Vol. 45, pp. 319-329.
- [38] Nafisi, M., Wiktorsson, M., and Rösiö, C. (2016). "Manufacturing Involvement in New Product Development: An Explorative Case Study in Heavy Automotive Component Assembly". *Procedia CIRP*, Vol. 50, pp. 65-69.
- [39] Thomas, E. (2013). "Supplier integration in new product development: Computer mediated communication, knowledge exchange and buyer performance". *Industrial Marketing Management*, Vol. 42, pp. 890-899.
- [40] Narver, J.C. and Slater, S.F. (1990). "The effect of a market orientation on business profitability". *The Journal of marketing*, pp. 20-35.
- [41] Gupta, V., Dutta, K., and Chauhan, D.S. (2016). "Mass market development strategies of software industries: Case study based research". *Perspectives in Science*, Vol. 8, pp. 96-100.
- [42] Nordman, E.R. and Tolstoy, D. (2016). "The impact of opportunity connectedness on innovation in SMEs' foreign-market relationships". *Technovation*, Vol. 57-58, pp. 47-57.
- [43] Seo, Y.W. and Chae, S.W. (2016). "Market Dynamics and Innovation Management on Performance in SMEs: Multi-agent Simulation Approach". *Procedia Computer Science*, Vol. 91, pp. 707-714.
- [44] Song, M., Wang, T., and Parry, M.E. (2010). "Do market information processes improve new venture performance?". *Journal of Business Venturing*, Vol. 25, pp. 556-568.
- [45] Durmuşoğlu, S.S. and Barczak, G. (2011). "The use of information technology tools in new product development phases: Analysis of effects on new product innovativeness, quality, and market performance". *Industrial Marketing Management*, Vol. 40, pp. 321-330.

- [46] Qiu, L., Rui, H., and Whinston, A. (2013). “Social network-embedded prediction markets: The effects of information acquisition and communication on predictions”. *Decision Support Systems*, Vol. 55, pp. 978-987.