

Transforming of External Knowledge to New Products: The Effects of Market Orientation and Absorptive Capacity

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Abstract

This study focuses on innovative firms' absorptive capacity, market orientation and their manufacturing performance of creative new products within their new product development projects. The research was conducted on 177 manufacturing firms who use industrial design in their creative new product development process participated in the "Design Turkey" industrial design platform between 2008 – 2014. In our model, it is investigated the impacts of knowledge based capabilities on creative new products through their interaction with operational capabilities. External knowledge sources transmute focal firms' internal capabilities including manufacturing process. The results show that there is a positive relationship between absorptive capacity and market orientation. Similarly, there is a positive association between market orientation and manufacturing performance. However, it releases that research firms are not in need of absorptive capacity in manufacturing process about creative products

Key words: Absorptive Capacity; Creative Industry; Industrial Design; Manufacturing Performance, Market Orientation; New Product Development

1.INTRODUCTION

Comprehensive environmental knowledge scanning and adaptation to environmental change is closely related to competitiveness (Barringer and Bluedorn, 1999; Tu et al., 2006). Organizational learning (Olivarieta and Friedman, 2008) and acquisition of new knowledge (Paiva et al., 2012) foster sustainable competitive advantage. Since knowledge has a critical role on competitive advantage, most of innovative companies can continue to exist under today's knowledge-based competitive conditions as far as they can obtain market knowledge (Murray and Chao, 2005; Chen et al., 2009; Kim et al., 2013; Blazeska and Ristovska, 2016).

Thereby, innovative companies that follow the differentiation strategy must develop new products to maintain competitive advantage (Vázquez et al., 2001; MacCurtain et al., 2010; Estrada et al., 2016; Synnes and Welo, 2016). Product innovation is an output of organizational learning and successful new product development based on creative ideas (Sanchez and Mahoney, 1996; Alegrea and Chiva, 2008; Chuang et al., 2015). Knowledge is a strategic resource for continuous learning and knowledge scanning activity about market players to sustain competitive advantage (Day, 1994; Murray and Chao, 2005; Kim et al., 2013; Cruz-González et al., 2015). Additionally, absorbed knowledge is underpinning of transforming of external knowledge in new product development process (Cohen and Levinthal, 1990; Abecassis-Moedas and Mahmoud-Jouini, 2008; Awwad and Akroush, 2016). Accordingly, absorptive capacity is a success key of innovative companies because it makes external knowledge meaningful (Im and Workman, 2004; Kim et al., 2013; Scaringella and Burtschell, 2017). Absorptive capacity provides extramural knowledge blended with existing knowledge to transform into creative new products (Chang et al., 2014). External knowledge sources to generate new product ideas in a market are mainly customers and competitors (Bhuiyan, 2011; Chen et al., 2012). Similarly, market orientation, which covers market knowledge on the needs of customers and activities of competitors, inspires new product creativity and new product ideas (I. L. Sandvik and K. Sandvik, 2003; Im and Workman, 2004; Kim et al., 2013).

As an activity based on market knowledge, creative new product development is a critical process that determines firm performance (Ozdemir et al., 2017). Two of the key phases of the new product development process are design and manufacturing (Perks et al., 2005). While design fulfills its function by approaching a new product with a creative perspective, manufacturing has to fulfill its function under different manufacturing constraints (Tarasewich, 1996; Abecassis-Moedas and Mahmoud-Jouini, 2008). These constraints are associated with efforts about faster developed and higher quality products. (Serhan et al., 2015; Blazeska and Ristovska, 2016; Synnes and Welo, 2016). Accordingly, these efforts are based on a balance amongst competitive priorities including cost, quality, speed, flexibility (Gunday et al., 2011). In the context of competitive priorities, manufacturing types and innovation practices in new product development conduce to the circulation and effective use of knowledge within the organization (Koufteros and Marcoulides, 2006; Koufteros et al., 2014).

Manufacturing capability is determinant in the performance of the product development process. Therefore, improvements can be made at the cost and speed of new product development by process management (Tuli and Shankar, 2015). In the new product development process, manufacturing and marketing capabilities are in interact with the design (Abecassis-Moedas and Mahmoud-Jouini, 2008). Related capabilities about conversion creative ideas into creative new products with superior designs offer alternative products according to the characteristics of the market (Alegrea and Chiva, 2008; Chang et al., 2014). In this connection, a firm's competitive performance depends on capability of knowledge creation and knowledge transforming (Rebolledo et al., 2009). This background supports the importance of absorptive capacity and market orientation in the new product development process in design oriented creative industry.

2. THEORETICAL BACKGROUND

In our conceptual model, the industrial design and new product manufacturing are evaluated from absorptive capacity and market orientation perspective. Therefore, different disciplines involved in product development process are taken into consideration with holistic perspective. The impacts of market orientation and absorptive capacity on manufacturing performance of creative new products are evaluated.

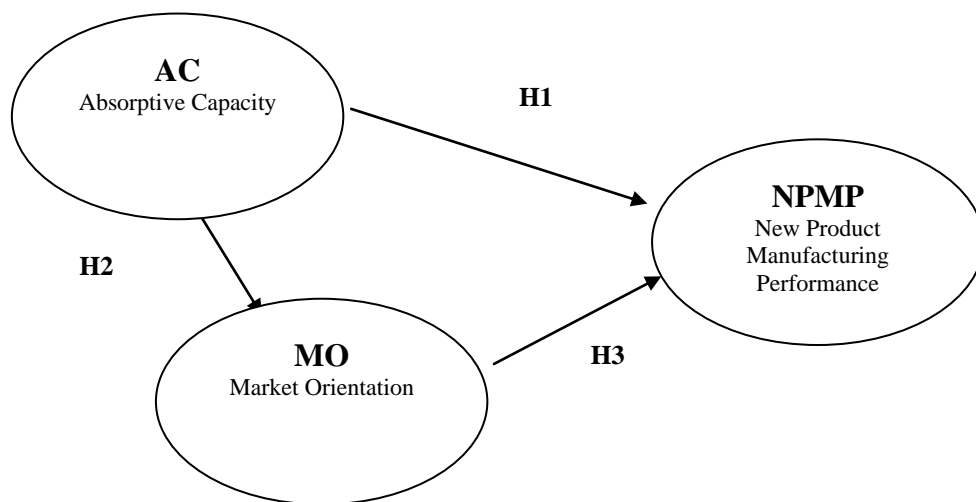


Figure1. Conceptual framework.

The paper aims to empirically test and investigate the relationship between the impact of the absorptive capacity on manufacturing performance as well as the impact of market orientation on new product manufacturing performance. In this study, absorptive capacity, market orientation and their effects on manufacturing performance of creative new products are elucidated from knowledge based perspective. It is evaluated that how absorbed knowledge are reflected to new product manufacturing performance of market oriented firms. It is thought that our study also contributes to the evaluation of whether every creative new product idea according to absorbed market intelligence in a market can be manufacturable or not. These research questions have led to evaluation of the specific knowledge-based capabilities of innovative firms. In order to find an answer to the research questions mentioned above, this study was carried out on Turkish companies operating in industrial design based creative industries where creative new ideas and products related innovative practices are frequently emerged by following product differentiation strategy.

2.1. Absorptive capacity and its effect on the manufacturing performance of creative new products

In the literature, there are various perspectives based on utilization of external knowledge about absorptive capacity. Most known definition of absorptive capacity emerged as recognizing, assimilating and applying of new external knowledge for commercial ends (Cohen and Levinthal, 1990). Absorptive capacity definition are also based on perspective of prior knowledge, knowledge network and environment (Tu et al., 2006). Absorptive capacity concept emphasizes gaining of extramural knowledge and relations between external knowledge and absorptive capacity (Lewin et al, 2011). In addition to the existing definitions, efficiency, scope and flexibility of knowledge absorption about transforming of external knowledge into a commercial value are also accentuated. (Van den Bosch et al., 1999). The absorptive capacity was reconceptualized within four dimensions about using of external knowledge which are acquisition, assimilation, transformation and exploitation (Zahra and George 2002). In this direction, these dimensions are summed up under two main groups: potential capacity and realized absorptive capability (Zahra and George 2002). The absorptive capacity

was also defined from learning perspective contains exploratory, transformative and exploitative learning processes about using of external knowledge (Lane et al. 2006). In this context, absorptive capacity definition focusing on knowledge exploration are also taken a place in the literature (Lichtenthaler 2009). Another concept defined as operational absorptive capacity because of the useful knowledge it provides for operational units propounds the relationship between manufacturing function and absorptive capacity of a firm (Tu et al., 2006).

Absorptive capacity assessing knowledge of evolving market requirements provides a company to restructure its resources according to competitive priorities (Escribano et al., 2009; Fernhaber and Patel, 2012; Duchek, 2013). Absorptive capacity takes an influential role between inflows of extramural knowledge and innovative initiatives (Fosfuri and Tribo, 2008; Chen et al., 2009; Larraneta et al., 2012; Moilanen et al., 2014). Hence, it effects innovative performance (Chang et al., 2014; Moilanen et al., 2014). The knowledge flow from external sources is become continuous through absorptive capacity for creative product innovation. External knowledge is no value without the absorptive capacity (U. Lichtenthaler and E. Lichtenthaler, 2009; Scaringella and Burtschell, 2017). Accumulated knowledge by means of combining external and internal knowledge through absorptive capacity is revealed in new product form by transformation of knowledge (Escribano et al., 2009; Chang et al., 2014; Chao et al., 2014; Leal-Rodríguez et al., 2014; Lichtenthaler 2016). Therefore, the role of absorptive capacity in creative industries is much more important. Manufacturing companies in creative industries are in need of benefiting from external knowledge of market generating creative new ideas that are transformed into new products. Therefore, these manufacturers have to actively scan and absorb released knowledge in their network to develop new products on a commercial basis (U. Lichtenthaler and E. Lichtenthaler, 2009; Chang et al., 2014). Successful firms are known to scan much wider than failed firms in a market (Tu et al., 2006). Moreover, external knowledge provides to manufacturers about opportunities and threats in a market (Paiva et al., 2012). From knowledge based perspective, the absorption of external knowledge in new product development process is directly linked to internal capabilities as manufacturing process and utilization of internal knowledge (Grant, 1996; Murray and Chao, 2005; Paiva et al., 2012; Cruz-González et al., 2015; Awwad and Akroush, 2016). Learning through absorptive capacity affects the cost reduction efforts of firms by making process improvements (Scaringella and Burtschell, 2017). Manufacturing types and innovation practices in new product development process require to circulation and effective use of knowledge within an organization (Koufteros and Marcoulides, 2006; Koufteros et al., 2014).

Design affecting strategic product decisions and product life cycle is a significant part of new product development process (Poorkiany et al., 2016). The firms combine design and technical knowledge externally acquired through absorptive capacity with their related previous knowledge to improve new product development performance in accordance with time, cost and product quality. (Abecassis-Moedas and Mahmoud-Jouini, 2008; Scaringella and Burtschell, 2017). In similiar way, firms that manage the knowledge flow by absorbing external knowledge needed for manufacturing flexibility can gain better performance (Patel et al., 2012). Along with improvement in product quality and cost, product design and architecture can cause more efficient manufacturing and shorter delivery time to market (Swink and Nair, 2007). While absorbed knowledge is assessed on the basis of creativity in product design to make a difference in market (Chuang et al., 2015). It is assessed by manufacturing function to achieve the best performance on the basis of competitive priorities (Peter et al., 1998; Sarmiento et al., 2007). Moreover, absorptive capacity can also be developed as a reflection of accumulation of manufacturing practices (Cohen and Levinthal, 1994). Absorptive capacity that provides knowledge flow is naturally related to firm performance in positive way (Campbell, 2007; Roberts, 2015). Because the product architecture that is differentiated with creativity is the main driving element of firm performance (Im and Workman, 2004). Therefore, product design and manufacturability plays a decisive role on manufacturing of creative new products and manufacturing performance (Doll et al., 2010). In addition to design, the inclusion of the production function as early as possible into the new product development process helps to improve the speed of new product development and improve productivity perspectives throughout the process (Kong et al., 2015). The launch of creative new products to meet customer needs is a reflection of the unity of different disciplines such as industrial design, marketing and manufacturing in the new product development process (Veryzer and Borja de Mozota, 2005).

Absorptive capacity provides critical knowledge inputs for manufacturing outputs as creative new products. A firm's manufacturing practices tightly depends on its knowledge management system (Liao and Tu, 2008). Hence, an effect of the absorptive capacity on the manufacturing performance of creative new products is naturally expected. Accordingly, we suggest the following hypothesis:

H1: The firm's absorptive capacity is positively associated with its manufacturing performance of new products.

2.2. Absorptive capacity and market orientation capabilities of innovative firms and the interaction of these capabilities

The market orientation focuses on scanning of market knowledge which is external knowledge for a firm in order to create customer value (Cheng and Huizingh, 2014). This shows that there is a functional similarity between market orientation and absorptive capacity.

Market-focused firms gain market knowledge about their competitors and customers (Slater and Narver, 1995), but they increase the impact of market knowledge to the extent that they can absorb it (Zhang, 2009). Absorptive capacity is linked with market orientation, on the basis of organizational learning (Castro, 2015). Effect of market orientation on new product performance is linked with absorptive capacity. A higher absorptive capacity increases the impact of market orientation on product performance (Najafi-Tavani et al., 2016). Market orientation is influential in the firms' efforts to offer new products to the market using absorbed market knowledge (Vázquez et al., 2001, Najafi-Tavani et al., 2016). The absorptive capacity of a market oriented firm increases creative product innovation by focusing on market knowledge (Chao et al 2014). Market oriented firms have high capacity to absorb market knowledge because they are willing to present new products to the market that satisfy their customers (Mu and Benedetto, 2011).

In the frame of the knowledge-based approach, firms that reduce market obscurity by absorbing market knowledge achieve more successful results in new product development (Liua et al., 2005). While innovative firms meet customer needs, they also consider their competitor's practices through absorbing extramural knowledge from market (Volberda et al., 2010; Serhan et al., 2015) in order to transform market knowledge to commercial end (Cohen and Levinthal, 1990) and to response to new product moves of innovative competitors (Kim et al., 2016). It enables launching more differentiated and creative new products than their competitors' innovative products (Im and Workman, 2004). Concordantly, absorptive capacity concept covers using of extramural knowledge for taking advantage of creative new ideas in market and transforming them into creative new products (Tzokas et al., 2015). Besides, interfunctional coordination which is the subdimension of market orientation, improves outputs of absorptive capacity (Gemser and Leenders, 2011).

From the perspective of interaction between market orientation and absorptive capacity, a firm's existing knowledge accumulation in new product design through absorption of market knowledge about is main basis for market exploitation which enhances process performance about new product development (Blindenbach-Driessen, and F., Van den Ende, 2014). One of the key assumptions in the model is the interaction between innovating firms' absorptive capacity and market orientation. Thus, we suggest the following hypothesis:

H2: The new product manufacturer's absorptive capacity is positively associated with its market orientation.

2.3. Market orientation and its effects on the manufacturing performance of creative new products

Kohli and Jaworski (1990) and Narver and Slater (1990) put basic concepts about market orientation in the literature. Market orientation is conceptualized by building on market knowledge. Within this context, market orientation is composed of three phases according to the organizational usage of market intelligence. These are generation of market intelligence, dissemination of market intelligence and responsiveness to market intelligence (Kohli and Jaworski, 1990). Intelligence generation covers collection of knowledge about customer trends in the market. Intelligence dissemination refers propagation of market knowledge within organizational units. Responsiveness refers an organizational action in the market concerning disseminated market knowledge (Kohli et al., 1993).

Market orientation are defined from perspective of organizational behaviour that contains customer orientation, competitor orientation and interfunctional coordination (Narver and Slater,1990). Customer orientation refers to identifying customer needs and providing the necessary knowledge to meet those requirements (Lukas and Ferrell, 2000, Yang et al., 2012; Gotteland and Boulé, 2006). The main purpose of market oriented companies is to meet customer needs by differentiation strategy (Frambacha et al., 2003, Scaringella and Burtschell, 2017). Customer orientation has a strong relationship with the company's innovation and new product development activities (Tzokas et al., 2015). Customer orientation is main impetus for higher innovation performance (Castro, 2015). Moreover, the inclusion of customers in the new product development process affects the new product development performance in positive way (Brettel and Cleven, 2011). Competitor orientation refers to assess market knowledge about competitors and their actions (Lukas and Ferrell, 2000; Yang et al., 2012; Gotteland and Boulé, 2006). Competitor oriented firms want to be aware of future plans and capabilities of their competitors in order to response their actions according to their strengths and weakness (Gatignon and Xuereb, 1997; Campbell, 2007) Zhou et al., 2009 Wong and Tong, 2012). Therefore, they systematically scan market to analyze market knowledge about their competitors (Spanjol et al., 2011;

Atuahene-Gima and Wei 2011). Interfunctional coordination refers to the allocation of resources and reconfiguration of resources to meet customers' needs (Lukas and Ferrell, 2000; Yang et al., 2012). Interfunctional coordination as a subdimension of market orientation, plays an important role in the new product development process by providing distribution of market knowledge within market oriented firm depending on its organizational communication ability (Grinstein, 2008). Naturally, interfunctional coordination builds a bridge of market knowledge between marketing and manufacturing (Bendoly et al., 2012). After all, market orientation is conceptualized in two categories as reactive market orientation and proactive market orientation. While reactive market orientation focuses on market knowledge to meet the apparent needs of customers, proactive market orientation focuses on market knowledge of hidden needs that are not expressed by the customer (Lütfehik et al., 2012). Competitor and customer-focused learning that provides new knowledge creation is the key element in new product development (McNally et al., 2010; Chuang et al., 2015). Market-focused companies are extremely sensitive to market and market knowledge in order to have advantageous position (Day, 1994). Being aware of market knowledge about changes in other market players' new product actions and customer bias allows to firm to respond appropriately to the market (Gaur et al., 2011). Market orientation is closely related to innovation (Castro, 2015). One of the main strategic responses to market is the new product creation capability which provides a sustainable competitive advantage (Estrada et al., 2016) in the creative industry as in other sectors.

The strategic orientation of a firm is influential on customer orientation and new product development activities. Therefore, a firm's strategic orientation plays a determinative role in its performance (Jeong et al., 2006). There are many findings in the literature regarding the effect of market orientation which is one of strategic orientations on performance of firms by developing new products (I. L. Sandvik and K. Sandvik, 2003; Wong and Ellis, 2007; Augusto and Coelho, 2009). The market orientation of a company affects its performance in line with its business strategy (Matsuno and Mentzer, 2000). Moreover, the interaction between manufacturing and marketing in the new product development process in order to provide customer value has a significant impact on business performance (Bendoly et al., 2012; Kong et al., 2015; Awwad and Akroush, 2016).

In the literature, performance is assessed on the basis of related indicators which are profitability, growth and manufacturing performance (Choe et al., 1997). Manufacturing performance in the context of competitiveness is key underpinning for measuring business performance (Leachman et al., 2005). Market orientation impacts product improvements connected with product quality, speed to market, innovation speed. Hence, market orientation is in close relationship with firm performance (Rodríguez-Pinto, et al., 2011). Market orientation of a firm can feed certain operational functions with market knowledge (Hsu et al., 2014) Therefore, a market oriented firm can shape its manufacturing function in line with market knowledge.

In the literature, manufacturing performance about new products is revealed by measuring manufacturing cost, product quality, delivery speed and manufacturing flexibility which are competitive priorities (Vickery, 1991; Choe et al., 1997; Sarmiento et al., 2007, Gunday et al., 2011). Within the framework of competitive priorities, while quality refers customer expectations about materials and operations, delivery speed refers to reliability of delivery period. Flexibility refers to the ability to adjust product composition and amount of manufacturing according to changing preferences of customers. Cost refers manufacturing capacity, cost reduction and efficiency (Ward et al., 1998; Gaur et al., 2011). Market orientation ensures market knowledge about speed, cost, quality, flexibility for successful manufacturing performance (Gaur et al., 2011). Hence, we suggest the following hypothesis:

H3: The firm's market orientation is positively associated with its manufacturing performance of new products.

3. RESEARCH METHODOLOGY

3.1 Sample and Data Collection

Our survey was made on manufacturing firms which introduced creative new products to the market within last three years in industrial design based creative industries. The research was conducted on manufacturing firms who use industrial design in their creative new product development process participated in the "Design Turkey" industrial design platform between 2008 – 2014.

"Design Turkey" award platform which rewards innovative firms releasing creative new products by using industrial design has been holding every two years from 2008 with the supports of Industrial Designers' Society of Turkey, Republic of Turkey Ministry of Economy and Turkish Exporters Assembly (Design Turkey). Industrial design based creative sectors in "Design Turkey" award platform are classified by the World Design

Organization (WDO), formerly the International Council of Societies of Industrial Design (ICSID). (Design Turkey).

177 utilizable filled questionnaires were collected from classified sectors in data of "Design Turkey" participant directory between 2008-2014 (Table 1). Questionnaire response rate is 45,85%.

Table 1. Demographics of firms (n=177)

Attribute	Categories	f	%
Sector	Packaging and Fast Consumer Goods	20	11
	Lighting	9	5
	Electronics	15	8
	Home Appliances & Personal Care	12	7
	Haousehold Furniture	12	7
	Home & Office Accessories	11	6
	Public Domain Products	5	3
	Office Furniture	14	8
	Sports, Hobby, Games, Toys and Children's Products	14	8
	Medical Devices and Supplies	5	3
	Vehicles and Vehicle Accessories	23	13
	Vitrified Products and Building Components	20	11
	Firm Size	Investment Products and Construction Equipment	17
Micro Business (1-9 employee)		29	16
Small Business (10-49 employee)		71	40
Medium Size Business (50-249 employee)		77	44

Table 2. Demographics of respondents (n=177)

Attribute	Categories	f	%
Position	Mid-Level Manager	34	19
	Senior Manager	52	29
	Top Executive	91	52
Education	Doctoral degree	5	3
	Master's degree	62	35
	Bachelor degree	82	46
	Associate degree	12	7
	High school graduate	16	9
Tenure	1-10	47	26
	11-20	44	25
	21-30	43	24
	31-40	37	21
	41-50	6	4

3.2 Measures

The concept of absorptive capacity (AC) in this article includes sub-dimensions which are the acquisition of knowledge, the assimilation of knowledge, the transformation of knowledge and exploitation of knowledge (Zahra and George, 2002). Acquisition refers identifying and obtaining of extramural knowledge. Assimilation refers deeply analysing of the obtained knowledge. Transformation refers integrating the obtained external knowledge with the existing knowledge. Exploitation refers using of transformed knowledge in operational works (Todorova and Durisin, 2007). Research firms' absorptive capacity (AC) was measured by the measurement items adapted from Flatten et al., (2011).

The concept of market orientation (MO) in this article includes sub-dimensions which are customer orientation, competitor orientation and inter functional coordination (Narver and Slater, 1990). Customer orientation refers focusing on knowledge about customers. Competitor orientation refers focusing on knowledge about competitors. Interfunctional coordination focusing on knowledge about interaction among organisational functions (Hult et al.,2005). Research firms' market orientation was measured by the measurement items adapted from Narver and Slater, (1990).

The definition of manufacturing performance of new product (NPMP) in this article includes sub-dimensions which are cost, quality, flexibility and delivery speed (Liao and Tu, 2008). Competitive priorities about cost, quality, delivery speed and flexibility are taken into consideration in our article because of the most known relationship between manufacturing performance and competitive priorities in the literature. Research firms'

manufacturing performance about creative new products was measured by the measurement items adapted from Liao et al., (2010). All items was measured by a five-point Likert scale.

3.4 Analyses and Results

3.4.1 Data Analyses

The results of the factor analysis are shown in table 3. 51,98% of the total variance is explained. Each variable was found to be positively and highly correlated and the most appropriate factor structure was reached. The smallest factor load is .419 and the highest factor load is .799.

Table 3. Factor loadings

Items	MO	AC	NPMP
MOCPO1 Our sales team regularly shares information about the strategies of our competitors within the company.	,449	,419	
MOCPO2 We respond quickly to the competitive threats that threaten us.	,529		
MOCPO3 Our top management regularly discusses the strengths and strategies of our competitors.	,706		
MOCPO4 We aim to create opportunities for competitive advantage.	,692		
MOCUO1 Our strategy for competitive advantage is based on "understanding customer needs".	,702		
MOCUO2 Our company strategies are determined in line with our belief in creating greater value for our customers.	,622		
MOCUO3 Our company's objectives are primarily determined on the basis of "customer satisfaction".	,715		
MOCUO4 We measure customer satisfaction systematically.	,765		
MOCUO5 We often measure customer satisfaction.	,770		
MOCUO6 We care after service.	,620		
MOCUO7 Our company collects constant information about our customers' needs, desires and requirements.	,711		
MOCUO8 Our potential customers are involved in the new product development process.	,677		
MOCUO9 Our company clearly shares relevant information with its customers.	,579		
MOCUO10 We constantly monitor our level of commitment and focus in line with the needs of the customers we serve.	,751		
MOIFC1 Our top managers in all departments regularly visit our existing customers.	,656		
MOIFC2 Our top managers in all departments regularly visit our potential customers.	,612		
MOIFC3 Our managers know how employees can value their customers.	,634		
MOIFC4 All departments are sensitive to each other's demands and needs.	,595		
MOIFC8 All functional groups work in a common way to solve problems.	,568		
ACAC2 Our management is motivating employees to use information resources related to our industry.		,572	
ACAC3 Our management expects employees to be interested in much more advanced information from the industry.		,626	
ACAS1 Our company has ideas and concepts, consulted with other departments.		,761	
ACAS2 Our management stresses that problems should be solved with the support of other departments.		,585	
ACAS3 If a department obtains important information, it is quickly delivered to all units and departments in our company.		,549	
ACAS4 Our management regularly holds meetings with all other departments to exchange views on new developments.		,663	
ACTR1 Our employees have the ability to use the collected information by adapting it to company activities.		,674	
ACTR2 Our employees are able to absorb new knowledge to make preparations for different purposes.		,722	
ACTR3 Our employees are able to successfully match existing knowledge with new insights.		,671	
ACTR4 Our employees can put new information into product design studies.		,582	
ACEX1 Our management supports the development of prototypes.		,628	
ACEX2 Our company regularly revises the technology of product design and adapts it according to new information.		,588	
ACEX3 Our company has the ability to work more productively with new technology related to product design.		,585	
*NPMP(..) In the last three years,compared to our competitors.			
NPMPQ6 the number of product returns from our customers has decreased			,486
NPMPPC1 our input costs have decreased			,766
NPMPPC2 our staff costs have decreased			,667
NPDMC3 our staff's productivity has improved			,766
NPDMC4 our transaction costs have decreased			,799
NPMPCC5 the total costs of internal and external logistics processes have decreased			,796
NPMPCC6 the total cost of manufacturing has decreased			,818
NPMPPF1 our flexible manufacturing capability has been increased			,621
NPMPPT1 the time between the receipt of the order and the delivery has been reduced			,697
NPMPPT2 the time between the start of the manufacturing process and the delivery has been reduced			,726
NPMPPT3 delivery speed of finished products has been increased			,560
NPMPPT4 our ability of keeping promises of delivery has been increased			,594
NPMPPT5 our ability to deliver on time has been increased			,606
NPMPPT6 the difficulties with regard to distribution and delivery have been minimized			,593

*The NPMP questions were asked according to the last three years and compared to competitors.

Explained total variance: %51,98

AC: Absorptive Capacity, MO: Market Orientation, NPMP: Manufacturing Performance of New Product

3.4.2 Reliability Analysis

The reliability analyses of the variables were done before the correlation and regression analyses and hypotheses testing. Table 4 lists the Cronbach's alpha values of the reliability analyses. In the literature, the adequate requirement of the Cronbach's alpha values is 0.7. The analyses show that all the Cronbach's alpha values are above 0.70 and have internal consistency so that it is appropriate for further analysis (Nunnally, 1978). The Cronbach's alpha coefficients are shown in Table 4.

Table 4. Results of the Reliability Analysis

	Variables	CrA
1	AC	,92
2	MO	,94
3	NPMP	,92

3.4.3 Correlation Analysis

When the correlation results between the variables are examined, there is a positive and statistically significant relationship between absorptive capacity and new product manufacturing performance at $p < 0.01$ level. Table 5 shows that there is a significant correlation between absorptive capacity and market orientation ($r = 0.582$, $p < 0.01$). In addition to this, there is a significant correlation between absorptive capacity and new product manufacturing performance ($r = 0.438$, $p < 0.01$). There is no significant correlation between market orientation and new product manufacturing performance ($r = 0.277$, $p < 0.01$).

Table 5. Correlation Analysis Result

		μ	δ	AC	MO
1	AC	3,99	,65		
2	MO	3,80	,66	,582(**)	
3	NPMP	3,75	,72	,438(**)	,277(**)

** $P < 0.01$

3.4.4 Regression Analysis

Multiple regression analysis was used to test hypotheses. The regression analysis results are shown in Table 6.

Table 6. Regression Analysis Results

	Model 1 MO		Model 2 NPMP	
	Beta	Sig.	Beta	Sig.
AC	,582	,000**	,034	,736
MO	-	-	,419	,000**
R^2	,338		,193	
F	63,911		14,806	
$Sig.$.000		.000	

** $P < 0.01$

When Table 5 is examined, the Model 1 in which the absorptive capacity effects on market orientation is investigated is statistically significant ($F = 63.911$; $p < 0,01$). The explanation power of the model 1 is calculated as $R^2 = 0.338$. Regression analysis showed that absorptive capacity ($\beta = 0.582$, $p < 0.01$) has a statistically significant and positive effect on market orientation. Therefore, H2 is supported.

When Table 5 is examined, the Model 2 is statistically significant ($F = 14.806$; $p < 0,01$). The explanation power of the model 2 is calculated as $R^2 = 0.193$.

Regression analysis showed that absorptive capacity ($\beta = 0.034$, $p > 0.01$) is not statistically significant. Therefore, H1 is not supported. However, the market orientation is statistically significant ($\beta = 0.419$, $p < 0.01$) on new product manufacturing performance. Therefore, H3 is supported. The firm's market orientation is positively associated with its manufacturing performance of new products.

4. DISCUSSION AND CONCLUSION

This study contributes to knowledge and organizational learning based literature through investigating the relationships MO, AC and NPMP in industrial design based creative industries. In this regard, it is investigated the impacts of knowledge based capabilities on creative new products through their interaction with operational capabilities. The effect of absorptive capacity as intangible knowledge based resource of research firms on their creative new product manufacturing performance are evaluated in term of transforming knowledge into a tangible new product (Rodríguez-Pinto, et al., 2011). Knowledge-based organizational capabilities based on creativity enable competitive differentiation (Racela, 2014). Hence, an assessment is undertaken on issues of our research in the field of industrial design based creative industries in this paper. Unlike previous studies, this study focuses on not only interaction of absorptive capacity and market orientation about business performance but also their effects on manufacturing performance of creative new products. In our study, from the perspective of absorptive capacity, it is evaluated how the external knowledge exploited by market oriented firms affects the product ideas and how it is reflected to manufacturing performance of creative new products.

Theoretically, It is expected that the manufacturing processes of innovative firms are shaped by absorbed market knowledge and creative new products are emerged on the market accordingly. Whereas, our research shows that innovative firms in industrial design based creative industries don't consider absorptive capacity in manufacturing phase in new product development. While our statistical results support AC-MO (H2) and MO-NPMP (H3) associations in positive way, but, they do not support AC- NPMP (H1) association in positive way. The results of our study show that there is a positive relationship between absorptive capacity and market orientation as well as a positive relationship between market orientation and new product manufacturing performance. However, it releases that research firms are not in need of absorptive capacity in manufacturing process about creative products. Firms can achieve a more competitive position than their competitors by launching creatively designed new products. Therefore, while they try to create their own markets with creative new products, they can not take into account absorptive capacity for manufacturing due to their overconfidence in creative differentiation. While superior new products based on high creativity can provide competitive advantage, these products can subject to the risk of uninterested customer. Because the firm's creativity can go well beyond the expectations of the customers. For this reason, market intelligence as an external knowledge should be absorbed by market players.

The product design strategy implemented within the product differentiation framework ensures competitive advantage by creating a unique market as well as meeting market needs. Product design strategy uses the industrial design as a strategic competitive tool and enables the firm to gain competitive advantage against their competitors by affecting and achieving competitive priorities targets (Tarasewich, 1996). While a market oriented manufacturer should consider the manufacturing constraints such as material and manufacturing costs in the new product development process, the designer should approach product design from a creative point of view (Abecassis-Moedas and Mahmoud-Jouini, 2008). The design has to take into account the perspectives of related disciplines such as manufacturing as well as the creative perspective it has (Wuest et al., 2015). From manufacturing perspective, creatively designed products must be manufacturable. Thus, the concept of design for manufacturing covers evaluating of product design in terms of ease of manufacturing (Tarasewich, 1996). Manufacturability timely meets customer demands by delivering on time and lowering costs as well as increasing product quality in flexible way (Doll et al., 2010).

Managers may need to consider this study about investment decisions of their own absorptive capacity when allocating resource for new product manufacturing in industrial design based creative industry in the frame of organizational learning. Additionally, managers should consider competitive role of industrial design and manufacturability in new product development process and plan manufacturing process in line with competitive priorities. In this context, firms should not only rely on their own external knowledge sources, but also develop their absorptive capabilities (Matthyssens et al., 2005). For this reason, absorptive capacity which is a positive relationship with market orientation should also be taken into account in order to gain competitive advantage by manufacturing of creative products.

We hope that our work with creative new product perspective will assist relevant researchers on the relationship between manufacturing and absorptive capacity in the framework of competitive priorities. Future study may investigate relations of these variables under environmental effects such as market turbulence and competitive intensity. Because firms operate in environmental turbulence, environmental effects on the relationships could give further insights.

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