Market Orientation, New Product Development and New Product Performance: A Model and Test

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ABSTRACT

This paper aims at proposing, and empirically examining, a new model for studying the effect of market orientation over new product performance. While most available research has addressed such effect directly, without reaching conclusive results, the paper introduces a model suggesting that market orientation affects new product performance indirectly- through its effect over the New Product Development (NPD) process. To assess the proposed model and its associated hypotheses, structural path analysis was conducted on data collected from a sample of 335 manufacturing organizations registered in Jordan Industrial Estates Corporation (JIEC). Empirical results underlined that the three components of market orientation (i.e. customer orientation, competitor orientation, inter-functional coordination) had a direct significant effect over NPD process. On the other hand, NPD process had a direct effect over new product customer performance, while it had an indirect effect over new product financial performance. Based on the paper's empirical findings, several conclusions were drawn. Furthermore, several managerial implications were suggested, while the limitations of this paper and future research avenues were also addressed.

Keywords: Market Orientation, Customer Orientation, Competitor Orientation, Inter-functional Coordination, New Product Development Process, New Product Customer Performance, New Product Financial Performance.

INTRODUCTION

New products are essential to the long-term survival and growth of any organization (Ramaseshan et al., 2002; Owens, 2007; Abdul Adis and Razli, 2009). However, new product development is one of the most difficult activities in business (Clark and Wheelwright, 1995), which is usually associated with high failure rates (Gotteland and Boule, 2006; Ledwith and O'Dwyer, 2009). Hence, increasing understanding of what drives new product performance is critical (Ledwith and O'Dwyer, 2009). During the last two decades, empirical research has introduced several concepts as antecedents of new product performance and success (e.g. Atuahene-Gima, 1995; Cooper and Kleinschmidt, 1995; Cooper, 1999; Song and Parry, 1997; Poolton and Barclay, 1998; Lynn et al.,1999; Ramaseshan et al., 2002; Im et al., 2003; Wei and Morgan, 2004; Gotteland and Boule, 2006; Ho and Tsai, 2006; Frishammar and Horte, 2007; Grinstein, 2008). Amongst those antecedents is the concept of market orientation.

However, while ample research has underlined the influence of market orientation over organizational performance in various contexts (e.g. Dwairi et al., 2007; Farrell et al., 2008; Gonzalez-Benito et al., 2009; Subramanian et al., 2009; Silva et al., 2009; Qu, 2009; Voola and O'Cass; 2010), research concerning the market orientation-new product performance relationship is less common (Gotteland and Boule, 2006). Furthermore,

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available research has produced inconclusive results with regard to market orientation- new product performance relationship (Gotteland and Boule, 2006; Wei and Atuahene-Gima, 2009). In addition, most of this research has proposed and examined a direct relationship between market orientation and new product performance, without addressing the interrelationships that might occur between market orientation and other functions and processes related to new product performance (Henard and Szymanski, 2001; Im et al., 2003; Gotteland and Boule; 2006).

Han and Kim (1998) and Gotteland and Boule (2006) argue that without clear understanding of the way a market-orientation culture is transformed into a superior performance of new products, one cannot fully understand the market orientation – new product performance relationship. Hence, the purpose of this paper is to examine the effect of market orientation over new product performance through the effect exerted by the former over new product development process. While adding to the limited body of literature on Market orientation-new product performance relationship, the paper's contribution stems from the fact that it introduces a new model for studying such relationship.

The paper is organized into eight sections. Section two reviews available literature on new product performance, while section three introduces the paper's model and hypotheses. Section four underlines the research methodology and statistical analysis of the model. Section five discusses the empirical results of statistical analysis, while section six presents the paper's conclusions. Section seven suggests some managerial implications. Finally, section eight underlines the paper's contribution, limitations and suggests some future research avenues.

Literature Review:

New Product Performance: The Search For Success.

Despite its vital importance to all organizations, new product performance has always been a cause of concern due to the high levels of new product failure rates (Gotteland and Boule, 2006; Ledwith and O'Dwyer, 2009). During the last decade, a considerable stream of research was devoted to explore and underline the factors that might contribute to New Product Development (NPD) and New Product (NP) performance. Table (1) shows some of the factors proposed by previous literature to affect NP performance.

Table. 1: Literature Review on Factors Proposed to Affect New Product Performance

Author(s)	Proposed Factors	Major Findings
Atuahene-Gima (1995)	Market orientation.	Results show a strong positive relationship between market orientation and new product's market performance. Market orientation appears to have a stronger influence over new product performance when the product represents incremental change to both customer and firm.

Author(s)	Proposed Factors	Major Findings
Song and Parry (1997)	Level of cross-functional integration, information sharing, marketing and technical resources and skills, proficiency of new product development activities, the nature of market conditions.	Cross-functional integration and competitive advantage are two key determinants of new product success.
Lynn et al (1999)	Vision, NPD process, long term view, product refinement.	Both vision and NPD process had a significant impact on new product performance. On the other hand, both long-term view and product refinement failed to exert any impact over it.
Saban et al (2000)	Organizational learning.	Organizational learning impacts new product performance and should be considered as a critical component to the NPD process.
Alam (2003)	Idea generation and screening, formation of cross-functional teams, proficiency in commercialization activities.	Idea generation and screening efforts, forming a cross-functional team and proficiency in commercialisation activities are essential to the success of a banking product.
Wei & Morgan (2004)	Market orientation, supportiveness of organizational climate.	While a direct effect of market orientation over new product performance was established, supportiveness of organizational climate had no direct significant effect over new product performance.
Ciappei & Simoni (2005)	Extended team approach, customer orientation, use of advanced information and communication technology for new product development.	Three macro factors have a positive influence on new product success: extended team approach (also cross-company); customer orientation; and the use of advanced ICTs for new product development.
Gotteland & Boule (2006)	Market orientation.	The relationship between market orientation and new product performance is moderated by environmental conditions and mediated by instrumental use of information.
Frishammar and Horte (2007)	Market orientation, entrepreneurial orientation.	Market orientation and innovativeness were positively related to performance, while proactiveness and risk taking showed no such relationship.

Author(s)	Proposed Factors	Major Findings
Ledwith and O'Dwyer (2009)	Market orientation.	Amongst the three components of market orientation, only competitor orientation was significantly linked to new product performance.
Liu & Tsai (2009)	Product design, NPD process management.	The integration between new product design valued by companies in Taiwan and development process management would lead to significantly positive influence over new product performance.
O'Dwyer & Ledwith (2009)	Competitor orientation, product launch proficiency.	Competitor orientation and product proficiency are strongly linked to new product performance and organizational performance in small firms.
Wei and Atuahene-Gima (2009)	Market orientation.	The reward system applied by Chinese firms moderates the effect of market orientation over new product performance.
Dayan & Basarir (2010)	Team reflexivity.	Team reflexivity is significantly related to new product success if the environmental conditions are turbulent.

While not claiming to be exhaustive in nature, Table (1) shows some of the factors proposed, by previous research, to affect NP performance. Careful review of the table underlines four major observations. Firstly, NP performance is a multi-dependent concept, i.e. could be affected by a number of factors simultaneously. However, Table (1) underlines earlier, and current comments that there is no common set of factors that affect NP performance (i.e. Montoya- Weiss and Calantone,1994; Sun and Wing, 2005; Suwannaporn and Speece, 2010). This could be due to differences in researchers' backgrounds, perspectives and research contexts (Suwannaporn and Speece, 2010). The factors are thus many and various, but they can be parsimoniously classified as strategic, organizational, NPD process, and market environmental (Montoya-Weiss and Calantone, 1994), all but "market environmental" are under direct managerial control (Im et al., 2003).

Secondly, there seems to be a general agreement on market orientation as a major antecedent of new product performance. According to Abdul Adis and Razli (2009), the concept of strategic orientation is originally conceptualized from market orientation. Hence, and in relation to Montoya- Weiss and Calantone's (1994) classification, market orientation represents a strategic business requirement to reduce the risk of new product failure (Day, 1994; Lukas and Ferrell, 2000; Frishammar and Horte, 2007). Thirdly, while the NPD process is occasionally addressed by previous research, its effect over NP performance should not be overlooked. However, the NPD process itself is affected by other strategic and organizational factors. Hence, addressing the NPD process as an independent -rather than interdependent- factor overlooks the interrelationships that take place within the organization, and affect its NP performance.

Fourthly, in relation to earlier observations (i.e. Im et al., 2004), the studies reviewed in Table (1) have largely

focused on identifying factors that directly influence NP performance. Henard and Szymanski's (2001) suggest that a more constructive approach is to examine the interrelationships among NP performance predictors. Such approach should capture the inherent complexities of new product development and success (Henard and Szymanski, 2001). According to Henard and Szymanski (2001) and Im et al. (2003), few research has been made to model how firms generate ideas for new products and how successful idea generation and success at each NPD process activities eventually translate into new product success. This paper attempts to contribute to such research through introducing a model linking market orientation, NPD process and new product performance.

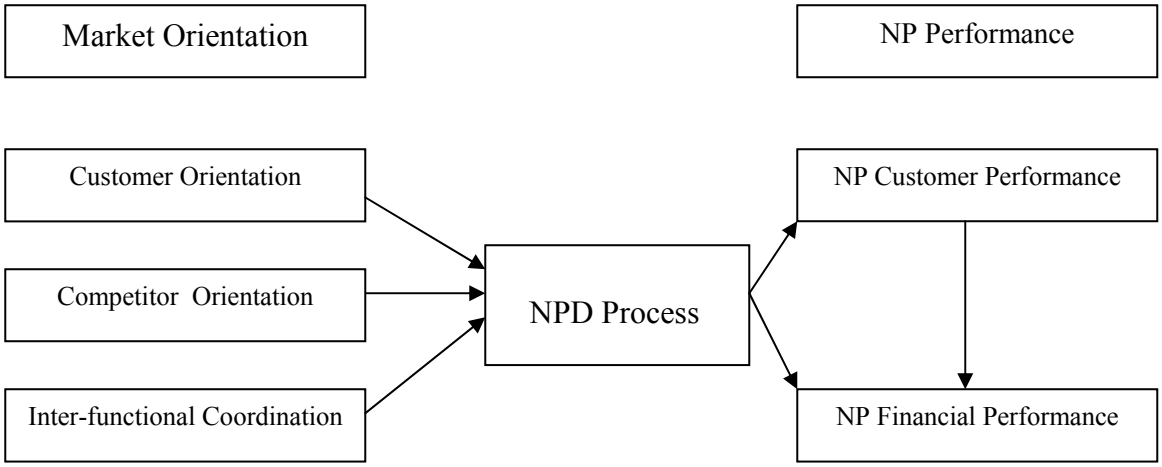

Figure 1. Proposed Model.

Proposed Model:

Figure 1. shows the paper's proposed model. The model suggests that market orientation affects organizations' NPD process, which in turn affects NP's performance.

Model Constructs:

Market Orientation:

Although research on market orientation has a long history, Kholi and Jaworski (1990) and Narver and Slater (1990) revived the interest in this line of research (Frishammar and Horte, 2007). Adopting a behavioral approach to the concept, Kholi and Jaworski (1990) defined market orientateon as "the organization- wide information generation, and dissemination and appropriate response related to current and future customer needs and preferences" (p. 6). On the other hand, and adopting a cultural approach, Narver and Slater (1990) defined market orientation as "the organization culture that most effectively and efficiently creates the necessary behaviors for the creation of superior value for buyers and, thus, continuous superior performance for the business" (p. 21). According to Narver and Slater (1990; 1994), market orientation manifests through three major behavioral components; (1) customer orientation, (2) competitor orientation and (3) inter-functional coordination. Customer orientation and competitor orientation represent a relative emphasis on collecting and processing information pertaining to customer preferences and competitor capabilities,

respectively. Inter-functional coordination encompasses the coordinated application of organizational resources to synthesize and disseminate market intelligence (Narver and Slater, 1990; Slater and Narver, 1994). With the cultural approach most dominant, both approaches of market orientation were applied in examining its direct effect over NP performance, Table (2).

Table 2. Literature Review on Market Orientation Direct Effect over New Product Performance

Authors	Conceptual Approach for Market Orientation	Support for Market Orientation Direct Influence Over New Product Performance
Appiah-Adu and Ranchhod (1998)	Approach not specified	Not supported
Wren et al (2000)	Behavioral approach	Supported
Kahn (2001)	Cultural approach	Not supported
Subramanian & Gopalakrishna (2001)	Cultural approach	Supported
Ramaseshan et al (2002)	Approach not specified	supported
Langerak et al (2004)	Cultural approach	Not supported
Wei and Morgan (2004)	Behavioral approach	Supported
Grinstein (2008)	Cultural approach	Supported
Ledwith and O'Dwyer (2009)	Cultural approach	Supported
Wei and Atuahene-Gima (2009)	Approach not specified	Supported

Review of research in Table (2) underlines that a direct influence of market orientation over new product performance is not conclusive. Furthermore, careful examination of some research underlines that while some components of market orientation exert significant direct effect over NP performance, other components fail to exert the same effect. For instance, while Bozic (2006) found a positive direct effect of customer orientation and competitor orientation over new product innovativeness, inter-functional coordination had a negative effect over the same variable. Furthermore, Ledwith and O'Dwyer (2009) found that market orientation had a direct significant effect over NP performance. However, careful exploration of such relationship showed that, amongst all three components of market orientation (i.e. customer orientation, competitor orientation, inter-functional coordination), only competitor orientation had a direct significant effect over NP performance (Ledwith and O'Dwyer, 2009).

Such inconsistency in previous empirical results underlines three suggestions. Firstly, a direct market orientation- new product performance relationship is context dependent. Hence, constant examination of such relationship is required in different countries and industries (Sun and Wing, 2005). Secondly, a holistic view of market orientation could give misleading results.

Hence, careful examination and analysis of the impact the three components of market orientation have on NP performance is a more solid approach. Thirdly, while market orientation failed to exert a significant direct effect over NP performance in some research, such effect might have been indirect through market orientation influence over other antecedents of NP performance. In fact, limited empirical research has underlined an indirect effect of some market orientation components over NP performance. For instance, Im et al. (2003) found that customer orientation and cross-functional integration, had a direct effect over the initiation and implementation phases of NPD process, which in turn had a direct significant effect over NP performance. Furthermore, Gotteland and Boule (2006) underlined a direct effect of customer orientation and competitor orientation over instrumental use of market information, which in turn had a direct effect over NP performance. Accordingly, the proposition that market orientation can affect NP performance indirectly through its influence over other factors seems logical.

New Product Development Process:

According to Meybodi (2003), new product development process is an inter-linked sequence of information processing tasks/steps where knowledge of customer needs is translated into a final product design. Generally speaking, more successful firms in new product commercialization have a formal development process that is maintained for a long time (Booz et al., 1982; Varela and Benito, 2005). A formal new product development process consists of several steps/tasks, which, depending on authors considered, range from three to thirteen (Tidd et al., 2001). Earlier work by Cooper and Kleinschmidt (1986) has underlined that, in order for a new product to succeed, each step must be carried out with a minimal level of success. The steps may be sequential, simultaneous and/or iterative (Im et al., 2003). Furthermore, the implementation of those steps could be on a functional level, inter-functional level or through especially assigned NPD teams (Varela and Benito, 2005). The functional level approach has a rigid functional structure, on the other hand, the inter-functional approach allows for a higher degree of communication and coordination between different functions. While both functional and inter-functional approaches are rigid to a certain extent, the NPD teams approach is more flexible.

Empirical research has underlined that the NPD process is affected by other organizational factors. Table (3) underlines some factors proposed by previous literature to affect NPD process.

Table 3: Literature Review on Factors Proposed to Affect NPD Process.

Author(s)	Proposed Factors
March-Corda et al (2002)	Top management support, product development planning process, analysis of market requirements/demands.
Im et al. (2003)	Customer orientation, cross-functional integration, NPD team efficiency.
Varela and Benito (2005)	Management emphasis on innovation, decision making centralization, experience in NPD.
Ho and Tsai (2006)	Dynamic capabilities, market orientation, organizational resources.

Author(s)	Proposed Factors
Owens (2007)	Senior management support, early integration of functional expertise in NPD, availability of NPD resources, organizational environment support to team work.
Aydin et al. (2007)	Marketing performance.
Chailom and Ussahawanitchakit (2008)	Competitor orientation, market professionalism.
Lee (2008)	Team reflexivity, product innovativeness.
Abdul Adis & Razli (2009)	Strategic orientation, marketing strategy, market research activities.
Wang et al. (2009)	Resource allocation strategy.
Suwannaporn & Speece (2010)	Marketing research, internal communication, supplier linkages, strategy and planning.

As in the case with NP performance, Table (3) underlines that there is no conclusive list of factors that affect NPD process. Hence, the proposition of those factors could depend on researchers' perceptions and research context. Noticeably, though, scarce empirical research has attempted to explore the direct effect of market orientation, as an organizational culture, over NPD process. Furthermore, while some components of market orientation were addressed by some authors (i.e. Im et al., 2003; Chailom and Ussahawanitchakit, 2008; Abdul Adis & Razli, 2009), they were addressed as individual concepts rather than as components of market orientation. Hence, a study of the direct influence of all market orientation components over NPD process is worthwhile, since it could underline the direct effect of market-oriented organizational behaviors over NPD process.

Finally, empirical research has underlined a direct effect of NPD process over new product performance (e.g. Cooper and Kleinschmidt, 1995; Cooper, 1997; Im et al., 2003). Accordingly, it can be argued that NPD process is an interdependent process, and that its effect over NP performance should be addressed in relation to other organizational factors.

New Product Performance:

NP performance has been measured in different ways (Gotteland and Boule, 2006). Ledwith and O'Dwyer (2009) grouped NP performance measures under five categories: (1) market-level measures, (2) financial measures, (3) customer measures, (4) product level measures and (5) timing measures. Such variation in PN performance measures underlines its vital, and multi-faceted, contribution to organizations' overall performance. Nevertheless, amongst the five categories, customer and financial measures were termed "core success/ failure measures" (Griffen and Page, 1993; Im et al., 2003). Hence, both of those measures were addressed in this paper's model.

Hypotheses Development:

Earlier remarks (i.e. Han & Kim, 1998; in Gotteland and Boule, 2006) suggest that without clear understanding of the way a market-orientation culture is transformed into a superior performance of new products, one cannot fully understand the market orientation – new product performance relationship. Building on previous discussion, and in relation to its proposed model, the paper argues that market orientation, with its three behavioral components affects NP performance indirectly, through its effect over the NPD process.

Market Orientation and NPD Process:

The NPD process is based upon market information and knowledge (Cooper, 1997; Atuahene-Gima, 1995; Meybodi 2003; Wei and Morgna, 2004; Frishammar and Horte, 2007; Abdul Adiz and Razli, 2009). Hence, the NPD process requires customer and competitor information to be distributed through all concerned functions, and to be used in all of NPD process steps (Atuahene-Gima, 1995; Wei and Morgna, 2004; Frishammar and Horte, 2007). While adopting a market oriented culture should facilitate the generation and dissemination of customer and competitor information across organizations' multiple functions and tasks, this paper hypothesizes that:

H1: Market orientation has a positive direct effect over NPD process.

Adopting a cultural approach, this paper suggests that market orientation influence over NPD process takes place through the influence of market orientation's three components over that process.

Customer Orientation:

Customer orientation is a firm's understanding of its own customers, which enables it to provide superior value (Narver and Slater, 1990). Customer oriented organizations emphasize information use and learning, and uncover latent customer needs, thus enhancing innovativeness through new product development (Atuahene-Gima, 1995; Narver et al; 2004). While the debate as to the direct effect of customer orientation on new product performance is still unresolved (Grinstein, 2008), limited empirical findings of previous research suggest that customer orientation has a positive direct effect over the NPD process (Im et al., 2003; Chailom and Ussahawanitchakit, 2008). The underlying argument behind such effect is that NPD process success depends on customer acceptance of the new product. Therefore, if customers needs, wants and preferences are considered through all the NPD process steps, the process itself will succeed in producing successful new products. Accordingly:

H1a. Customer orientation has a positive direct effect over NPD process.

Competitor Orientation:

Competitor orientation refers to the ability of a firm to identify, analyze and respond to competitor actions (Narver and Slater, 1990). Competitor- oriented organizations continuously monitor progress against rivals, and gain opportunities by creating products or marketing programs that are differentiated from those of competitors (Im and Workman, 2004). While the effect of competitor orientation over new product performance is inconclusive (Grinstein, 2008), scarce empirical research has underlined a positive direct effect of competitor orientation over NPD process (i.e. Chailom and Ussahawanitchakit, 2008). Such effect was based on the assumption that when competitor information and intelligence are incorporated in the NPD process, such process will result in new products better than those of competitors. Accordingly, a relative emphasis on competitor orientation can influence NPD process (Frambach et al., 2003):

H2b. Competitor orientation has a positive direct effect over NPD process.

Inter-functional Coordination:

Inter-functional coordination encompasses the coordinated application of organizational resources to synthesize and disseminate market intelligence (Narver and Slater, 1990; Slater and Narver, 1994). While

several terminologies were used to describe it, the significance of inter-functional coordination to the NPD process is well documented (Im et al., 2003). According to pervious research (Calantone and Di Benedetto, 1990; Olson et al; 1995; Im et al., 2003), to carry out the NPD process, which is innately complex and multi-faceted endeavor, R&D, marketing and manufacturing departments must pull their assets, expertise and activities together. Hence, while inter-functional coordination enhances cooperation, communication and information dissemination between the departments - or teams-associated with the NPD process, it is hypothesized that:

H3c. Inter-functional coordination has a positive direct effect over NPD process.

NPD Process and NP Performance:

New Product (NP) performance is the extent to which new products are perceived to meet their market share, sales and customer use, sales growth and profit objectives (Frishammar and Horte, 2007: 765). Empirical evidence has underlined a significant direct effect of NPD process over new product and organizational performance (Cooper and Kleinschmidt, 1995; Cooper, 1997; Im et al., 2003; Aydin et al., 2007; Chailom and Ussahawanitchakit, 2008; Liu and Tsai, 2009). The basic assumption of such effect is that a successful NPD process will lead to a successful new product. The major indicator of a new product success is customer acceptance and adoption of new product, hence:

H2. NPD process has a significant positive effect over NP customer performance.

Furthermore, the success of the new product on customer and market level should increase the organization's sales, market share and profits. Consequently, the new product will achieve financial success. Previous empirical findings support such proposition (e.g. Im et al., 2003),hence:

H3. NPD process has a direct significant effect over NP financial performance.

However, since that the NPD process is a costly endeavor, new product financial performance might not be achieved through the early stages of new product life cycle. But customer acceptance and continuous adoption, through purchase repetition, should make the new product financially viable in later stages of its life. Hence:

H4. NP customer performance has a positive direct effect over its financial performance.

Research Methodology

Research Population and Sample

The research population consisted of all 474 manufacturing organizations registered in Jordan Industrial Estates Corporation (JIEC) during 2008. The rationale behind choosing those organizations as research population was twofold. First, JIEC is the oldest (established in 1980) and the biggest industrial complex in Jordan with a total investment of 1,431 billion Jordanian Dinars (JIEC, 2008). Second, manufacturing organizations operating in JIEC represent the majority of manufacturing organizations and industries in Jordan with exporting operations of 772,92 million Jordanian Dinars, in addition to their operations in Jordan (JIEC, 2008). Hence, while representing the core of the manufacturing industry in Jordan, those organizations were deemed a suitable context to undertake empirical studies concerning vital business issues, such as new

product development and performance. Contact details of all organizations' were obtained from JIEC. The researcher established contacts and cooperated with JIEC through which hard copies of the research questionnaire were distributed and delivered to all manufacturing organizations operating in JIEC.

Careful examination of organizations' structures revealed that the majority of manufacturing organizations have organized their NPD activities under either the "inter-functional" or the "NPD teams" approaches (see section 2.1.2.). "Marketing" and "marketing and sales" managers were responsible of NPD in organizations applying the "inter-functional" approach, while NPD responsibility was assigned to NPD managers in organizations applying the "NPD teams" approach. Consequently, the research sample included marketing, marketing and sales, or NPD managers who were directly involved in developing new products. This was consistent with previous empirical research conducted in this area (e.g. Varela and Benito, 2005; Lee, 2008; Abdul Adis and Razli, 2009). Thus, the unit of analysis was "the organization" represented by marketing or NPD managers.

Questionnaire and Data Collection

The primary data collection process was carried out using a highly structured questionnaire. The questionnaire was developed based on relevant literature review of market orientation, NPD process and NP performance. A small section was also included in the questionnaire to study respondents' characteristics. The research instrument was piloted using personal interviews with key marketing and NPD managers to assess their ability to understand it, and to test its appropriateness for research purposes. The questionnaire was delivered to all 474 manufacturing organizations operating in JIEC, and research objectives were explained to contacted managers. The respondents were reminded three times; via personal contacts, telephone calls and email, respectively.

Out of the 474 delivered questionnaires, 410 were returned, resulting in a response rate of 86.5%. The valid and useable questionnaires were 355 (86.6%) of returned questionnaires. In order to assess potential non-response bias, t-tests were conducted to examine differences between early and late respondents (Armstrong and Overton, 1977). Results of t-tests analysis showed no significant differences between the two groups of respondents, indicating that non-response bias was not present.

Measurement Items.

Items measuring market orientation, NPD process and NP performance were adopted from previous research. The research items were measured on 5-point Likert-type scales ranging from 5 (strongly agree) to 1 (strongly disagree). Appendix A shows constructs' measurement items and their sources.

Market Orientation Items: Adopting a cultural approach, market orientation was proposed to consist of three behavioral components, i.e. customer orientation, competitor orientation and inter-functional coordination. Five items were used to measure customer orientation, while four items were used to measure competitor orientation. Both customer orientation and competitor orientation items were adopted from the MKTOR scale developed by Narver and Slater (1990). MKTOR scale has proved its applicability for measuring market orientation components in very different and heterogeneous markets (Hooley et al., 2000; Bozic, 2006).

On the other hand, six items were adopted from the literature to measure the "inter-functional coordination" construct (i.e. Oldenboom & Abratt, 2000; Hong et al., 2004; De Luka & Atuahene-Gima, 2007). While the

MKTOR scale includes several items that measure inter-functional coordination, the decision to adopt other items to measure the concept was due to the fact that some organizations develop their new products through NPD teams, which required specifically designed items to address such a fact.

NPD Process Items: A formal new product development process consists of several steps/tasks, which, depending on authors considered, range from three to thirteen (Tidd et al., 2001). Accordingly, nine items were adopted to measure the NPD process, and to accommodate the most referred to steps in reviewed literature (i.e. Alam and Perry, 2002; Alam, 2003; Stevens and Dimitriadis, 2005).

NP Performance Items: Customer and financial measures were used to assess NP performance. Four items measured NP customer performance, while other four items measured NP financial performance. Both customer and financial measures were adopted from, and consistent with, previous research (i.e. Storey and Kelly, 2001; Alam, 2003; Im et al., 2003; Gotteland and Boule, 2006; Frishammar and Horte, 2007).

Sample Characteristics

A filtering question was used to reveal if each organization in the sample has developed new products over the past three years. If a respondent answered this question positively he/she was asked to proceed in answering the questionnaire. Accordingly, 86.6% of the manufacturing organizations developed new products over the last three years, meanwhile 13.4% did not. The great majority of those organizations had more than 50 employees. Furthermore, the majority of those organizations were well experienced in their industry. On the other hand, 84.2% of the organizations' managers have obtained a bachelor degree or above, while the majority of those managers were also well experienced in developing new products. Appendix B exhibits the research sample characteristics.

Constructs Validity and Composite Reliability

The validity of the research instrument was assessed through different types of validity. **Face validity** was assessed through the pilot work of research instrument with managers in manufacturing organizations, as well as two academics from reputable business schools in Jordan, who checked the relevance and appropriateness of the questionnaire to achieve the research objectives providing evidence of face validity. With regard to **content validity**, it lies in the procedures that are used to develop the research questionnaire (Churchill, 2001). These procedures were: (a) conducting a thorough examination of the previous empirical and theoretical work on market orientation, NPD process and NP performance, and (b) conducting the pilot study before starting the fieldwork.

With regard to **construct validity**, and as recommended by Hair et al., (1998), Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are used to assess construct validity. Thus, EFA was performed to test the degree to which the items were tapping the same constructs they were supposed to measure. It has been recommended that CFA, derived from Structural Equation Modelling (SEM), is a more rigorous test of unidimensionality (Garver and Mentzer, 1999: 40). Thus, CFA was also utilized to confirm or refine the unidimensionality of measurements that resulted from the EFA.

To assess the EFA, four commonly used assumptions were followed (Hair et al., 1998; Field, 2000): (1) sampling adequacy (Kaiser-Meyer-Olkin measure greater than 0.5); (2) the minimum Eigenvalue for each

factor to be one; (3) considering the sample size, factor loading of 0.40 for each item was considered as the threshold for retaining items to ensure greater confidence; and (4) varimax rotation was used since it is a good general approach that simplifies the interpretations of factors (Field, 2000: 449). Statistical Package for Social Sciences (SPSS) shows which variables 'clump together'. To assess the CFA, goodness of measurement model fit using SEM were followed (Chau, 1997: 318): Chi-square ($P \geq 0.05$); Goodness-of-Fit Index ($GFI \geq 0.90$); Adjusted Goodness-of-Fit Index ($AGFI \geq 0.80$); Normed Fit Index ($NFI \geq 0.90$); Non-Normed Fit Index ($NNFI \geq 0.90$); Comparative Fit Index ($CFI \geq 0.90$); Standardised Root Mean-Square Residual ($SRMR \leq 0.08$); and Root Mean Square Error of Approximation ($RMSEA < 0.10$). Factor loadings are the correlations of the variables with the factor, the weighted combination of variables which best explains the variance. Higher values (more than 0.50) making the variable representative of the factor (Hair et al., 1998: 106; Kline, 1998).

As shown in Table (4), all questionnaire items were conducted to EFA. The items loaded on a six-factor model. An index of Kaiser's measure of sampling adequacy (overall MSA = 0.90) and Bartlett's test of Sphericity Chi-square ($p \leq 0.000$) suggested that factor analysis was appropriate for analyzing the data. Furthermore, Eigen-values were greater than 1 indicating that data could be grouped into six factors which explained 54% of the variance. Finally, all of the items had factor loadings exceeding the cut-off point value; 0.40. The results of EFA indicated that the items measuring market orientation loaded on only three factors, which provided empirical support to its literature, especially the multidimensionality of market orientation (Narver and Slater, 1990). Furthermore, EFA results indicated that the NPD process was a unidimensional construct, while NP performance items resulted in two dimensions; NP customer and financial performance. Such results provided empirical support for the NPD process and NP performance literature (e.g. Storey and Kelly, 2001; Alam and Perry, 2002; Alam, 2003; Im et al., 2003; Gottelan and Boule, 2005; Stevens and Dimitriadis, 2005; Frishammar and Horte, 2007).

To confirm and validate the findings that emerged from using EFA, the components of the emerging six factors were evaluated by CFA using EQS 6.1 software. The measurement model of the CFA relates the observed variables to their latent variable. As shown in table (5), measures of goodness-of-fit were met. It should be noted from table (5) that there were non significant loadings; this is due to the measurement model identification. The parameters without (*) in all table contents were specified as starting values "specified as fixed". A starting value is needed for each of the parameters' constructs to be estimated because the fitting algorithm involves iterative estimation, starting from a suitable approximation to the required results and proceeding to their 'optimum' values (Dunn et al., 1994: 23-24). As shown in table (5), CFA results supported the findings that emerged from EFA, and all items loadings well exceeded the cut-off point value; 0.50.

Convergent validity was examined using the Bentler-Bonett Normed Fit Index (NFI) (Bentler and Bonett, 1990). All of the constructs had NFI values above 0.90. Furthermore, as shown in tables (4, 5 and 6), indication of the measures' convergent validity was provided by the fact that all factor loadings were significant and that the scales exhibited high levels of internal consistency (Gerbing and Anderson, 1988; Fornell and Larcker, 1981). Furthermore, as shown in these tables, the values of **composite reliability** and Average Variance Extracted (AVE) for each construct were all above the threshold suggested by Bagozzi

(1980): 0.70 and 0.50, respectively. Evidence of the measures' **discriminant validity** was provided based on the assessment of lower correlations between distinct constructs compared to the average variance extracted, as shown in tables (4, 5, and 6).

Table 4 Exploratory Factor Analysis (EFA) Results for the Research Constructs

Research Constructs: Dimensions and Measurements	**EFA Results**	
	Factor Loadings	
Customer Orientation	**Factor 1**	**Eigen Value**
We continuously try to discover additional needs of our customers of which they are unaware	**0.42**	**8.920**
We work closely with lead users who try to recognize customer needs months before the majority of the market may recognize them	**0.65**	
We measure customer satisfaction continuously	**0.69**	
Our business objectives are driven primarily by customer satisfaction	**0.61**	
Our business strategies are driven primarily by the goal of increasing customer value	**0.55**	
Competitor Orientation	**Factor 2**	**Eigen Value**
Employees throughout the organization share information concerning competitor's activities	**0.71**	**2.160**
We rapidly respond to competitive actions that threaten us	**0.72**	
Top management regularly discuss competitor's strengths and weaknesses on a continuous basis	**0.67**	
We target customers where we have an opportunity for competitive advantage	**0.59**	
Inter-Functional Coordination	**Factor 3**	**Eigen Value**
Trust exists between marketing, sales and technical people within the NPD team	**0.62**	**1.968**
Top management provides environment for inter-departmental communications and integration	**0.72**	
Top management has a long-term commitment to develop new products	**0.74**	
The NPD team members represent a variety of disciplines within the company	**0.73**	
Marketing management works well with the other functional management such as research, distribution, finance, purchasing…etc.	**0.74**	
The NPD process is well managed	**0.60**	
NPD Process	**Factor 1**	**Eigen Value**
NPD idea generation	**0.58**	**1.737**
NPD idea screening	**0.52**	
NPD business analysis	**0.43**	
Formation of cross functional teams for NPD	**0.46**	

Research Constructs: Dimensions and Measurements	**EFA Results**	
	Factor Loadings	
New product design and specifications	**0.43**	
NPD marketing strategy	**0.70**	
New product testing	**0.64**	
New product test marketing	**0.65**	
New product commercialization	**0.52**	
NP Customer Performance	**Factor 1**	**Eigen Value**
Overall, our customers are more satisfied with our new product/s	**0.65**	
Increasing our customers' loyalty	**0.68**	**1.246**
Attracting more new customers due to our new product/s	**0.65**	
Our customers encourage other people to buy our new products	**0.70**	
NP Financial Performance	**Factor 2**	**Eigen Value**
Increasing our company's revenues from new customers	**0.73**	
Increasing our current customers account share	**0.77**	**1.145**
Increasing our company's sales volume	**0.65**	
Increasing our company's net profits	**0.62**	
Sampling adequacy (Kaiser-Meyer-Olkin measure greater than 0.5):	**0.90**	

Table 5 Confirmatory Factor Analysis (CFA) Results for the Research Constructs

Research Constructs: Dimensions and Measurements	**CFA Results**		
Customer Orientation	**Factor Loadings**	**Composite Reliability**	**Average Variance Extracted**
We continuously try to discover additional needs of our customers of which they are unaware	**0.61**	**0.87**	**0.57**
We work closely with lead users who try to recognize customer needs months before the majority of the market may recognize them	**0.65***		
We measure customer satisfaction continuously	**0.60***		
Our business objectives are driven primarily by customer satisfaction	**0.70***		
Our business strategies are driven primarily by the goal of increasing customer value	**0.73***		

Research Constructs: Dimensions and Measurements	CFA Results		
Competitor Orientation			
Employees throughout the organization share information concerning competitor's activities	**0.65**	**0.88**	**0.65**
We rapidly respond to competitive actions that threaten us	**0.72***		
Top management regularly discuss competitor's strengths and weaknesses on a continuous basis	**0.74***		
We target customers where we have an opportunity for competitive advantage	**0.61***		
Inter-Functional Coordination			
Trust exists between marketing, sales and technical people within the NPD team	**0.62**	**0.92**	**0.65**
Top management provides environment for inter-departmental communications and integration	**0.68***		
Top management has a long-term commitment to develop new products	**0.75***		
The NPD team members represent a variety of disciplines within the company	**0.72***		
Marketing management works well with the other functional management such as research, distribution, finance, purchasing…etc.	**0.71***		
The NPD process is well managed	**0.61***		
NPD Process			
NPD idea generation	**0.59**	**0.90**	**0.53**
NPD idea screening	**0.60***		
NPD business analysis	**0.62***		
Formation of cross functional teams for NPD	**0.61***		
New product design and specifications	**0.61***		
NPD marketing strategy	**0.58***		
New product testing	**0.67***		
New product test marketing	**0.62***		
New product commercialization	**0.61***		
NPD Performance			
NP Customer Performance			
Overall, our customers are more satisfied with our new product/s	**0.70**	**0.89**	**0.70**
Increasing our customers' loyalty	**0.74***		

Research Constructs: Dimensions and Measurements	**CFA Results**		
Attracting more new customers due to our new product/s	**0.70***		
Our customers encourage other people to buy our new products	**0.64***		
NP Financial Performance			
Increasing our company's revenues from new customers	**0.61**	**0.87**	**0.63**
Increasing our current customers account share	**0.65***		
Increasing our company's sales volume	**0.62***		
Increasing our company's net profits	**0.69***		

Model goodness of fit indices: Desired Level	χ^2 **P ≥ 0.05**	**GFI ≥ 0.90**	**AGFI ≥ 0.80**	**NFI ≥ 0.90**	**CFI ≥ 0.90**	**NNFI≥ 0.90**	**SRMR ≤ 0.08**	**RMSEA < 0.10**
Model indices results	**813 P=0.000**	**0.926**	**0.938**	**0.911**	**0.944**	**0.937**	**0.046**	**0.047**

Table 6 Correlations among the Research Constructs

The Research Constructs	**Customer Orientation**	**Competitor Orientation**	**Inter-Functional Coordination**	**NPD Process**	**NP Customer Performance**	**NP Financial Performance**
Customer Orientation (M = 3.95, std = 0.56)	**1.00**	**0.591***	**0.415***	**0.532***	**0.468***	**0.327***
Competitor Orientation (M = 4.01, std = 0.53)		**1.00**	**0.393***	**0.467***	**0.418***	**0.245***
Inter-Functional coordination (M = 4.00, std = 0.51)			**1.00**	**0.460***	**0.471***	**0.311***
NPD Process (M = 4.07, std = 0.44)				**1.00**	**0.506***	**0.298***
NP Customer Performance (M = 4.13, std = 0.52)					**1.00**	**0.457***
NP Financial Performance (M = 4.04, std = 0.51)						**1.00**

*Correlation is significant at the 0.01 level

Structural Model and Hypotheses Testing

The research model was empirically tested using structural path analysis. As shown in figure 2, the analysis began by creating a direct path from each market orientation components to NPD process, and direct paths were also run from NPD process to each NP customer and financial performance dimensions. Finally, a direct path was run from NP customer performance to NP financial performance.

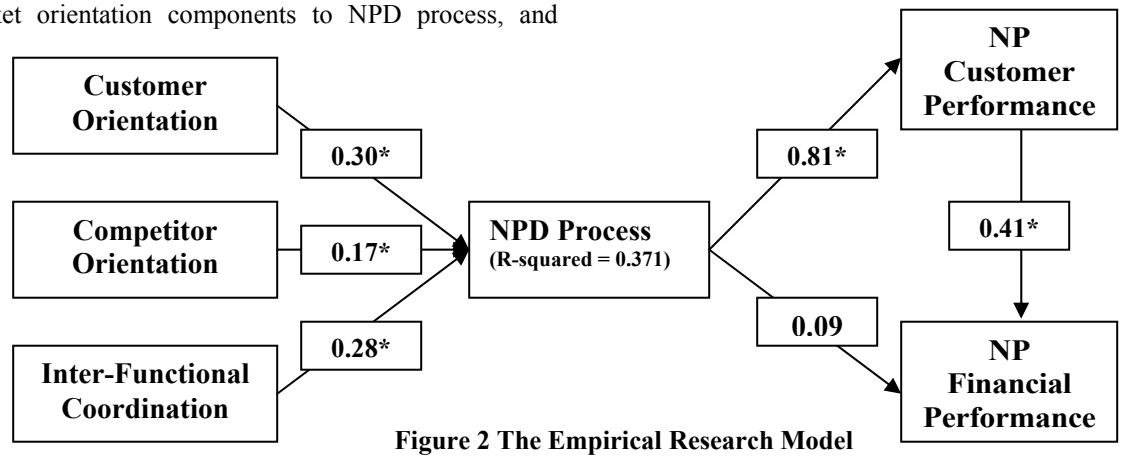

Figure 2 The Empirical Research Model

As shown in table (7), the goodness-of-fit measures indicated that the model had an excellent fit to the data. All research hypotheses were supported except hypothesis H3, which was not supported but maintained a positive effect.

Table 7 Summary of Structural Path Model Results

H1-H6	Variables in the Paths Model	Beta*	T-Value*	Hypotheses Testing Results
H1a	Customer orientation and NPD process	**0.30***	**6.50***	Supported-Direct, positive & significant effect
H1b	Competitor orientation and NPD process	**0.17***	**3.74***	Supported-Direct, positive & significant effect
H1c	Inter-functional coordination and NPD process	**0.28***	**7.08***	Supported-Direct, positive & significant effect
H2	NPD process and NP customer performance	**0.81***	**11.12***	Supported-Direct, positive & significant effect
H3	NPD process and NP financial performance	**0.09**	**1.56**	Not supported-Direct, positive & non-significant effect
H4	NP customer performance and NP financial performance	**0.41***	**7.54***	Supported-Direct, positive & significant effect

*** Standardised Beta Coefficients.** *** Significant at P < 0.05**

Model goodness of fit indices	χ^2	GFI	AGFI	NFI	CFI	NNFI	SRMR	RMSEA
	9.46, P=0.09	**0.991**	**0.963**	**0.986**	**0.993**	**0.979**	**0.027**	**0.050**

As Table (7) shows, all three components of market orientation had a positive significant effect over NPD process. The strongest effect was exerted by customer orientation (Beta = 0.30, t = 6.50) followed by Inter-functional coordination (Beta = 0.28, t = 7.08) and competitor orientation (Beta = 0.17, t = 3.74). The fact that H1a, H1b and H1c were supported gives support to H1. Hence, market orientation exerts a positive direct effect over NPD process. On the other hand, the NPD process had a strong and positive significant effect over NP customer performance (Beta = 0.81, t = 11.12), meanwhile, it had a positive but non-significant effect on NP financial performance (Beta = 0.09, t = 1.65). Hence, while H2 was supported, H3 was not supported. Furthermore, NP customer performance exerted a positive direct effect over NP financial performance (Beta = 0.41, t = 7.54). Hence, H4 was supported. Finally, the R-squared result for the NPD process suggested that the three behavioral components of market orientation explained 37.1% of variation in NPD process.

Discussion of Results:

Market Orientation Effect over NPD Process:

As a culture, market orientation is manifested through three behavioral components, i.e. customer orientation, competitor orientation and inter-functional coordination. Those components have a direct, yet varied effect over NPD process. Having been described as the "core" of market orientation (Narver and Slater, 1990; Deshpande et al., 1993), customer orientation had the strongest effect over new product development. While such result is consistent with previous empirical findings (Im et al., 2003), it emphasizes that understanding customer needs, wants and preferences is the major driver of successful NPD processes for Jordanian manufacturing organizations.

Inter-functional coordination was the second strongest driver of NPD process. In fact, its effect over NPD process was relatively close to that of customer orientation. When considering that NPD process is a multi-step activity performed by people with different specializations, and coming from different functions within the organization, such result becomes more understandable. The result further emphasizes that communication and information sharing through all NPD process steps is a vital requirement for its success (Atuahene-Gima, 1995; Perks and Riihela, 2004; Wei and Morgna, 2004; Frishammar and Horte, 2007).

Competitor orientation had the weakest effect on NPD process when compared to the effects of customer orientation and inter-functional coordination. Several authors have argued that businesses are less likely to launch radically new products if they focus too closely on competition (Hayes and Abernathy 1980; Bennett and Cooper, 1981; Zahra et al., 1995; Lukas and Ferrell, 2000). Hence, the relatively low effect of competitor orientation might be explained by responding managers' belief that a strong influence of competitor orientation over the NPD process might turn it into a product imitation, rather than development process. Nevertheless, competitor orientation remains a considerable driver of NPD process since it can give the organization certain directions with regard to the novelty and innovativeness of its products when compared to those of competitors.

Finally, while empirical results have underlined the importance of market orientation, and its components, to the NPD process. R- squared result suggests that NPD process in Jordanian manufacturing organizations might be affected by other factors. These factors could be internal to the organization (e.g. senior management support, resources availability and allocation, market professionalism, etc.), or they could be external (e.g. legislative, economic, social, technological and market

conditions, etc.).

NPD Process Effect over NP Performance:

The impact of NPD process over NP performance has been underlined by previous research, and by using different measures (e.g. Cooper and Kleinschmidt, 1995; Im et al., 2003; Aydin et al., 2007; Chailom and Ussahawanitchakit, 2008; Liu and Tsai, 2009). In the context of this paper, NPD process exerted a very strong influence over NP customer performance. Such result underlines that successful NPD processes should result in successful new products, thus, increasing customer satisfaction, loyalty and positive word of mouth. However, NPD process had a non-significant effect over NP financial performance in the Jordanian manufacturing organizations, a result contradicting with some earlier empirical findings in other contexts (i.e. Im et al., 2003). Nevertheless, such results should be viewed in relation to the fact that NP customer performance had considerable direct effect over NP financial performance. Accordingly, a possible explanation for the non-significant direct effect of NPD process over NP financial performance could be that the NPD process is a costly endeavor, hence, manufacturing organizations require some time to recover their costs and start achieving profit targets. Therefore, NP financial success might not be achieved during the early stages of NP life cycle. However, customer acceptance and continuous adoption, and purchase repetition, should make the new product financially viable in later stages of its life. Accordingly, the influence of NPD process over NP financial performance could be indirect, through the influence of NPD process over NP customer performance.

Conclusions:

A number of conclusions can be drawn from the previous discussion. Firstly, while a direct effect of market orientation over NP performance is inconclusive, Table (2), such effect could be indirect. In other words, market orientation could affect NP performance indirectly through its effect over other organizational concepts, functions and processes which have a more direct effect over NP performance, such as NPD process. Secondly, the NPD process itself is an interdependent process. While NPD process has a direct effect over NP performance, the success of NPD process itself depends on other organizational factors, including market orientation. Thirdly, the success of NP should not be addressed from a financial perspective only, especially in the early stages of NP life cycle, since that financial measures could give misleading indications. Other non-financial measures, e.g. NP customer performance should be applied since they can give a more holistic view of NP's current and future performance. Finally, other organizational factors could affect NP performance. However, the effects of such factors might not be direct in nature. In other words, NP performance depends on the relationships and interactions that take place among the different organizational factors. The fact that the interaction between market orientation and NPD process affects NP performance supports such conclusion.

Managerial Implications:

Managers responsible for the new product development in the Jordanian manufacturing organizations should focus more on customer oriented behaviors. Constant monitoring of customer needs, wants, preferences, suggestions and complaints can yield to more innovative and successful products. While customer-focused marketing research can give great insights for managers as where to go with regard to new product development. Customer service should also be

recognized, and empowered, as a major source of customers inputs about current products, which can enable managers in developing more customer-oriented future products. Furthermore, NPD managers among enable more effective coordination and communication among NPD teams, or among functions associated with NPD. While Information and Communication Technology (ICT) can provide suitable infrastructure for more communication and coordination, NPD managers should also focus on eliminating any cultural barriers that might hinder coordination within their organizations. In addition, NPD managers should be cautious to the negative effects of close competitor monitoring. In other words, NPD managers should not make competitor-oriented behaviors as their main target, since it might lead to weaker, more imitative, new products. Finally, in order to get a more holistic perspective of NP performance, managers of manufacturing organizations should apply long-term performance measures, such as customer and market measures, in addition to short-term financial measures.

Contribution, Limitations and Future Research:

The contribution of this paper is threefold. Firstly, based on previous remarks and suggestions, the paper introduces a new model for studying the relationship between market orientation, as an organizational culture, and new product performance. The model focuses on the interactions that take place between market orientation behavioral components and another important factor in NP success, i.e. NPD process.

Secondly, the paper provides evidence to support the indirect relationship between market orientation and NP performance. Thirdly, the paper provides some practical insights for managers responsible for NPD in the Jordanian manufacturing organizations.

Nevertheless, the paper's contribution should be addressed in relation to its limitations. Firstly, the paper focuses on manufacturing organization's registered to the JIEC. While they represent the majority of the Jordanian manufacturing sector, other organizations not registered in JIEC were not addressed. This limits the paper's generalizability to manufacturing organizations registered in JIEC. Secondly, the paper's focus on manufacturing organizations limits its contribution to the manufacturing sector only. New product development is not restricted to the manufacturing sector. The service sector is a ripe field for new product development, in addition to being an important contributor to the economy of most, if not all, countries. Thirdly, the paper's model focuses on organizational factors affecting NP, while other environmental factors could have a considerable influence over NP performance. Fourthly, the paper focuses on two dimensions of NP performance, i.e. NP customer and financial performance measures. Whilst being the core success/failure measures of NP performance, other dimensions of NP performance might add more insights to the effects of market orientation and NPD process over NP performance.

Accordingly, some future research avenues are suggested. Firstly, future research can apply the same model in other types of industries, such as the service industry, and also in other countries. Secondly, future research can extend the paper's model to study the mediating/moderating effects of other organizational and environmental factors over NP performance. Finally, future research can assess NP performance through other NP performance measures such as product, market and timing measures.

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التوجه نحو السوق في تطوير وأداء المنتج الجديد: نموذج واختبار

*سامر المحمد**

ملخـص

هدفت هذه الدراسة إلى اقتراح، واختبار نموذج جديد لدراسة تأثير التوجه نحو السوق في أداء المنتج الجديد. في حين أن معظم الدراسات المتوافرة قد درست التأثير المباشر للتوجه نحو السوق في أداء المنتج الجديد، من غير الوصول إلى نتائج حاسمة. تقدم هذه الدراسة نموذجا يقترح بأن التوجه نحو السوق يؤثر في أداء المنتج الجديد على نحو غير مباشر، من خلال تأثيره في عملية تطوير المنتج الجديد. استخدمت الدراسة تحليل المسار الهيكلي على عينة مكونة من 335 منظمة صناعية مدرجة في مؤسسة المناطق الصناعية الأردنية. وقد أشارت النتائج الإحصائية إلى وجود تأثير مباشر ذي دلالة إحصائية لمكونات التوجه نحو السوق (التوجه نحو العميل، التوجه نحو المنافسين، التنسيق بين الوظائف) في عملية تطوير المنتج الجديد. من جانب آخر، أشارت النتائج الإحصائية إلى وجود تأثير مباشر وذي دلالة إحصائية لعملية تطوير المنتج الجديد في أداء المنتج الجديد المرتبط بالعملاء، في حين كان تأثيرها غير مباشر على الأداء المالي للمنتج الجديد. على ضوء النتائج الإحصائية، خلصت الدراسة إلى عدد من الاستنتاجات والتوصيات. أخيرا، وبناء على محدداتها، تقترح الدراسة بضعة مجالات للأبحاث المستقبلية.

الكلمات الدالة: التوجه نحو السوق، التوجه نحو العميل، التوجه نحو المنافسين، التنسيق بين الوظائف، عملية تطوير المنتج الجديد، أداء المنتج الجديد المرتبط بالعملاء، الأداء المالي للمنتج الجديد.

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