

## UNLOCKING THE POTENTIAL: THE IMPACT OF INNOVATIVE CAPABILITY ON PROCESS, PRODUCT, AND MARKET INNOVATION AND FIRM PERFORMANCE

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**Abstract:** *This research study aims to investigate the role of innovative capability in relation to process innovation, product innovation, and market innovation and how they lead to firm performance. In the context of Pakistan, this research is vital as it can guide IT companies in understanding how to improve their innovative capability and therefore their performance in terms of process, product, and market innovation. Data was collected from the employees of software houses in Lahore, Pakistan, using convenience sampling. A structured research questionnaire was designed based on the validated scales. There were a total of 54 items to measure the 8 constructs (Market orientation, Entrepreneurial orientation, customer orientation, innovative capability, process innovation, product innovation, market innovation, and firm performance). By understanding the link between innovative capability and firm performance, companies can improve their ability to introduce new products, services, and marketing practices that meet the needs of their customers. All the relationships have been accepted with p-value less than 0.05, meaning that they are statistically significant. The t-value of each relationship indicates that they are all significant as well, with values greater than 2. Additionally, the beta value also indicates that the strength of all the relationships is positive, in other words, all of the predictors (MO, EO, CO, IC) have positive correlations with their respective criterion variables (PI, MI, PrI, FP). Overall, the mediation analysis revealed significant relationships between innovative capability (IC) and the outcome (FP) through the mediating variables of process innovation (PrI), product innovation (PI), and market innovation (MI). The findings of this study can also be used as a tool to help practitioners and researchers in different industries and across different countries understand how they can align their business strategy with innovative capabilities to achieve better results. Finally, the research results can serve as a basis for future research in the field, providing a foundation for the development of new theoretical models and techniques for measuring and enhancing innovative capability. This research on "innovative capability" and its impact on a company's performance and ability to create new products and enter new markets can have a significant impact on society by helping businesses to be more competitive and efficient, leading to economic growth and potentially creating new jobs. Additionally, advancements in products and processes can also improve the overall quality of life for consumers. These findings are based on the specific sample used in this particular study and more research would be needed with other control and moderating variables in the specific context of Pakistan. Furthermore, the generalizability of these results may be limited, as this study might not have captured the entire population of IT firms operating in Pakistan.*

**Keywords:** competitive advantage, competitive environment, firm performance, global trends, innovative capability, market innovation.

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**Introduction.** In today's dynamic and highly competitive business landscape, companies actively face ongoing challenges driven by the rapid emergence of new technologies and evolving business models (Himanen et al., 2019). To thrive in this environment and achieve long-term success, firms must consistently innovate and enhance their products, processes, and services (de Medeiros et al., 2022). Innovative capability plays a critical role in shaping a company's performance and encompasses the ability to generate and implement new ideas, products, and procedures, enabling firms to adapt to market changes and outperform competitors (Sultana et al., 2022a).

Companies actively empower themselves by introducing process innovation, which involves developing new or significantly improving service or delivery processes. This enables them to streamline operations, maximize efficiency, and reduce costs, enhancing their competitive edge and profitability (Akman and Yilmaz, 2008, 2019). Similarly, companies actively differentiate themselves and drive revenue growth by developing and introducing new or substantially enhanced products or services through product innovation (Piening and Salge, 2014). Market innovation, on the other hand, involves actively adopting new marketing methods, business models, or distribution channels to reach customers in novel or distinctive ways (Jeong and Chung, 2023). By actively embracing fresh ideas and techniques, companies effectively target their audience, establish strong customer relationships, and grow their market presence. Research has consistently shown that firms with higher levels of innovative aptitude actively engage in process innovation, resulting in improved operational efficiency, cost savings, and productivity (Raimi and Tariq, 2022). Furthermore, organizations with strong innovative capabilities are actively positioned to offer and commercialize new products and services, leading to revenue growth and market presence. When specifically considering the software industry, the importance of innovative capabilities becomes even more essential (Islam and Munir, 2022). The software sector operates in a rapidly evolving technological landscape, where companies must actively engage in continuous innovation to remain competitive. Technological advancements, globalization, and digital transformation actively reshape the software industry in both developed and developing countries. Particularly in developing countries, businesses actively leverage these factors to make significant strides in the global software market.

Developing countries increasingly recognize the potential of the software industry as a driver of economic growth and job creation (Roshchik et al., 2022). Governments in these nations actively enact laws, provide incentives, and implement infrastructure development projects to actively promote and support the expansion of the software sector (Awad and Albaity, 2022; Dahmani et al., 2022). By actively investing in education and training programs, cultivating a skilled workforce, fostering entrepreneurship, and creating supportive ecosystems, these countries actively nurture a thriving software industry (Pradhan et al., 2022).

Furthermore, the availability of modern technological tools, frameworks, and platforms actively makes software development more accessible and affordable, enabling developing countries to compete in the global software market (Afawubo and Noglo, 2022). Globalization and outsourcing actively create opportunities for developing countries to provide software services to clients worldwide, attracting foreign investment and expanding their software sector.

In Pakistan, where the economy is rapidly growing, innovation and competitiveness are especially important for IT companies to keep up with global trends. In the context of Pakistan, this research is vital as it can guide IT companies in understanding how to improve their innovative capability and therefore their performance in terms of process, product, and market innovation. The findings of this study will help managers and policymakers to better understand the importance of innovative capability for IT firms operating in Pakistan, and to identify strategies for improving it. However, there is a lack of research that specifically examines the role of innovative capability in driving process, product, and market innovation and its impact on firm performance in Pakistan. The research aims to explore the relationship between innovative capability and various forms of innovation and firm performance and to identify the key drivers of innovative capability in Pakistani IT companies.

**Literature Review.** Grounded on the theoretical foundation of the resource-based view (RBV) theory, this research paper investigates the relationship between innovation capability and firm performance. According to RBV, a firm's competitive advantage, and superior performance are contingent upon its unique and valuable resources, including its innovative capabilities (Barney et al., 2001). In a study conducted by Akman and Yilmaz (2019) on software firms, a positive association between innovation capability and firm performance was identified. The researchers emphasized that software companies with strong innovative capabilities are more inclined to develop cutting-edge software solutions, adapt to technological advancements (Boeing et al., 2022), and cater to evolving customer needs, thereby experiencing enhanced performance in terms of

customer satisfaction (Choudharya et al.), market share (Lian et al., 2022), and financial outcomes (El Chaarani et al., 2022).

Organizations endowed with robust innovative capabilities are strategically positioned to introduce and market new products and services, which contributes to revenue growth and establishes a strong market presence (Koc and Ceylan, 2007; Piening and Salge, 2014). These findings are in line with the fundamental principles of the RBV theory, which accentuates the significance of unique and valuable resources, including innovation capability, in driving firm performance (Barney et al., 2001). By leveraging their innovative capabilities, firms can cultivate and leverage resources that are challenging to imitate or substitute, ultimately attaining a sustainable competitive advantage in the dynamic business landscape. By employing RBV as the theoretical foundation, this study aims to explore the strategic implications of innovation capability on firm performance and gain insights into how firms can effectively leverage their resources to achieve and sustain a competitive advantage in today's dynamic business environment.

Market orientation refers to a business strategy in which a company prioritizes understanding and responding to the needs of its customers. This can include conducting market research, gathering customer feedback, and continuously monitoring changes in consumer preferences. Innovative capability refers to a company's ability to generate and implement new ideas, products, and processes. A company with a strong innovative capability is often able to stay ahead of the curve and offer unique solutions to meet customer needs (Sultana et al., 2022b).

There is a significant body of literature that supports the relationship between market orientation and innovative capability (Ode and Ayavoo, 2020). Many researchers have found that a market-oriented approach is positively related to a firm's innovative performance. For example, a study by Narver and Slater (1990) found that market-oriented firms were more successful at developing new products and services than firms that were not market-oriented. Another study by (Cai et al., 2015) found that a market orientation was positively related to the level of technological innovation in a firm. Research by Kajalo and Lindblom (2015), had shown that a Market Orientation strategy adopted by firms leads to a greater number of successful new products. These studies and others like them provide substantial evidence to support the positive relationship between market orientation and a firm's innovative capability.

**H1:** MO has a positive significant relationship with IC

Entrepreneurship orientation (EO) refers to a mindset or approach that values and encourages the pursuit of opportunities for innovation and growth, as well as the willingness to take risks to achieve these goals (Covin & Lumpkin, 2011). A company with a strong EO is often characterized by a proactive, innovative, and adaptive culture that is constantly on the lookout for new opportunities (Makhloufi et al., 2021). Many studies have investigated the relationship between EO and innovative capability. Many researchers have found that a company's EO is positively related to its ability to develop and implement new products, services, and processes (Ferreira et al., 2020). A study by Sheng and Chien (2016) found that companies with strong EO were more likely to engage in product innovation and introduce new products to the market. In addition, studies by Morgan and Berthon (2008) suggest that EO is positively related to the rate of product innovation in a company. They also propose that companies with a strong EO tend to be better at identifying and pursuing new market opportunities, which in turn leads to more successful new product development. Overall, the literature suggests that companies with a strong EO are more likely to engage in product innovation and to introduce new products to the market, also companies with a strong EO tend to be better at identifying and pursuing new market opportunities, which in turn leads to more successful new product development. Therefore, Entrepreneurship orientation is positively related to innovative capability.

**H2:** EO has a positive significant relationship with IC

Customer orientation refers to a business strategy in which a company focuses on understanding and satisfying the needs of its customers. This can include gathering customer feedback, monitoring changes in consumer preferences, and using this information to guide the development of new products and services (Chaudhry et al., 2019). Several studies have investigated the relationship between customer orientation and innovative capability. Many of these studies have found that companies with a strong customer orientation are more likely to engage in product innovation and introduce new products to the market (Racela & Thourungroje, 2020; Yopan et al., 2022). A study by Wang et al. (2016) found that more customer-oriented companies were more successful at developing new products and services than companies that were less customer-oriented. More customer-oriented companies are more likely to identify and exploit new market opportunities, which in turn leads to new product development and introduction (Racela, 2014). Research by Sultana et al. (2022b) suggests that customer orientation leads to a better understanding of customer needs

and wants, which leads to more successful new product development. Overall, the literature suggests that more customer-oriented companies tend to be more effective at identifying and pursuing new market opportunities, and have a better understanding of their customers' needs and wants, which leads to more successful new product development (Chaudhry et al., 2019). Therefore, customer orientation is positively related to innovative capability.

**H3:** CO has a positive significant relationship with IC

*Innovation Capability relationship with Process, Product, and Market Innovation.* Innovation is the key to remaining competitive in today's competitive business world. Manual (2005) classified innovation into four types of innovation – process, product and market, and organizational innovation. Innovation (Product Innovation, Process Innovation, Market Innovation) refers to the introduction of new or improved products, processes, or business models. Product Innovation refers to the introduction of new or improved products, Process Innovation refers to the introduction of new or improved processes, and Market Innovation refers to the introduction of new or improved ways of reaching and serving customers. The literature suggests that companies with strong IC are more likely to engage in Process Innovation (PrI). Many of these studies have found that companies with strong IC are more likely to engage in PrL (Koc and Ceylan, 2007; Yusr, 2016). Companies with strong innovative capabilities were more likely to introduce new or significantly improved production or delivery processes than companies with weak innovative capabilities (Piening and Salge, 2014). Another study by Xie et al. (2019) found that companies that were more innovative in product development were also more innovative in process development. Several theoretical models have been proposed to link innovative capability and process innovation, such as the “Innovative Capability - Resource-based View - Process Innovation” framework proposed by Sher and Yang (2005) and the “Innovative Capability - Open Innovation - Process Innovation” framework proposed by Chesbrough (2003).

**H4:** IC has a positive significant relationship with PrL

Similarly, innovation capability has a strong and positive relationship with product innovation (Yeşil and Doğan, 2019). A study by Weerawardena et al. (2006) found that companies with a higher level of innovative capability had a greater number of successful new products. Theoretical frameworks also suggest that innovative capability can impact product innovation through a company's resource base and its adoption of open innovation approach.

**H5:** IC has a positive significant relationship with PI

There is a body of literature that investigates the relationship between innovative capability and market innovation (Akman and Yilmaz, 2019). Studies have found that companies with strong innovative capabilities tend to be more successful in introducing new marketing practices, business models, and distribution channels (Eng and Okten, 2011). Companies with high innovative capability are more likely to identify and exploit new market opportunities, which lead to market innovations.

**H6:** IC has a positive significant relationship with MI

*Process, Product, and Market Innovation Relationship with Firm Performance.* Firm performance can be measured in various ways such as financial performance, productivity, and market share. There is a significant body of literature that examines the relationship between process innovation and firm performance (Huhtala et al., 2014). Many studies have found that companies that engage in process innovation tend to have better firm performance compared to companies that do not engage in process innovation. For example, a study by Karlsson and Tavassoli (2015) found that process innovation is positively related to firm performance in terms of productivity, financial performance, and market share. Companies that invest in process innovation tend to experience growth in terms of sales and employment (Kalay and Gary, 2015).

**H7:** PrI has a positive significant relationship with FP

Many studies have found that companies that engage in product innovation tend to have better firm performance compared to companies that do not engage in product innovation. For example, a study by Cooper (2001) and Ramadani et al. (2019) found that companies that introduce new products tend to experience higher growth in terms of sales and employment than companies that do not introduce new products. Companies that invest in product innovation tend to experience growth in terms of sales and employment (Lee et al., 2019; Lin et al., 2013).

**H8:** PI has a positive significant relationship with FP

The literature suggests that market innovation is positively related to firm performance, measured in terms of financial performance, productivity, and market share (Kocak et al., 2017). Companies that invest in market innovation tend to experience growth in terms of sales and employment (Lee et al., 2019). Theoretical



frameworks also suggest that market innovation can impact firm performance through a company's resource base and its adoption of open innovation approach.

**H9:** MI has a positive significant relationship with FP

*Mediating Role: Innovative Capability - Process, Product, and Market Innovation - Firm Performance.*

The relationship between Orientation and Innovation can be mediated by Innovation Capability. Many studies have used the innovation capability as a mediator to understand its effect on the financial performance of the companies (Huhtala et al., 2014; Urgal et al., 2013). For example, the study of Huhtala et al. (2014) looked at the relationship between market orientation and business performance whereas the study of Urgal et al. (2013) found the positive impact of IC on the relationship between knowledge resources and innovation performance. Innovation capability has acted as a full mediator in the study of Mokhtar and Don (2014). This study found a strong relationship between knowledge management and innovation through innovation capability. A company with a strong market orientation, entrepreneurial orientation, and customer orientation will be more likely to have a strong innovation capability, and thus be more likely to innovate (Zehir et al., 2015). A company with a strong innovation capability will be more likely to introduce new or improved products, processes, and business models, which can help the company to be more competitive in the marketplace. A company that focuses on understanding and meeting the needs of its customers, and has the willingness to take risks and pursue new opportunities, will tend to develop better innovation capability, which will allow the company to be more successful in introducing new or improved products, processes, and business models.

**H10:** IC mediates the relationship between MO and PrI.

**H11:** IC mediates the relationship between MO and PI.

**H12:** IC mediates the relationship between MO and MI.

**H13:** IC mediates the relationship between EO and PrI.

**H14:** IC mediates the relationship between EO and PI.

**H15:** IC mediates the relationship between EO and MI.

**H16:** IC mediates the relationship between CO and PrI.

**H17:** IC mediates the relationship between CO and PI.

**H18:** IC mediates the relationship between CO and MI.

The relationship between innovation capability and firm performance can be mediated by innovation. A company with a strong innovation capability is more likely to introduce new or improved products, processes, and business models, which can lead to improved firm performance (Bahta et al., 2021). It has been noted in a study by Agyapong et al. (2017) that innovation has a positive impact as a mediator between social capital and firm performance. For example, a company that can introduce new products that are well-received by customers will likely see an increase in revenue and market share (Rajapathirana & Hui, 2018). Similarly, a company that can improve its processes in a way that reduces costs and increases efficiency will likely see an improvement in its financial performance. The study hypothesized that a company with a strong innovation capability, that translates into the successful introduction of new or improved products, processes, and business models, will tend to have better firm performance, measured in financial and non-financial terms.

**H19:** PrI mediates the relationship between IC and FP.

**H20:** PI mediates the relationship between IC and FP.

**H21:** MI mediates the relationship between IC and FP.

**Methodology and research methods.** *Sample size and Data collection.* For this research study, data was collected from the employees of software houses in Lahore, Pakistan, using convenience sampling. The data was gathered through an online survey link that was provided to the managers of the software houses, who then forwarded the link to their employees. The survey link was accompanied by a letter to assure respondents that their answers would be kept anonymous and that no personal identifying information was collected. A total of 316 responses were received, with 67% of them being from male participants and 33% from female participants. The demographic analysis showed that the majority of respondents (49%) were between the ages of 21 and 30, 39% were between 31 and 40, 8% were between 41 and 50, and 4% were between 51 and 60. The survey was conducted between December 2021 and March 2022.

*Measures.* A structured research questionnaire was designed based on the validated scales. There were a total of 54 items to measure the 8 constructs (Market orientation, Entrepreneurial orientation, customer orientation, innovative capability, process innovation, product innovation, market innovation, and firm performance). All the items were measured on a 5-point Likert scale. Kohli et al. (1993) 12-item scale with an alpha value of 0.74 was used to measure customer orientation. The 9-item scale of market orientation and 05 item scale of entrepreneurship orientation were used in the study which was developed by (Li et al., 2006).

The scale of IC was derived from Akman and Yilmaz (2019) and it has total 06-items with an alpha 0.86. A 6-item scale of product innovation and a 05-items scale of process innovation were derived from Ali et al., (2008). The 6-item scale developed by (Zhou et al., 2005) was used to measure market Innovation. The 05-item scale of Jeffery et alio (2013) was used to measure the firm performance.

**Table 1. Demographics**

Criteria	Category	Frequency (n=316)	Percentage
Gender	Male	212	67.10
	Female	104	32.90
Age	21 to 30 years	156	49.40
	31 to 40 years	124	39.20
	41 to 50 years	25	7.90
	51 to 60 years	11	3.50
Education	Bachelor	186	58.90
	Master	117	37.00
	MS/MPhil	11	3.50
	PhD	2	0.60
Marital Status	Married	114	36.10
	Unmarried	196	62.00
	Divorced	4	1.30
	Widow	2	0.60

Note: \$I\sim Rs.185; n – 316 Final Responses for Data Analysis.

Sources: developed by the author.

Table 1 provides information about the demographic variables of the current study. These variables are treated as control variables in this research.

*Measurement Model Assessment.* The PLS-SEM analysis was applied using Smart PLS 3.3.3 (Ringle et al., 2015). Two stages process consisting of the assessment of the measurement model and the assessment of the structural model were followed (Hair et al., 2021).

*Common Method Variance.* The results of the Harman single-factor analysis were confirmed by a full collinearity test. The VIF values for all constructs were within the range of 1.000 to 1.909 ( $\leq 3.3$ ), indicating no multicollinearity existed in the data. According to the results, the first four parameters met the criterion established by Hair et al. (2021)  $\alpha > 0.7$ ,  $AVE > 0.5$ ,  $CR > 0.7$ , and  $Loading > 0.7$  as illustrated in Table 2. This suggests that the model is reliable and has convergent validity.

**Table 2. Measurement Model: VIF, Reliability, and Convergent Validity**

Construct	Code	Loading	VIF	Cronbach's Alpha	CR	AVE
Market Orientation	MO1	0.829	3.245	0.908	0.922	0.570
	MO2	0.691	1.726			
	MO3	0.827	2.288			
	MO4	0.808	2.698			
	MO5	0.774	2.228			
	MO6	0.740	2.277			
	MO7	0.667	1.784			
	MO8	0.755	1.772			
	MO9	0.680	1.915			
Customer Orientation	CO1	0.600	2.196	0.935	0.941	0.571
	CO2	0.719	2.990			
	CO3	0.739	3.843			
	CO4	0.744	4.316			
	CO5	0.862	4.310			
	CO6	0.759	3.123			
	CO7	0.753	2.162			
	CO8	0.790	3.453			
	CO9	0.768	2.675			
	CO10	0.808	3.920			
	CO11	0.799	3.331			
	CO12	0.693	1.943			

**Continued Table 2**

Construct	Code	Loading	VIF	Cronbach's Alpha	CR	AVE
Entrepreneurship Orientation	EO1	0.865	2.780	0.892	0.920	0.699
	EO2	0.897	3.290			
	EO3	0.780	1.971			
	EO4	0.818	2.180			
	EO5	0.814	1.934			
Innovative Capabilities	IC1	0.914	4.896	0.887	0.915	0.642
	IC2	0.758	2.198			
	IC3	0.786	2.223			
	IC4	0.778	1.807			
	IC5	0.740	1.734			
	IC6	0.820	2.675			
Market Innovation	MI1	0.814	2.158	0.901	0.923	0.669
	MI2	0.867	3.552			
	MI3	0.708	1.849			
	MI4	0.830	2.493			
	MI5	0.816	2.984			
	MI6	0.860	2.634			
Process Innovation	PI1	0.925	4.044	0.864	0.903	0.651
	PI2	0.755	1.688			
	PI3	0.724	1.803			
	PI4	0.778	1.827			
	PI5	0.837	2.373			
Product Innovation	PrI1	0.885	3.272	0.866	0.900	0.600
	PrI2	0.739	2.010			
	PrI3	0.736	1.713			
	PrI4	0.767	1.954			
	PrI5	0.778	2.025			
	PrI6	0.733	1.693			
Firm Performance	FP1	0.877	4.266	0.816	0.871	0.576
	FP2	0.685	1.508			
	FP3	0.703	1.804			
	FP4	0.695	1.215			
	FP5	0.815	3.128			

Note: VIF – Variance inflation factor, CR – Composite reliability, AVE – Average variance extracted.

Sources: developed by the author.

Discriminant validity is established when the correlation between two construct measures is less than 0.85 (Hair et al., 2021). From Table 3, we can see that most of the values are less than 0.85, indicating that the construct measures are measuring different constructs. For example, the correlation between customer orientation (CO) and market innovation (MI) is 0.274, which is less than 0.85, indicating discriminant validity.

**Table 3. Discriminant Validity (HTMT<0.85)**

	CO	EO	FP	IC	MI	MO	PI	PrI
CO	0.755							
EO	0.459	0.836						
FP	0.372	0.18	0.759					
IC	0.473	0.533	0.492	0.801				
MI	0.274	0.281	0.598	0.45	0.818			
MO	0.273	0.34	0.167	0.468	0.195	0.755		
PI	0.485	0.44	0.596	0.663	0.673	0.428	0.807	
PrI	0.379	0.078	0.432	0.457	0.288	0.199	0.469	0.775

Note: FP – Firm Performance, IC – Innovative Capability, MI – Market Innovation, PrI – Product Innovation, PI – Process Innovation, CO – Customer Orientation, EO – Entrepreneurship Orientation, MO – Market Orientation

Sources: developed by the author.

**Hypotheses Testing.** Once the measurement model was determined to be accurate and valid, the structural model was assessed. A bootstrap method with 5000 iterations was used to test the hypothesis (Hair et al.,

2021). Table 4 presents the results of a data analysis that examines the relationships between various constructs, as well as the strength and significance of those relationships.

MO (Market Orientation) -> IC (Innovative Capability): The relationship between the company's market orientation and its innovative capability is being tested. The estimated value of the regression coefficient ( $\beta$ ) is 0.292, indicating a positive relationship between the two constructs, meaning that a more market-oriented company tends to have higher innovative capability. The t-value (7.422) and p-value (0.000) indicate that this relationship is statistically significant.

EO (Entrepreneurship Orientation) -> IC (Innovative Capability): The relationship between a company's entrepreneurship orientation and its innovative capability is being tested. The estimated value of the regression coefficient ( $\beta$ ) is 0.321, indicating a positive relationship between the two constructs, meaning that a more entrepreneurship-oriented company tends to have a higher innovative capability. The t-value (5.783) and p-value (0.000) indicate that this relationship is statistically significant.

CO (Customer Orientation) -> IC (Innovative Capability): The relationship between a company's customer orientation and its innovative capability is being tested. The estimated value of the regression coefficient ( $\beta$ ) is 0.246, indicating a positive relationship between the two constructs, meaning that a more customer-oriented company tends to have higher innovative capability. The t-value (4.963) and p-value (0.000) indicate that this relationship is statistically significant.

IC (Innovative Capability) -> PrI (Process Innovation): The relationship between a company's innovative capability and its process innovation is being tested. The estimated value of the path coefficient (which is similar to the beta coefficient) is 0.457, indicating a positive relationship between the two constructs, meaning that companies with higher innovative capability tend to have better process innovation. The t-value (9.934) and p-value (0.000) indicate that this relationship is statistically significant.

IC (Innovative Capability) -> PI (Product Innovation): The relationship between a company's innovative capability and its product innovation is being tested. The estimated value of the path coefficient is 0.663, indicating a positive relationship between the two constructs, meaning that companies with higher innovative capability tend to have better product innovation. The t-value (20.304) and p-value (0.000) indicate that this relationship is statistically significant.

IC (Innovative Capability) -> MI (Market Innovation): The relationship between a company's innovative capability and its market innovation is being tested. The estimated value of the path coefficient is 0.450, indicating a positive relationship between the two constructs, meaning that companies with higher innovative capability tend to have better market innovation. The t-value (8.520) and p-value (0.000) indicate that this relationship is statistically significant.

PrI (Process Innovation) -> FP (Firm Performance): The relationship between a company's process innovation and its firm performance is being tested. The estimated value of the path coefficient is 0.208, indicating a positive relationship between the two constructs, meaning that companies with better process innovation tend to have higher firm performance. The t-value (4.068) and p-value (0.000) indicate that this relationship is statistically significant.

PI (Product Innovation) -> FP (Firm Performance): The relationship between a company's product innovation and its firm performance is being tested. The estimated value of the path coefficient is 0.249, indicating a positive relationship between the two constructs, meaning that companies with better product innovation tend to have higher firm performance. The t-value (3.506) and p-value (0.000) indicate that this relationship is statistically significant.

MI (Market Innovation) -> FP (Firm Performance): The relationship between a company's market innovation and its firm performance is being tested. The estimated value of the path coefficient is 0.370, indicating a positive relationship between the two constructs, meaning that companies with better market innovation tend to have higher firm performance. The t-value (4.306) and p-value (0.000) indicate that this relationship is statistically significant.

**Table 4. Hypotheses Relationships**

Hypothesis	$\beta$	t-value	p-value	Decision
H1: MO -> IC	0.292	7.422	0.000	Accepted
H2: EO -> IC	0.321	5.783	0.000	Accepted
H3: CO -> IC	0.246	4.963	0.000	Accepted
H4: IC -> PrI	0.457	9.934	0.000	Accepted
H5: IC -> PI	0.663	20.304	0.000	Accepted
H6: IC -> MI	0.450	8.520	0.000	Accepted



Continued Table 4

Hypothesis	$\beta$	t-value	p-value	Decision
H7: PrI -> FP	0.208	4.068	0.000	Accepted
H8: PI -> FP	0.249	3.506	0.000	Accepted
H9: MI -> FP	0.370	4.306	0.000	Accepted
	<b>R<sup>2</sup></b>	<b>Q<sup>2</sup></b>		
IC	0.424	0.266		
PrI	0.209	0.117		
PI	0.440	0.278		
MI	0.202	0.129		
FP	0.460	0.232		

Sources: developed by the author.

From the data analysis table, it can be seen that all the relationships have been accepted with a p-value less than 0.05, meaning that they are statistically significant. The t-value of each relationship indicates that they are all significant as well, with values greater than 2. Additionally, the beta value also indicates that the strength of all the relationships is positive, in other words, all of the predictors (MO, EO, CO, IC) have positive correlation with their respective criterion variables (PI, MI, PrI, FP)

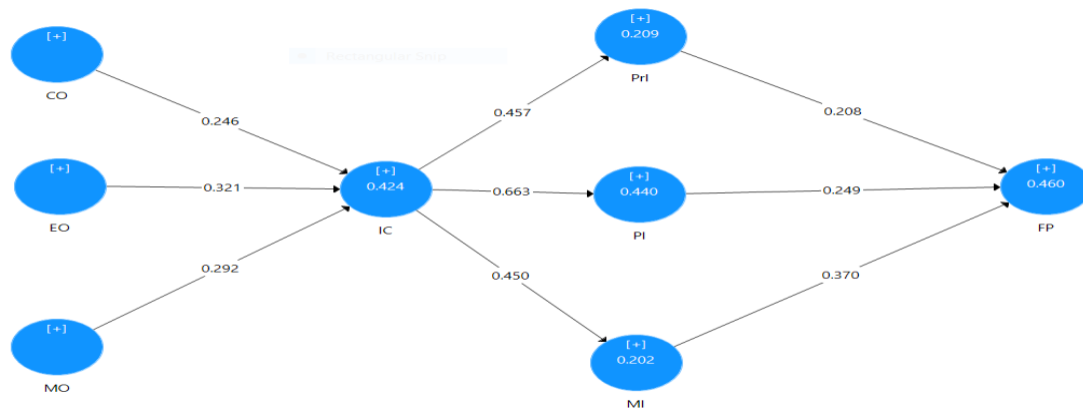


Figure 1. Patha Analysis of the Proposed Research Model with Path Coefficients

Sources: developed by the author.

**Mediation.** The summary of mediation analysis in Table 5 examined the relationships. The analysis looked at the effect of IC on PrI, PI, and MI, and then the effect of these three mediators on the outcome (FP). The beta values, standard deviations, t-values, and p-values are reported for each relationship. Overall, the analysis finds that there are significant relationships between IC and the final outcome (FP) for all three mediators (PrI, PI, MI). Additionally, there are significant relationships between (MO, EO, CO) and process innovation (PrI), product innovation (PI), and market innovation (MI) through the mediation of IC.

Table 5. Mediation Analysis

Relationship	$\beta$	S.D	t-value	p-value	Decision
MO -> IC -> PrI	0.133	0.136	5.428	0.027	Accepted
MO -> IC -> PI	0.194	0.196	5.427	0.039	Accepted
MO -> IC -> MI	0.131	0.132	4.885	0.030	Accepted
EO -> IC -> PrI	0.147	0.145	4.148	0.027	Accepted
EO -> IC -> PI	0.213	0.210	4.652	0.035	Accepted
EO -> IC -> MI	0.144	0.142	4.218	0.026	Accepted
CO -> IC -> PrI	0.112	0.117	5.339	0.025	Accepted
CO -> IC -> PI	0.163	0.169	6.086	0.022	Accepted
CO -> IC -> MI	0.110	0.114	5.648	0.026	Accepted
IC -> PrI -> FP	0.095	0.095	6.659	0.029	Accepted
IC -> PI -> FP	0.165	0.167	3.817	0.025	Accepted
IC -> MI -> FP	0.166	0.167	3.282	0.050	Accepted

Sources: developed by the author.

The «Path Coefficient» shows the strength of the relationship between the predictor variable MO and the outcome variables PrI, PI, and MI through the mediating variable IC. The  $\beta$ -values of 0.133, 0.194, and 0.131 suggest that the relationship between MO and PrI, PI, and MI is moderate. Similarly, The t-values of 5.428, 5.427, and 4.885 suggests that the relationship between MO and PrI, PI, and MI through the mediating variable IC is statistically significant. The values of 0.027, 0.039, and 0.030 in this column suggest that the probability of observing the t-values by chance is low. The moderate magnitude of the effect and the statistically significant relationship observed in this analysis provide support for the hypothesized (H10, H11, and H12) mediation model. It suggests that MO has a statistically significant effect on PrI, PI, and MI through the mediating variable IC.

The study also measured the strength of the relationship between the predictor variable EO and the outcome variables PrI, PI, and MI through the mediating variable IC. The  $\beta$ -values of 0.147, 0.213, and 0.144 suggest that the relationship between EO and PrI, PI, and MI is moderate. The t-values of 4.148, 4.652, and 4.218 in this column suggest that the relationship between EO and PrI, PI, and MI through the mediating variable IC is statistically significant. The p-values of 0.027, 0.035, and 0.026 in this column suggest that the probability of observing the t-values by chance is low. It indicates that the result supports (H13, H14, and H15) the relationship of the predictor variable EO to the outcome variables PrI, PI, and MI through the mediating variable IC.

Mediation analysis also suggests that the path coefficients for CO  $\rightarrow$  IC  $\rightarrow$  PrI, CO  $\rightarrow$  IC  $\rightarrow$  PI, CO  $\rightarrow$  IC  $\rightarrow$  MI are all significant ( $p < 0.05$ ) which means the indirect effect through IC is accepted (H16, H17, and H18) for all the dependent variables PrI, PI, MI. It means that there is evidence of a significant indirect effect of CO on PrI, PI, MI through IC.

Further analysis examined the relationship between three variables: IC (Independent Variable), PrI, PI and MI (Predictor Indicator), and FP (Final Predicted Variable). The path coefficient between IC and PrI is 0.095, between IC and PI is 0.165, and between IC and MI is 0.166, whereas the t-value between IC and PrI is 6.659, between IC and PI is 3.817, and between IC and MI is 3.282. If the p-value is less than the significance level (0.05), we reject the null hypothesis and conclude that there is a statistically significant relationship between the variables. So, H19, H20, and H21 of the models are accepted because the p-value is less than the significance level of 0.05.

**Discussion.** The aim of this study was to investigate the relationships between market orientation (MO), entrepreneurship orientation (EO), customer orientation (CO), innovative capability (IC), process innovation (PrI), product innovation (PI), market innovation (MI), and firm performance (FP). The findings of the study confirmed the positive relationships between these variables, providing valuable insights into the role of orientation, innovative capability, and innovation in driving firm performance.

The literature review highlighted the importance of market orientation in fostering innovative capability. The findings of this study supported the hypothesis that MO has a positive and significant relationship with IC. This finding is consistent with previous research (Cai et al., 2015; Kajalo and Lindblom, 2015; Narver and Slater, 1990; Ode and Ayavoo, 2020) and emphasizes the role of understanding and responding to customer needs in enhancing a firm's ability to generate and implement new ideas, products, and processes.

Similarly, H2 was also accepted as the study confirmed the positive relationship between EO and IC. The literature review indicated that companies with a strong EO tend to have a proactive, innovative, and adaptive culture that drives their ability to develop and implement new products, services, and processes (Ferreira et al., 2020; Sheng and Chien, 2016). The findings of this study align with these previous findings, highlighting the importance of an entrepreneurial mindset in fostering innovative capability.

The positive relationship between CO and IC, as hypothesized in H3, was also supported by the study findings. The literature review emphasized the significance of customer orientation in understanding customer needs and wants, which in turn leads to more successful new product development (Racela and Thourmrunroje, 2020; Sultana et al., 2022a; Wang et al., 2016). This study's findings reinforce the importance of a customer-focused approach in driving a firm's ability to innovate.

Furthermore, the study explored the relationships between IC and different types of innovation, including process innovation (PrI), product innovation (PI), and market innovation (MI). The positive relationships between IC and these types of innovation were supported by the study findings, confirming H4, H5, and H6. Previous research has also highlighted the role of innovation capability in driving various forms of innovation (Akman and Yilmaz, 2019; Koc and Ceylan, 2007; Xie et al., 2019). These findings highlight the importance of a strong innovative capability in enabling firms to introduce new or improved products, processes, and business models, thereby staying competitive in the market.

Lastly, the study investigated the relationships between PrI, PI, MI, and FP. The findings confirmed the positive relationships between these types of innovation and firm performance, supporting H7, H8, and H9. Previous research has also shown that companies engaging in process innovation, product innovation, and market innovation tend to have better firm performance in terms of productivity, financial performance, and market share (Karlsson and Tavassoli, 2015; Lee et al., 2019; Ramadani et al., 2019). These findings emphasize the role of innovation in driving firm performance and competitiveness.

The findings of the study suggest that innovation capability mediates the relationship between IC and firm performance (FP). These findings are consistent with previous studies that have highlighted the importance of innovation capability as a mediator between orientations, innovation types, and firm performance. For example, Huhtala et al. (2014) and Urgal et al. (2013) found positive effects of innovation capability on business performance and innovation performance, respectively. Additionally, the study by Mokhtar and Don (2014) demonstrated a strong relationship between knowledge management and innovation through innovation capability.

In the context of Pakistan, these findings suggest that companies in the country can benefit from investing in their innovative capability. Pakistan has a rapidly growing economy, and innovation and competitiveness have become crucial for its business sector to keep up with global trends. Therefore, the results of this study highlight the importance of innovative capability for firms operating in Pakistan, to improve their performance in terms of process, product, and market innovation. In order to improve innovative capability, companies in Pakistan can invest in market orientation, entrepreneurship orientation, and customer orientation, as these were found to have a positive impact on innovative capability. This highlights the importance of these variables in driving innovation and performance in IT companies in Pakistan. Additionally, they may also benefit from government initiatives in order to improve the innovation ecosystem in the country.

*Practical Implications.* IT Companies can use the findings of this research to identify the areas in which they need to improve their innovative capability to enhance their ability to innovate and improve performance. The study can help companies to understand how to align their business strategies, such as market orientation, entrepreneurship orientation, and customer orientation with innovative capability to achieve better results. The research results can also assist companies in determining which forms of innovation, such as process innovation, product innovation, and market innovation, will have the greatest impact on their performance and where to focus their resources. By understanding the link between innovative capability and firm performance, companies can improve their ability to introduce new products, services, and marketing practices that meet the needs of their customers. The research results can also be used by management consultants, innovation consultants, or business advisors, to help companies to improve their innovative capability, and ultimately, to increase their performance. The findings of this study can also be used as a tool to help practitioners and researchers in different industries and across different countries understand how they can align their business strategy with innovative capabilities to achieve better results. Finally, the research results can serve as a basis for future research in the field, providing a foundation for the development of new theoretical models and techniques for measuring and enhancing innovative capability.

**Conclusions.** This research study aimed to investigate the role of innovative capability in relation to process innovation, product innovation, and market innovation and how they lead to firm performance. The study was conducted on a sample of 316 employees from IT companies in Pakistan, using a structured questionnaire and convenience sampling technique. The findings of the study revealed that all the relationships between innovative capability and the different forms of innovation and firm performance were statistically significant, with a positive correlation between the predictors and the criterion variables.

These findings have important implications for practitioners and researchers in different industries and across different countries. They suggest that innovative capability can play a crucial role in driving process innovation, product innovation, market innovation, and ultimately, firm performance. This research can serve as a foundation for the development of new theoretical models and techniques for measuring and enhancing innovative capability and can help practitioners and researchers to align their business strategy with the innovative capability to achieve better results. The research results are valuable to Pakistan specifically, as they shed light on the importance of innovative capability for companies operating in the country, and can guide them in understanding how to improve their performance in terms of process, product, and market innovation.

However, it's important to note that these findings are based on the specific sample used in this particular study and more research would be needed with other control and moderating variables in the specific context

of Pakistan. Furthermore, the generalizability of these results may be limited, as this study might not have captured the entire population of IT firms operating in Pakistan.

**Conflicts of Interest:** The author declares no conflict of interest.

**Data Availability Statement:** The data that support the findings of this study are available from the corresponding author, [NA], upon reasonable request.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

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### **Розкриття потенціалу: вплив інноваційної спроможності на процес, продукт, ринкові інновації та ефективність діяльності компанії**

Це дослідження має на меті вивчити роль інноваційної спроможності щодо впровадження нових технологій у виробничих процесах, при створенні продуктових та ринкових інновацій, а також те, як вона впливає на ефективність діяльності компанії. Для цього дослідження вихідні дані сформовано на основі опитування працівників компаній-розробників програмного забезпечення в Лахорі, Пакистані. Структурований опитувальник розроблено на основі валідованих шкал. Всього було сформовано 54 питання для вимірювання 8 конструктів інноваційної спроможності (ринкова орієнтація, підприємницька орієнтація, клієнтоорієнтованість, інноваційна спроможність, процесна інновація, продуктова інновація, ринкова інновація та продуктивність фірми). Встановлено, що всі взаємозв'язки між конструктами мали статистичну значущість на рівні не менше 0.05. Т-значення для кожного взаємозв'язку є статичним і більшим за 2. Крім того, Т-значення також вказує на те, що сила всіх зв'язків є позитивною, тобто всі предиктори (МО, ЕО, СО, ІС) мають позитивні кореляції з відповідними критеріальними змінними (РІ, МІ, РrІ, FР). Загалом, результати медіаційного аналізу свідчать про статистично значущі зв'язки між інноваційною спроможністю (ІС) та кінцевим результатом (FР) через змінні-медіатори процесних інновацій (PгІ), продуктових інновацій (PІ) та ринкових інновацій (MІ). Результати цього дослідження можуть бути використані як інструмент, що допоможе бізнесу і дослідникам у різних галузях і країнах зрозуміти, як вони можуть узгодити свою бізнес-стратегію з інноваційною спроможністю для підвищення ефективності діяльності компанії. Крім того, результати аналізу можуть слугувати основою для майбутніх досліджень у цій галузі, забезпечуючи фундамент для розробки нових теоретичних моделей і методів вимірювання та розвитку інноваційної спроможності. Дослідження інноваційної спроможності та її впливу на продуктивність компанії, здатність створювати нові продукти та виходити на нові ринки може мати значний вплив на всі групи зацікавлених сторін, допомагаючи підприємствам бути більш конкурентоспроможними та ефективними, що призведе до їх економічного зростання та потенційно створить нові робочі місця.

**Ключові слова:** конкурентна перевага, конкурентне середовище, діяльність фірми, глобальні тенденції, інноваційна спроможність, ринкові інновації.